Ambulance Service 2030:

The Future of Paramedics

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Abstract

Some innovations are termed ‘disruptive’, a designation that is normally applied to technology; examples include computers, digital cameras, and mobile phones. The term can also be applied to groups of workers, particularly if they are able to offer specific technical capabilities within a market at lower cost, but broadly equal and effective to that offered by traditional products or services.

Paramedics could be described in this way and are a newly professionalised group, with distinctive capabilities in terms of responding to the needs of not just the acutely ill and injured, but increasingly those patients with undifferentiated non-life-threatening conditions, which increasingly make up the bulk of 999 call demand. The key to their transition from an artisan, skilled worker to professional status is the acquisition of certain ‘hallmarks’. Perhaps the most important of these is the completion of more prolonged education that affords the opportunity to graduate with enhanced decision-making and other clinical skills in order to meet the needs of the full spectrum of patients in the pre-hospital setting.

Paramedics were surveyed to determine how they rated their ‘traditional’ preparation and to establish what their attitudes were to a more educationally based approach. Paramedics themselves proved to be realistic regarding shortcomings in established training and education systems, while also being strongly motivated to learn more

within a higher education setting, particularly if this additional effort would result in being able to offer a wider range of care to their patients.

During the study, major changes in the health care environment and the role of the Ambulance Service took place, leading to a requirement to undertake a second phase of research. This took the form of 'Horizon Scanning' in an attempt to detect 'signals', themes and trends in relation to newly emerging 'competitors' to the paramedic role. These included nursing, new practitioners and most critically, the rapidly emerging medical sub-speciality of pre-hospital care, staffed by medical personnel on a pattern found specifically in some European countries, sometimes termed the 'Franco-German' model/System (FGM/S). Hitherto, the model of provision in the UK had followed the 'Anglo-American' model/System (AAM/S), approach, with paramedics providing direct patient care in the field and medical staff largely involved in medical oversight, teaching, clinical governance and other higher level roles.

As part of this research, the evidence base for change was examined and consideration given to the factors that might help clarify what the likely situation could be in 2030 in respect of ambulance services, pre-hospital care and paramedics. This future is uncertain, but factors have been identified that would militate in favour of one or other model prevailing, with close links established between educational preparation, system design, career structure and the continuance of the professionalisation process favouring paramedic progression. However, other factors, most specifically professional power, the absence of a clear

evidence base and an apparent reluctance to clearly acknowledge this in some respects, lead to the conclusion that the future of pre-hospital care remains uncertain and contested, but also potentially amenable to a well-directed influencing strategy.

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GLOSSARY

AAM/S	Anglo-American Model/System
ABC	Airway, Breathing and Circulation
ACA	Ambulance Care Assistant
ACEG	Ambulance Chief Executive Group
A&E	Accident and Emergency
AETAG	Ambulance Education Training Advisory Group
AfC	Agenda for Change
AHMAC	Australian Health Ministers' Advisory Council
AHP	Allied Health Profession
AHPA	Australian Health Professions Association
AIHW	Australian Institute of Health and Welfare
ALS	Advanced Life Support
AMPDS	Advanced Medical Priority Dispatch System
AMR	Advanced Medical Retrieval
A&P	Anatomy and Physiology
ARP	Air Raid Precautions
ASA	Ambulance Service Association
ASN	Ambulance Service Network
BASIC	British Association of Immediate Care
BEM	Black and Ethnic Minority

BHF	British Heart Foundation
BLS	Basic Life Support
BMA	British Medical Association
BMJ	British Medical Journal
BPA	British Paramedic Association
BSc	Batchelor of Science
CACFOA	Chief and Assistant Chief Fire Officers Association
CAOC	Chief Ambulance Officer Community
CCFP	Critical Care Flight Paramedic
CCHs	Critical Care Hospitals
CCPs	Critical Care Paramedics
CfWI	Centre for Workforce Intelligence
CHD	Coronary Heart Disease
CHs	Community Hospitals
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CONOPs	Concept of Operations
CoP	College of Paramedics
CPAP	Continuous Positive Airway Pressure
CPR	Cardiopulmonary Resuscitation
CPSM	Council of Professions Supplementary to Medicine
CRM	Crew Resource Management
CVD	Cardiovascular Disease
DCDC	(MOD) Development, Concepts and Doctrine Centre
DEFRA	Department of Environment, Food and Rural Affairs

DGHs	District General Hospitals
DH	Department of Health
DHEW	Department of Health Education and Welfare
DHSS	Department of Health and Social Security
EA	Emergency Authorities
ECP	Emergency Care Practitioner
ECA	Emergency Care Assistant
ECSW	Emergency Care Support Worker
EMD	Emergency Medical Dispatcher
EMS	Emergency Medical Services
EMSS	Emergency Medical Services Systems
EOC	Emergency Operations Centre
EMT	Emergency Medical Technician
ERFF	Environmental Research Funders' Forum
ESRC	Economic and Social Research Council
EU	European Union
EUSEM	European Society for Emergency Medicine
FGM/S	Franco-German Model/System
FLSM	Front Loaded Service Model
FPHC	Faculty of Pre-Hospital Care
FSEM	Faculty of Sport and Exercise Medicine
GDP	Gross Domestic Product
GMC	General Medical Council
GMS	General Medical Services

GP	General Practitioner
HART	Hazardous Area Response Team
HCP	Health Care Provider
HCPC	Health & Care Professions Council
HEADG	Higher Education Ambulance Development Group
HEMS	Helicopter Emergency Medical Service
HEFC	Higher Education Funding Council
HEI	Higher Education Institution
HPC	Health Professions Council
HTA	Health Technology Assessment
HTAI	Health Technology Assessment International
IAA	Independent Ambulance Association
IHCD	Institute for Health and Care Development
INA	International Network of Agencies
INAHTA	International Network of Agencies Health Technology Assessment
ISS	Injury Severity Score
ISTAHC	International Society of Technology Assessment in Health Care
IV	Intravenous
JRCALC	Joint Royal Colleges Ambulance Liaison Committee
LAPSP	Local Ambulance Paramedic Steering Panel
LAS	London Ambulance Service
LPSC	Local Paramedic Steering Committee
MA	Modernisation Agency
MAB	Metropolitan Asylums Board

MCAP	Medical Commission on Accident Prevention
MIERT	Mobile Incident Emergency Response Incident Teams,
MGHs	Major General Hospitals
MICA	Mobile Intensive Care Ambulance
MoD	Ministry of Defence
MI	Myocardial Infarction
NAO	National Audit Office
NATO	North Atlantic Treaty Organization
NBC	National Broadcasting Corporation
NHS	National Health Service
NHSME	National Health Service Management Executive
NHSP	NHS Pathways
NHSLA	National Health Service Legal Authority
NHSTD	National Health Service Training Directorate
NHTA	National Highways and Traffic Administration
NICE	National Institute for Clinical Excellence
NIHR	National Institute for Health Research
NNT	Numbers needed to Treat
NPM	New Public Management
NPSA	National Patient Safety Agency
NSF	National Service Framework
OECD	Organisation for Economic Co-operation and Development
OPEC	Organization of Petroleum Exporting Countries
PA	Physician Assistant

PAM	Professions Allied to Medicine
PCTA	Primary Care Trust Area
PEC	Practitioner in Emergency Care
PEEP	Paramedic Education Evidence Project
PESTLL	Political, environmental, social, technical, legal and legislative
PFI	Public Finance Initiative
PMETB	Postgraduate Medical Education Training Board
pPCI	primary Percutaneous Coronary Intervention
PTS	Patient Transport Service
QAA	Quality Assurance Agency
QIPP	Quality, Innovation, Productivity and Prevention
RAACS	Road Accident After Care Scheme
RAND	(Derivation of Research and Development) RAND Corporation
RCN	Royal College of Nursing
RAF	Royal Air Force
RSI	Rapid Sequence Induction (or anaesthesia)
RCT	Randomised control
SAMU	Service D'Aide Medicale Urgente
SaR	Search and Rescue
SCPE	Standards of Conduct, Performance and Ethics
SECAmb	South East Coast NHS Ambulance Foundation Trust
SET	Standards of Education and Training
SHA	Strategic Health Authority
SOPs	Standards of Proficiency

SPSS	Statistical Package for the Social Sciences
STEMI	ST Segment Elevation Myocardial Infarction
SIRI	Serious Incident Report Investigation
SUI	Serious Untoward Incident
SWOT	Strengths, Weakness, Opportunities [and] Treats [analysis]
UKCC	United Kingdom Central Council [Nursing]
UPR	University of Hertfordshire's Policies and Regulations
VF	Ventricular Fibrillation
VT	Ventricular Tachycardia
WHO	World Health Organisation
WWI	World War I
WWII	World War II

Chapter I

Introduction

I.1/ Theme of this Thesis

Goode (1960) stated “Industrialised societies are also professionalising societies” (p. 902) and nowhere is this phenomenon more obvious than in the advancement of Allied Health Professions (AHPs) during the last century. In 1970 there were no paramedics; the very notion of providing advanced clinical care outside hospitals, using non-physicians, although relatively common if sometimes rather ad hoc during military conflicts through the ages, had not been translated from the battlefield into civilian clinical practice in most countries.

There is no doubt that by 1970, despite growing interest in pre-hospital care and ambulance services, the country was lagging behind the best international examples of emergency medical and paramedic services. Many countries had well developed, medically led services. Austria represents a good example of this trend having developed comprehensive ambulance services to serve the urban areas as early as the late 19th century, due to the work of Jaromir Baron von Munday, whose work was summarised by Figl and Pelinka in Baskett and Baskett’s (2007) major text

Resuscitation Greats (p. 146). This model was later copied in Russia, Poland, Hungary and elsewhere (Machala 1981). By 1965, West Germany had also developed a large scale medically oriented system, again with a lineage stretching back to the work of Kirschner in the early 20th century, but taken forward by workers such as Gögler (1965) whose research attracted state support, arguably the Heidelberg system becoming one of the best known examples (Easton, 1977). France also adopted this medical approach in the 1960s, Giround (2012) terming the organisation: Service D'Aide Medicale Urgente (SAMU). These medically staffed models of ambulance service, or 'Emergency Medical Service', have come to be known as the 'Franco-German' model (FGM) approach [in a slight historical overstatement, given that France followed what was essentially an Austrian and German initiative] while those ambulance services delivered predominately by paramedics are frequently classified as the 'Anglo-American' model (AAM) (Kuehl 1994).

Today the situation is becoming more complex in the UK and to an extent elsewhere, with paramedics in many countries ostensibly well integrated into the national and international health care scene. In the case of the UK and South Africa, paramedics are now registered as allied health professionals. Nevertheless, controversies remain unresolved. In the last ten to fifteen years, at precisely the moment when the most rapid professional advances for AHPs have occurred, particularly for paramedics, an element of instability and precariousness has become apparent. This is due largely to the role of paramedic or more specifically, the discipline of pre-hospital care becoming coveted by other professional groups, particularly elements

of the medical profession, who have ‘discovered’ physician-led systems and who seek to introduce them. This is despite developments within the paramedic profession in the UK to meet this area of patient need over the last four decades. Evidence as to which of the two models might be superior in terms of the all important matter of patient outcome is inconclusive, but work to resolve this ambiguity continues, with almost feverish intensity in the medical literature. Thus, the debate about whether doctors or paramedics will prevail is open to arguments over professional demarcation, scope of practice considerations, cost and other influencing factors.

Paramedics in the UK and elsewhere are still attempting to accommodate the transition to professional status with a workforce that, for the most part, has been prepared through a vocational training model, while also responding to meet new health care demands with wider clinical responsibilities. This transition, while not unprecedented, when considering the emergence of other allied health professional groups, brings with it, in the UK context at least, some unique challenges, particularly the need to acclimatise to the associated politics that come with the move to professional status. This metamorphosis carries with it great potential benefits, risks and a surprising degree of uncertainty.

The theme of this thesis is therefore to chart the rise of a new professional group of health care providers (HCPs), i.e. paramedics. It considers the pressures that led to their emergence in health care provision, the antecedents over several hundreds of years and later, in the latter half of the 20th century, the much more rapid movement

to the centre ground of health care, combined with a shift from skilled manual worker to professional clinician. One key focus of this study is the role of education in effecting this transition and the opinions of the ambulance staff themselves; what this means to them individually and what strengths and limitations they feel are associated with traditional training models.

These and other recent changes will be considered and some extrapolations using horizon-scanning techniques will be integrated to help establish what key variables are likely to influence the course of development of the paramedic profession over the next two decades and what scenarios might develop. Ultimately, the outcome of this work may help this fledgling profession to continue to develop to reach its potential in circumstances where the very territory on which it stands becomes ever more contested and the future, less certain.

I.2/ Background, Motivation and Rationale

This project emerged from a desire to understand the process of transformation of an occupational group of workers, i.e. ambulance staff, to track their progress to the point at which a proportion of them (the paramedics) became subject to professional registration and beyond. Ambulance technicians remain unregulated. This group represented almost 50% of the UK ambulance services' clinical workforce when this project started, but this has now fallen to 28%, with an additional 4% of 'trainee' technicians and 3% sub-technician Emergency Care Support Worker (ECSWs) in

2012 (NHS Workforce Statistics 2013). Although the NHS 'Foster' report (UK Department for Education 2005) did open a debate as to whether 'support workers' should be considered for regulation, the recent Health and Social Care Bill, part 7 (2011) makes similar suggestions, but no concrete plans exist in this area at the present time.

It is this identified need to offer ambulance staff themselves a 'voice' and to provide an opportunity for them to put forward their opinions both as to their [then] current training and regarding the likely pattern of future, more educationally oriented education that has shaped the research question. A question that, while defined later in the chapter, is essentially summarised as being 'do ambulance staff consider their existing training is adequate and what are its strengths and weaknesses?'

Secondly, what do they regard as the most appropriate form of their future education and should this be more academically based and, if so, at what level? These research questions will seek answers regarding the form of educational preparation for the role of both paramedics and, to a lesser extent, support worker roles such as the ambulance technician.

These are fundamental questions, which hitherto have been largely the province of employers, regulators and others, such as the medical profession, exhibiting a range of behaviours from what might be characterised as the professionally disinterested through to, in some cases and to the less charitably minded, a self-absorbed/interested manner. Employers and employees, together with regulators, Professional Bodies and others would not normally be expected to necessarily

completely agree with one another, but the situation in respect of ambulance staff, as will be articulated later, is not akin to that found in more mature occupations and professions. There are, as will be demonstrated, inequalities in power, something which is, to some extent, inevitable in any newly-forming profession. However, when combined with other factors, such as a target driven public sector organisation (Wankhade, 2012), where most ambulance staff are employed, this may act to retard processes of professionalisation.

In order to answer these questions a variety of methods were considered and these will be mentioned briefly in this section and explored further in later chapters. Ultimately a questionnaire-based approach was employed for the first phase of this study. The choice of this method was influenced by a need to include a large number of participants and to address logistical challenges associated with accessing a largely disaggregated workforce operating across the United Kingdom, including, for completeness, the devolved countries of Scotland and Wales, and the province of Northern Ireland. While this approach, which required the production of 3000 questionnaires, distributed to 34 Ambulance Services, did involve costs, these were more constrained than alternative methodologies such as focus groups. The use of an online survey was briefly considered but rejected due to concerns over the IT literacy of potential respondents. The choices that were made in respect of this and other aspects of the research process will be considered later in this thesis. As with any research process a degree of adaptation and reflexivity was required, features of which are discussed in later sections.

The ‘emergency’ focussed nature of clinical practice in ambulance services and the consequent legacy training methods, coupled with an increasing recognition of the unfolding and emergent nature of the research, led to the need to undertake a secondary phase of research to determine how the newly developed and now regulated ‘paramedic’ profession, might fare in a more professionally contested environment. The process of regulation coincided with the developing role of the paramedic and greater media visibility appeared to have acted in a manner which made the area of practice that paramedics were responding to more attractive to other professional groups.

An important secondary objective is to chart the even more marked changes that occurred in the immediate post-registration period, particularly in terms of the enforced but inevitable and, indeed for many, welcome move from a training-based model of preparation to one in which higher education became a cornerstone of professional preparation. Little has been written about this professional journey and there is even less information as to how ambulance services, as the employing organisations, can achieve this major workforce transition by developing facilitative/effective strategies and policies.

However, looking back over the gestation of this research, it is now clear that a number of key factors were unappreciated at the ‘progression’ stage. This provided an important opportunity for reappraisal and a refocusing of the study’s aim and objectives which resulted in a change of emphasis that led to a more ‘future oriented’

approach to the research. The reality is that the act of 'professionalising' an occupational group is also a social process and one that can become susceptible to the law of unintended consequences. At the point of this project's inception, the future for paramedics appeared clear, positive and relatively uncontested. However, that time has now passed and with it has gone the notion of naïve optimism.

Developments, exemplified in the *High Quality Care for All: NHS Next Stage Review (Final Report)* (Lord Darzi of Denham KBE 2008) and the companion document, *A High Quality Workforce*, which removes paramedics from the AHP career structure and substitutes an alternate, less attractive and more limited range of career options, provide an example of emerging challenges. There have also been some contested and as yet, unresolved disagreements between the medical and paramedic professions regarding paramedic scope of practice, particularly in respect of airway management. These developments, the results and effects of which are unclear, could risk the 'de-skilling' of paramedics and may also risk tensions with those in the medical profession who support such constraints on paramedic practice and propose more medico-centric service models. These developments herald something of a 'sea change' to a more hostile environment in which paramedics must establish and expand their role to take account of the changing complexities of patients' needs and desires, and also position themselves effectively with reference to the interests of other professional groups who claim access to the same professional territory.

The current circumstances are further complicated as a result of uncertainty in relation to the future of the Ambulance Service as a whole, which went through a

major consolidation in 2006, resulting in a reduction to 11 regional services, and now faces the prospect of yet another round of organisational change. A further reduction occurred in 2012 when the number of 'trusts' fell to 10, with the merging of the South West and Great Western Trusts. These organisational changes are taking place in the context of perhaps even more profound amendments to the legal status of trusts, exemplified by the move to Foundation Trust status, (which may yet metamorphose into alternate organisational forms). The implementation of the FT programme has continued under the stewardship of the current Alliance Government and was highlighted in the former Secretary of State's opening address at the June 2010 NHS Confederation Conference.

The parallel development of pre-hospital care becoming a new area of medical interest, with sub speciality status being sought by an inter-collegiate board through the means of an application to the General Medical Council (GMC), who approved the development in 2011, raises many interesting points. The first cohort of medical trainees commenced their sub speciality training in August 2012 and the appointment of two Medical Consultants in Pre-hospital Care within the East Anglia region prior to anyone qualifying in this sub-specialty, is a noteworthy development. It is also somewhat estranged from the local Ambulance Service, in the sense that the appointments have been made within the acute sector [hospital].

This expansion of medical involvement may result in a diminution of the paramedic role and could have widespread consequences for the status of what is still a small fledgling profession. It is also likely to require higher levels of new funding or a

transfer of funds from other health care activities at a time of reducing expenditure within the National Health Service. However, it would not be reasonable to disregard the role and legitimacy of other professions who seek to enter the occupational space currently filled by ambulance staff and paramedics in particular. There are a number of health care professionals including the well-established medical and nursing professions as well as newer emerging options, and these must be considered (with particular regard to any evidence as to superiority) most importantly in relation to patient outcomes.

Thirteen years ago in a somewhat different era, recognition of paramedics as health professionals and associated registration was in the final stage of preparation and there were grounds for optimism. Sir Kenneth Calman, a former Chief Medical Officer for the NHS, writing a foreword to *The Future of Ambulance Services in the United Kingdom* (Nicholl, Turner and Martin, 2000) recognised the potential of a professionalised paramedic work force and stated that paramedics had "failed to benefit from the expansion of opportunities in higher education", (Foreword p. 2) readily embraced by other health care professionals. This recognition gradually stimulated a response, from both central government and among individual ambulance services, some of which formed partnerships with Higher Education Institutions (HEIs). Within a year of these comments the Joint Royal Colleges Ambulance Liaison Committee (JRCALC) published a consultation document, *'The Future Role and Education of Paramedic Ambulance Personnel (Emerging Concepts)'* (Chamberlain 2000) that encouraged the development of a 'Paramedic Practitioner' grade or 'Practitioner in Emergency Care' (PEC). This meant that a

paramedic would receive graduate level preparation for their role, although by this date one BSc honours programme had already been established in England at the University of Hertfordshire (Donaghy 2008).

Academic interest has also been an important driving force for change, with the need to provide credible educational programmes for paramedics strongly endorsed by academics such as Jones and Cookson (2000) who recognised that a more comprehensive educational experience for paramedics was desirable with a move away from protocol-directed care. However, a common form of preparation for ambulance crews is nearly identical in duration, and similar in content, at least at the Ambulance Technician level, to the original recommendations of the Millar report (1966), Working Party, Ministry of Health, (1966 & 1967). Although technician training has, in many cases, been replaced by an even shorter, technician derivative termed an Emergency Care Support Worker (ECSW) grade in some ambulance services, operating at level 3 of the NHS career framework [and the Agenda for Change (AfC), pay scales]. The technician grade generally operates at level 4 of the career framework and of AfC.

Paramedic training was developed in the UK during 1971, but not standardised until 1986 and was, until recently, approximately 300 hours in duration, divided into modules covering specific themes, ‘G’, [(A&P)] ‘H’, resuscitation and trauma management skills, ‘I’-1, paediatrics and ‘I’-2 obstetrics and at least one month of clinical placements (see VI). Despite some relatively recent changes such as the addition of a further module ‘J’, dealing with ‘professional issues’, little has changed

to this essentially ‘training’ focused package, which, although in decline, remains in use by some ‘trusts’. This traditional format is still not comparable with the preparation provided to other health care professions that are regulated by the Health and Care Professions Council (HCPC). It was therefore understandably described in the JRCALC submission as being “relatively modest”. Interestingly, the Council of Europe document, *Comparative Study of the Organisation and Functioning of Emergency Medical Assistance Services* (1990) (Council of Europe, European Health Committee) found that the training of most ambulance personnel in Europe usually lasts about 500 hours.

Few European countries, which in general tend to utilise the more medico-centric FGM model of ambulance staffing, in which doctors play a much more active role in pre-hospital care, assign paramedic personnel the level of clinical responsibilities found in the UK and in North American. Even fewer have developed independent professional registration for paramedics in the way that has occurred in Britain and slightly earlier in South Africa during the late 1980s. Similar regulatory legislation for paramedics is being planned for New Zealand, possibly by 2014, as reported by Paramedics Australasia (the representative body for paramedics in Australia and New Zealand). The Australian Health Ministers’ Advisory Council’s (AHMAC) Health Workforce Principal Committee, July 2012, is exploring the role of Federal or more likely state level registration for Australian paramedics, but no firm date has been agreed at this time. In some ways this is something of a paradox given that both Australia and New Zealand already have paramedics working with an advanced scope of practice and a high degree of autonomy.

Currently, despite the availability of at least 10 undergraduate paramedic programmes across Australia (Morrison, 2011), the Australian Institute of Health and Welfare (AIHW) classifies paramedics as 'miscellaneous health workers'. Paramedics have not, therefore, been granted membership to the Australian Health Professions Association (AHPA). In the UK, paramedic registration has been a factor in accelerating the move from training to education and it is certainly the case that the bureaucratic architecture that inevitably accompanies the process of registration has required the development of specific standards for paramedics. This is promulgated in the HCPC's *Standards of Proficiency* (2007), the College of Paramedics' (CoP) *Curriculum Framework* (2006), revised in (2008), and the Quality Assurance Agency's (QAA), *Subject Benchmark Statement* (Sept 2004), all of which have helped to create driving forces for evolutionary development.

Yet today these changes, which militate in favour of a more professional status are proving to be a 'double-edged sword' creating potential tensions with the medical profession who, prior to the registration, had a large measure of control over all ambulance staff, certainly in terms of their clinical scope of practice. The proposal from the JRCALC Airway Management Working Group (2008) which recommended the withdrawal of the well-established paramedic skill of endotracheal intubation and the paramedic profession's feisty response in terms of the CoPs' *Position Statement*, (2008) on the matter, is but one example of inter-professional differences of opinion. This was a relatively rare public manifestation of the anxieties of some within the medical profession about the role of paramedics.

Against this backdrop there has been very little research into the view of ambulance crews themselves, with some limited exceptions such as Jones, Slater and Griffiths (2000) who have explored the 'experiences of paramedic students in higher education'. Some research has been conducted in the United States and Australia and will be considered but, as Margolis (2007) has pointed out, there is still a significant lack of consistency between programmes even within individual countries. International comparisons are possible, but should be viewed with a degree of caution.

It should be noted that the programmes themselves are changing. The emphasis upon purely life-threatening conditions and protocol-based care is gradually giving way to more cognitive and conventional educationally valid models of delivery in the higher education sector. This is noted by a US based 'educational taskforce', which developed the Emergency Medical Services', *Education Agenda for the Future: A Systems Based Approach*, published by the US National Highways and Traffic Administration. Similar patterns of change have been discerned by Lowery and Stokes (2007) across the English speaking world's Emergency Medical Services educational programmes. The nature of paramedic practice itself is also morphing to reflect the increasing recognition that much of the demand faced by paramedics is actually more 'undifferentiated urgent care' clinical presentations than heroic resuscitation or critical care-oriented emergency calls. The need for a change in the concept of operation for ambulance services is a key finding and theme of this research.

It could be argued that ambulance staff, as a group, have been far less involved in discussion regarding their education or scope of practice than might have been expected, particularly in comparison to other health care workers. They appear to have been 'swept up' in the general move of health-related groups, including nursing, AHPs, including audiology/hearing aid dispensers and social workers [although social workers were previously professionally registered], who are now registered with the HCPC and others in regard to the general increase in education participation, often at degree level. The National Audit Office (NAO), (2007) reported that this now affects 43% of the NHS workforce.

Similar claims of relative disengagement or at least a lack of participation, could be made regarding the transition to professional regulation, which was largely employer led, in contrast to the more usual practice, which would involve like-minded individuals coming together in the form of a professional body and seeking registration on the merits of the case. In any event, the British Paramedic Association (BPA), the professional body for paramedics, later to become the CoP, was formed only after the process of regulation was complete.

One of the two key areas that this research project seeks to address is, therefore, the journey from an artisan group of trained, but unregulated workers to the gradual embracing of educational approaches and the move to university-based preparation. The adoption of higher education is generally part of the process of professionalisation and is particularly relevant in the case of paramedics, whose origins and preparation, were until relatively recently, firmly rooted in a very practical

and relatively basic first aid approach, with training conducted outside recognised educational establishments. These antecedents are very different from the other groups that are considered in more detail later in the study. Both doctors and nurses have long established educational and professional backgrounds, although little of this preparation is geared to 'pre-hospital' care as part of an organised emergency response.

One example of how this research may have played a small role in the many recent changes is the development of a position paper on behalf of the Ambulance Service Association (ASA), the ambulance employers' former membership body and principal stakeholder, now merged into the NHS Confederation and renamed the Ambulance Service Network (ASN). The ASA's structure involved a series of committees including one dealing with education and training: the Ambulance Education Training Advisory Group (AETAG). This group commissioned a position paper detailing the then current [1995] state of play in terms of ambulance service education and training and setting out the likely future direction of travel in a series of recommendations. This discussion paper is reproduced in Appendix II and has proved to be prescient. A more recent development in March 2012 involved the CoP negotiating the submission of letters to the then Health Professions Council (HPC) (now known as the HCPC), supporting a move for all paramedic education to be delivered at a minimum of Foundation Degree/Diploma level. This letter is reproduced at Appendix V. There is little doubt that this work has already proven influential, both in terms of the wider educational agenda and in relation to the development of the research discussed within this thesis.

In order to achieve more effective progression it became necessary to take the opportunity to both explore issues such as the professionalisation process i.e. the role of education, the views of staff themselves and to take a more imaginative journey into the possible alternate futures for the paramedic profession and, to an extent, the Ambulance Service. In order to accomplish this, a second phase of this thesis utilises techniques drawn from the world of Strategic Foresight studies and considers paramedics as one of a range of options for the future staffing of a pre-hospital response considered within the context of the available evidence.

The purpose of this approach is to draw upon the two distinct phases of the research, with the first being devoted to the views of respondents themselves, with a particular emphasis upon how they consider the role of education and how this underpins their practice in the future. The second phase facilitated through the use of techniques such as Horizon Scanning, the attempt to determine the prospects of paramedics as they contend with the increasing complexities associated with both their developing role and competition by other professional groups to undertake this work, poses the question: Who ultimately is likely to be the best adapted, most cost-effective and most successful in seizing the future? The ultimate purpose being to provide an opportunity to utilise any insight gained to help develop a more effective strategic response enabling paramedics, both individually and collectively, to navigate through the professional journey in the early 21st century more successfully.

I.3/ Research Question, Aims and Objectives

This study has undergone significant revision and change of emphasis during its gestation. Initially, it was conceived to attempt to answer the question of ambulance staff engagement, trying to determine to what extent ambulance technicians and paramedics were comfortable with their training, to what degree they felt that it needed to be developed, and to an extent replaced with academically accredited, ultimately degree-bearing qualifications. In some respects, therefore, the questions being asked centred on the satisfaction or dissatisfaction staff felt about their preparation to work as ambulance crews, at both technician and paramedic level. This resulted in the following research aim:

- Research Aim: To investigate the views and opinions of ambulance technicians and paramedics regarding their preparation for role, with emphasis upon current and future training issues.

  The specific objectives derived from this aim therefore become:

  - To examine whether paramedics and ambulance technicians consider that their training has adequately prepared them for their role.

  - To identify what level of academic award, if any, is considered to be most appropriate for the roles of ambulance technician and paramedic.

At the time of progression, this objective and the associated sub-objectives were subjected to close scrutiny and the environment in which the study was being conducted was discussed with supervisors at length.

It became increasingly apparent that the world of health care, the Ambulance Service and paramedics were changing rapidly. The technician grade was being phased out and replaced, while the number of educational programmes leading to either a Foundation Degree or, to a much lesser extent, a BSc was increasing. The older forms of preparation paramedic 'training', was still continuing and the tensions between training and educational approaches, employers, regulators and the professional body for paramedics were becoming evident.

More importantly, the spectre of competition, not just commercial competition for the delivery of ambulance services, hitherto virtually unknown, was becoming commonplace. A much more impactful development, direct competition for the role of the paramedic was becoming evident. Competition was emerging from 'new practitioners', as well as from nursing and medical staff. As a result, it appeared necessary to attempt to determine what the reality of the situation was and to what extent paramedics were able to flourish and continue to develop in this area.

To answer this question it was necessary to conduct a second phase of the study to explore more deeply the notion of paramedics as a developing group of allied health professionals. Consequently, consideration is given to the relationship between education, the attitude of staff towards their training and developing educational models, and the preparation of paramedics, and an examination as to how this

accepted ‘hallmark’ of a ‘professional’ was likely to develop. The relationship between education and the paramedic profession took on a new importance.

In order to accomplish these and other related aims and objectives it was decided that a ‘Horizon Scanning’ approach could be employed. This approach would seek to detect the ‘signals’ emanating from the ‘space’ around the paramedic profession, with the intent to carry out an appraisal as to the relative value of paramedics in relation to the merits and demerits of other professions. In doing so, the paramedic is conceived within this frame of reference as a ‘new technology’ or, as will be described as a ‘disruptive’ technology.

To explore these concepts, the Horizon Scanning describes paramedics in these terms in order to make an assessment as to their strengths and weaknesses in as objective a manner as possible. The discussion section seeks to integrate the wider argument in relation to whether paramedics are the most suitable technology to deploy in the pre-hospital or out-of-hospital setting.

The distinction between pre-hospital and out-of-hospital is important in that the widely used term ‘pre-hospital’ implies that all patients will be transported to a hospital facility, whereas the ‘out-of-hospital’ term more correctly reflects the increasing likelihood of patients being treated and released at the scene or referred to health services other than the traditional Accident and Emergency (A&E) unit.

This thesis will draw upon the available evidence base, economic considerations and political factors, all of which are examined within an historical frame of reference. In

order to accomplish this, the alternative workforce options, medical, nursing and 'new practitioners' had to be considered and explored in terms of the evidence as to their relative suitability for work in the pre-hospital and out-of-hospital emergency provider role.

As the need for a second phase to this study became apparent, the following research aim emerged:

- Research Aim: To evaluate each of four potential workforce options as if they were new or competing technologies using Horizon Scanning techniques.

  The specific objectives derived from this aim therefore become:

  - To identify strengths and limitations of each of the four workforce options;

  - To determine workforce numbers in each of these groups currently and the likely rates of growth;

  - To establish the most likely workforce option for 2030.

The intended outcomes of the above objectives also seek to establish three scenarios, drawn from the Horizon Scanning process, covering **'possible'**, **'probable'** and **'preferable'** futures. It will also attempt to identify what factors might increase the probability of the more successful 'preferable' future, in what is emerging as an ever more austere and increasingly hostile, contested environment.

I.4/ Original Aspects and Approach to the Research

This research represents new territory, not specifically or systematically addressed in respect to paramedics in the UK. It included an attempt to conduct a large survey of ambulance staff in order to determine their view as to the appropriateness of future academic levels for programmes and then to proceed to address the question “what is the most likely workforce option [paramedic or other health professional] that will be undertaking the ‘paramedic role’ in the Ambulance Service by 2030?”

It then proceeds to undertake a unique appraisal of the literature, initially with reference to foresight studies, including consideration of health technology assessment and Horizon Scanning and later, taking an historical chronological approach. This format is designed to give both an introduction to why the methodologies were chosen and how they developed, including providing an explanation as to why two distinct pieces of research proved to be required and how they relate to one another. It seeks to offer something of an historical context, detailing the emergence of paramedics as a new group of professional HCPs. In addition, it gives an introduction to some of the evolutionary pressures that have shaped the development of ambulance staff, principally paramedics among them and the close linkage with the Ambulance Service in what could be considered almost a symbiotic relationship.

In terms of general structure, which will be discussed in more detail in later sections, the questionnaire-based survey of ambulance staff could be considered Phase A. After which, and as a result of an emerging theme, a rapidly changing environment and advice from supervisors, a second stage, based on an Horizon Scanning approach was added, becoming Phase B. Horizon Scanning methodologies were selected in order to help identify signals that can help provide an indication of the likely future threats and opportunities that face the fledgling profession and to assist in determining how other groups were progressing in relation to their developing pre-hospital role. The two sections are brought together in the discussion.

Finally, within the conclusion, a number of emerging topics derived from the study seek to identify the key factors or strategic control points, which might potentially be adjusted or influenced to move the new paramedic profession to what, in Horizon Scanning parlance, is termed a 'preferable future'. If successful, it might assist the profession and, more importantly, advance the ultimate and overriding objective of improving the direct patient-care services at an affordable cost, thereby helping to ensure that paramedics become more effective in meeting future patient care needs.

I.5/ Summary

This project was conceived in 2000, the same year that Paramedics became professionally registered and only 30 years after the development of the first pilot paramedic schemes in the United Kingdom. The UK experience developed the role

of Paramedics within the AAM whereby ambulance staff/paramedics provide almost all-clinical care, although this approach often usually involves medical oversight. The alternative approach is the FGM, which involves doctors providing much of the care working in ambulances. The study had the original intention of seeking to establish the extent to which ambulance technicians and paramedics were satisfied with their training and preparation for their role, while also exploring to what extent they felt that a move to more educationally based programmes should be embraced in the future.

Events moved rapidly with the role of the paramedic attracting significant interest from other groups of health care workers, most notably doctors and nurses, but also from what could be termed “new practitioners”, essentially staff operating in practitioner roles, as part of a number of NHS initiatives to develop new grades of clinical staff. Elements within each of the above groups promoted the idea of paramedics being replaced or augmented by these competing professions. Some within the medical profession advocate for the UK to move from an AAM to a FGM type system. A second phase to the study was, therefore, developed utilising a Horizon Scanning approach, with the purpose of seeking to determine the likely impact and trajectory of these developments, with reference to the evidence base and other considerations, such as the economic and other social factors that will determine whether paramedics or other health professionals will be carrying out the role that is today associated primarily with NHS ambulance paramedics.

It is also important to acknowledge that there was also a strong desire and motivation to seek to understand the process of transformation of paramedics from their relatively humble origins as semi-skilled ambulance workers through their journey to professional requisition. Accompanying this aspiration was a growing interest as to what the future might hold and to what extent the paramedic profession itself might be able to influence its own destiny positively. Answering this question is dependent upon techniques drawn from strategic foresight studies.

Chapter II

Strategic Foresight & Horizon Scanning

Throughout the centuries, oracles, visionaries, soothsayers, fortune-tellers and, more recently, professional futurologists, have been in demand. The techniques available to these and other practitioners have moved on a little from the Roman predilection of butchering a goat and examining its entrails, tarot cards and palm reading. The 18th century use of reconnaissance balloons to satisfy the military wish to see, as General Lord Wellington desired, 'over the hill', in an effort to predict an opponent's next move, remains a military priority, although superceded by more complex technology.

Today there are many new approaches, grounded to one degree or another in academia and science, all promising to provide insight to a customer with the irresistible promise of strategic, commercial, military or other advantage. What is perhaps more surprising is that on occasion, and with a slightly greater reliability than chance, some of these methods do appear to deliver on the seemingly impossible goal of providing useful information that is otherwise out of reach.

Horizon Scanning is one of the more recent methods that falls under the general designation of 'foresight studies'. The Oxford English Dictionary (2013) defines 'foresight' as, '**noun 1** ability to predict the future. **2** the application of care and attention to the likely outcome of something or to future needs. **3** the front sight of a gun'. Some authorities suggest that 'scientific' interest into futures or foresight studies can be traced to the age of enlightenment from circa 1600 and more specifically Newton's Principia Mathematical (1687). However, the precise origins are difficult to define and early meaning appears to relate to 'scriptural futurist'. Later usage of the term relates more to authors writing in a visionary style including, Thomas More's *Utopia* (1516), or Louis-Sébastien Mercier, *The year 2440*, published in 1771.

Early 20th century 'prophets' include Jules Verne and Edward Bellamy and these authorities arguably most closely matched the contemporary use of the term: 'futurist'. H. G. Wells is the best known in the UK at least and indeed, it was Wells, who in a 1932 BBC radio interview called for the establishment of academic chairs of 'Foresight'. Although widely known for his novels, he also produced texts conceived with a view to foretelling many technological developments such as *Anticipations* (1904) and shortly thereafter, *Discovery of the Future* (1913). Prior to World War II (WWII), his prophetic novel, *The Shape of Things to Come* (1933), was turned into a highly popular motion picture, *Things to Come*, dealing with social, political and technological change during the period 1936 to 2036 and set in a fictional English 'every town'. He is therefore, logically regarded as the father of futurology.

During and immediately after WWII, interest in strategic foresight, now understood to involve using methods to extrapolate technological, social and economic trends, began to take on a much more academic tone, but not yet a fully accepted one. One of the catalysts for this development was the work of General Hap Arnold and a United States Air Force scientific advisor, Theodore von Kármán, who led the Towards Tomorrow, Air Force study. Almost immediately thereafter the first 'think tank' termed 'a systematic futures tank' was created at the RAND Corporation using finance secured by General Arnold, primarily for military use. The techniques produced by the group responsible for running this new strategic planning unit include well-known methods widely used today, such as 'scenario analysis' and 'prospective systems analysis'.

The emergence of foresight or 'Futures' as a distinct academic discipline occurred during the late 1960s and 1970s with the term 'Futurology' coined by Flechtheim (1943) in his book 'Ideology' and 'Utopia'. In the United States the discipline was informed by systems analysis, whereas elsewhere other influences predominated such as political planning in France and in the Soviet Union as it was known at that time. Large commercial organisations such as Royal Dutch Shell have made extensive investments in scenario planning, and Microsoft have a well-developed unit dedicated to building strategic advantage in Information Technology. The popularisation of these methods has received a good deal of attention through the work of writers such as Bertrand de Jouvenel's *The Art of Conjecture*, Dennis Gabor's *Inventing the Future* (1964) and Alvin Toffler's *Future Shock* (1971). More

recently, *Futures Studies*, linked to the prospect of accelerating and shaping change, has entered mainstream academia.

Conventional research options are relatively ineffective and unhelpful in resolving these ambiguities in these uncertain times. But new methods drawn from the world of 'Strategic Foresight' studies, using techniques such as 'scenario planning' or 'scenario analysis' and 'prospective systems analyses', originally developed by the RAND corporation and others in the 1950s for the US military, Lindgren and Bandhold (2003), seem to hold promise. The term 'foresight', credited to H.G. Wells, is derived from 'Futurology' or 'Futures' which are broadly defined by Jackson (2011) as 'the art and practice of postulating the possible, probable and preferable future'. Today an extensive range of potential tools is available to help in the task of discerning future conditions. These include such methods as environmental and scenario planning, systems engineering, simulation, modelling, failure modes effects analysis, and 'future history'.

II.1/ Scenario planning

While not the primary focus of this thesis, scenario planning will play a role in the final section of this research project when future alternatives will be considered. As described in the previous section, scenario planning was one of the early methods to evolve into what has now become the 'future studies' movement. The physicist, later 'futurist' Herman Kahn, according to Cornish (2005), a strong contender for inspiring

the Stanley Kubrick's 'Dr Strangelove' character in the 1964 film classic, was the prime mover in developing this approach.

The use of the term 'scenario' in its 'scenario planning' incarnation is also attributed to the Hollywood screenwriter Leo Roster who was approached by Kahn during the early development of the method. Scenario planning rapidly became associated with the United States military, coming to prominence during a time of cold war tensions when a nuclear exchange between the two principal military powers was all too feasible and planning for such an event was an everyday reality for the American government. Kahn popularised the approach in 1962, in his book *Thinking the Unthinkable: Scenarios and Metaphors*.

During the 1960s, more widespread civilian and commercial application followed as planners and researchers discovered that modelling could be enhanced using the method. Key workers in the field at this time included the French academic Berger (1964) and Godet and Roubelat (1970) who applied the method 'la prospective'. The relationship with developing commercial strategic advantage became more widely accepted. The most widely recognised worker in the non-military field is the late Pierre Wack of Royal Dutch Shell's group planning unit, who is credited with bringing scenario planning to prominence to more clearly illustrate the effect of a rise in oil price demanded by the Organization of Petroleum Exporting Countries (OPEC) immediately after the 1967 Arab Israeli 'six day' war.

Political and industry leaders were in little doubt that a rise in price was a likely outcome, but only Shell developed scenarios that fully considered the downstream

effects, including a significant rise in oil price, low industry and Organisation for Economic Co-operation and Development (OECD) growth, loss of control of company oil fields and other collateral effects. By planning to respond in advance to these changes, Shell positioned itself to become the most profitable oil company and dramatically increased its size and influence (Daum, 2008).

Wack (1984) has defined scenario planning as "… a discipline for rediscovering the original entrepreneurial power of creative foresight in contexts of accelerated change, greater complexity, and genuine uncertainty" (p.2).

This definition emphasises the resultant competitive advantage that can derive from a well-conceived exercise in the application of 'foresight' methods. At its simplest level, scenario planning develops a series of potential outcomes, ranging from a straightforward extrapolation, or linear continuation scenario to more optimistic and/or more pessimistic outcomes. To these can be added less likely 'disaster' and 'transformation' or unlikely positive interventions. Probability and plausibility then drive the analysis, to which any additional insights can also be added. Not all commentators are uncritical of the role of scenario planning and there are a number of critics and criticisms of the method including De Gues (1988), a leading researcher at Shell. However, in a review of over 30 papers, there appears to be a relatively high level of consensus that, in the hands of a skilled practitioner, scenario planning can play a useful role in organisational learning (Schnars 1987) and can help influence key strategic behaviours (Shoeumaker, 1993). Scenario planning is

therefore a well-validated and now well-accepted method designed to prepare planners to deal with uncertainties, risks and less obvious future challenges.

II.2/ Definitions

Horizon Scanning is a tool that falls within the domain of health technology assessment and is defined as:

“The systematic examination of potential threats, opportunities and likely developments including, but not restricted to, those at the margins of current thinking and planning. Horizon Scanning may explore novel and unexpected issues as well as persistent problems and trends’’ *(*Chief Scientists Advisers Committee, September 2004).

However, given the relatively new nature of Horizon Scanning to the research domain, the term, and to some extent, the methodology has not yet been fully crystallised out into a single uniform approach and whether this is necessarily a good or bad thing is difficult to determine at this stage. The Environmental Research Funders’ Forum (ERFF) a UK entity, has acknowledged this, commenting that no unanimously agreed approach exists, but do recognise that it has replaced previous terms such as ‘environmental scanning’, so at least the terminology has reached a point of standardisation.

It is agreed that the technique is by definition 'future oriented' with a focus upon technologies and systems. Brown, Dillard and Marshall (2005) have made an attempt at analysing the concept and suggest that Horizon Scanning is a 'process which can be interpreted as being either continuous or periodic'. Most published Horizon Scanning appears to conform to the latter. Brown goes on to comment that the emphasis upon a 'systematic arrangement' would imply a common methodology, but again it may simply be too early in the concepts development to expect this to become universally accepted.

Douw, Vondeling, Eskildsen and Simpson (2003) simplify the definitional issue with his input, "timely information on the impact of health technologies to decision makers in health care" (p. 5). Reflecting on this contribution, Brown offers the following definition:

"Horizon Scanning is a systematic process of objectively evaluating the status and potential benefits of foreseeable technological development based on contemporary research evidence" (p. 200).

It is, therefore, an enhanced permutation of the Strengths, Weaknesses, Opportunities and Treats (SWOT) analysis commonly used in a variety of managerial planning applications.

II.3/ Health Technology Assessment and Methods

The International Network of Agencies Health Technology Assessment (INAHTA) has defined Health Technology Assessment, (HTA) [a term coined by the US Congress in 1967], (May 15 2009) as “the multi-disciplinary field of policy analysis that examines the medical, economic, social and ethical implications of the incremental value, diffusion and use of a medical technology in health care” (p. 1).

Gabbay and Walley (2006) offer a similar definition in their *British Medical Journal (BMJ)* article: *Introducing new health interventions.* Goodman (2004) puts forward a rather longer description and definition echoing the *International Network of Agencies (INA),* highlighting the close connection with policy studies and the concomitant financial, political, social and legal aspects to HTA choices.

Since the 1960s, there has been an increasing degree of international recognition that HTA activity is of prime importance to industrialised societies who typically spend a large proportion of their Gross Domestic Product (GDP) on health services. As such, it has moved to the centre of the health care research agenda in many countries with a more balanced and controlled approach, which increasingly accepts that new technology can bring risks as well as benefits. In the UK, this recognition has led to the HTA programme being incorporated into the activities of the National Institute for Health Research (NIHR). This organisation’s website describes its role as ‘producing independent research information about the effectiveness, costs and

broader impact of health care treatments and tests for those who plan, provide or receive care in the NHS'. Essentially, the task is, conceptually at least, a simple one, finding out what works, for whom, at what cost and within the context of what alternatives are available.

HTA is a truly international enterprise and a joint European-US collaboration resulting in the *Journal of Technology Assessment in Health Care* being published in 1985. This was followed immediately by the founding of the International Society of Technology Assessment in Health Care (ISTAHC) and subsequently the Health Technology Assessment International (HTAI). The aim of HTA is eclectic, but there are both limitations and different approaches with Henshall, Oortwijn, Stevens, Granados, and Banta 1997 concluding that the primary task is to identify the benefits that will accrue from the assessment itself, with the subordinate consideration determining advantages from the technology itself. In terms of methodological process, most HTA analyses utilise an integrative approach reviewing and synthesising data from primary studies (Draborg, Gyrd-Hansen, Bo-Poulsen & Horder, 2005). Busse, Velasco, Perleth and Orvain (2002) identified the Cochrane type systematic review and meta-analysis as being the most favoured of these methods.

Some commentators, such as Battista (1996) in his metaphor-laden essay on the subject, in which he conjures up the analogy of HTA being a tree, rooted in scientific inquiry, but with its leaves orientated towards policy, embarks on an ever more lyrical view of the relationship between science, the necessity of HTA and its relationship

with public policy. He draws a parallel between the associated risks and tensions that exist for the contemporary researcher, which he equates with the journey of Ulysses. This may be an overly metaphorical approach, but the need for policymakers to make objective decisions regarding the introduction of new methods, service models and technology, is becoming even more acute today in an ever more cost-constrained environment.

There are many common health challenges in the industrialised and developed world, which can be summarised as demographic change, such as an increasingly ageing population with a disproportionate increase in long-term health conditions. Many of these conditions were once fatal but many are now increasingly susceptible to health care interventions. This growing population of, older, sicker people often live within relatively small physiological margins, which can be overwhelmed by acute exacerbation of their conditions. The clinical complexion of disease is increasingly made up of malignancies, degenerative arthritis, neurodegenerative cases, chronic cardiovascular condition, fragility fractures and mental health disorders within a population that has a higher rate of obesity. Despite these afflictions, life expectancy continues to improve (BBC 18th March 2011). This is a unique challenge, which represents very different challenges than any previous generation, but does not automatically lead to a poor quality of life. Health care science is successfully adding years to life, but also now recognises that adding life to years and sustaining a larger, frailer dependent population is bringing with it a series of clinical, social, organisational and economic challenges that are unprecedented.

In democracies, populations have well documented and increasingly high expectations of health care, including ambulance services in terms of safety, convenience, accessibility, outcome and customer service and vote accordingly. They also expect that advances in diagnostics and therapeutics will be readily available and have a poor tolerance of any 'post-code' lotteries, which are readily seized upon by the media. This situation has to be managed by policymakers who require the best available scientifically grounded information upon which arguments over the availability of new drugs technologies and methods are based. This desire has led to an increasing emphasis being placed upon institutions such as the National Institute for Clinical Excellence (NICE), (one of the very few parts of the public sector to see a significant increase in its budget) and resources such as the Cochrane Centre, playing a larger role in the development of health policy. Another example of this trend is the development of 'NHS Evidence', and the increased emphasis being placed upon research activeness for service delivery and improvement in the NHS and the higher profile of HTA. This trend is widely embraced by both clinicians and managers. The NHS Confederation has recognised this and made supportive statements, stating that 'research is crucial to the NHS. It helps the NHS understand, adapt and respond to the challenges it faces'. Most recently, the link between research in the form of HTA, other activities and innovation has been highlighted by the NHS Chief Executive, who encouraged more activity in this area: "We must continue the great progress we have made in clinical research, working in partnership with the NIHR, and link this together with academic medicine and science and stronger partnerships with industry" (Nicholson, 2011), cited in *Innovation Health and Wealth*.

The need for robust evidence is therefore becoming more of a priority in health policy terms because new technologies and service delivery methods do not always deliver anticipated patient benefits and, even if there is a measurable clinical value, this may entail increased cost. This is hardly a new phenomenon as the late Potter (1997) pointed out in his land mark text: *The greatest benefit to mankind, a medical history of humanity*, where he notes that in Greek times 'pharmakos' meant both remedy and poison – kill and cure being apparently indistinguishable, or at least as probable an outcome of many treatments. This is a theme that Potter returns to in *Bodies Politic* (2001) where he suggests that 18th century medicine relied more upon 'performance, ritual, rhetoric and theatre', with some echoes perhaps reaching the 21st century. Many other commentators amplify this premise and argue that current practice does appear to demonstrate similar psychological failings that would be recognisable throughout history, such as Illich's multiple publications on the subject, starting with *Limits to Medicine, Medical Nemesis* (1975), a theme revisited more recently by Stark (2006).

Contemporary evidence of such concerns comes from the thalidomide scandal, which led to major changes in drug licensing procedures and more recently changes in surgical technology, with laparoscopic cholecystectomy being described as "the biggest un-audited free for all in the history of surgery" (Cuschieri, 1995, p.17). Endoscopic surgery was subsequently found to be an advantageous development, but only when adequate controls and training were applied. Other developments have not lived up to their initial promise and with appropriate evaluation, both cost and patient harm could have been avoided. Today, the rationale for HTA is well

accepted with concerns related to patient safety, which started to become acute in the 1970s, combined with financial pressures, paramount. The situation and problem is well summarised by the OECD (2005): "The challenge of policy makers is to create policies that can harness the benefits of technology and innovation, but at the same time achieve multiple health system objectives with the constraints of financial budgets." (p.36)

Douw and Vondeling (2006) (Table 1) and Brown et al (2005) have summarised the comparative approaches and audiences for HTA, Horizon Scanning and Evidence based Health Care.

Table 1: Comparative Approaches and Audiences for Health Technology (adapted from Douw and Vondeling 2006)

Activity	Sources of evidence	Audience
Heath Technology Assessment	Primarily Clinical Trials & Cost effectiveness Studies	Government & Funding Agencies
Evidence Based Health Care	Health Care Practice	Health Professionals
Horizon Scanning	Research organisation, Business Strategy, entrepreneurs	Researchers, health professionals, commercial and professional interests, Government

II.4/ Horizon Scanning Techniques in Europe and the UK

Horizon Scanning has become increasingly integrated into health policy decision-making across the European Union (EU) and beyond. Douw, Vondeling, Sørensen, Jørgensen and Sigmund (2004) have studied the phenomenon in a paper entitled: *The future should not take us by surprise: Preparation of an early warning system in Denmark.* The authors note that policymakers often only become aware of new technologies and new methods late in the process of implementation, thereby reducing the opportunity to take an independent objective view over health priorities and investment decisions. It could be argued that the introduction of paramedics into the health care scene in the UK and elsewhere is a valid example of this trend, with Department of Health (DH) policymakers only considering the impact and benefit of this initiative in 1984 when independent health economic advice was commissioned. By this time, at least 40 schemes of 'extended training' were in operation across the UK, some of which dated from 1970.

Banta (2003) trace the first real governmental recognition of the need for Horizon Scanning to a Dutch government report, which recognised the need for decision makers in health care to adopt a more systematic approach. Velasco-Garrido, Borlum-Kristensen, Palmhoj-Nielsen and Busse (2005) made the observation that

the intention is to act proactively, while Roberts, Steven and Gabby (2001) acknowledged that while there may well be differing 'audiences' and differing 'rationale' for the use of early warning or Horizon Scanning methods, the intention is always to avoid the 'irrational and haphazard' introduction of new technology etc. through a process of 'managed entry'.

Following the establishment of Horizon Scanning by the Dutch Health Council, Sweden followed, introducing a system to meet their needs (Carlsson, 2004). Today, the efforts of a range of EU member states are managed collaboratively through the European Information Network on New and Changing Health Technologies, or 'EuroScan'. In addition to EU members such as the Netherlands, Denmark, Sweden, Austria, Spain and France etc., a number of other countries including Israel, Australia and Switzerland share information on emerging trends (Douw, Vondeling & Oortwijn, 2006).

Many countries have developed Horizon Scanning centres (Table 2). The role of EuroScan has been commented on by Stevens, Milne, Lilford and Gabbay (1998), who do not consider Horizon Scanning as a primary methodology intended as an essential part of any early warning system. However, they acknowledge that the approach aims to provide a list of potential new health care technologies by scanning, liaison and other methods. EuroScan has determined its role as follows:

1) 'The identification of new technologies that have a potential significant impact on health services';

2) ‘To filter and prioritise’;

3) ‘To undertake assessment of the likely impact in respect of health and finance’.

EuroScan concentrates efforts upon ‘emerging’, ‘new’ and significant ‘changes’ in the use of technology. The teams conducting this work tend to be small with none reporting more than six members of staff (Simpson, Carlsson, Douw & Packer, 2002). Opinions differ on just how far into the future Horizon Scanning should effectively look, but few would consider development less than three years ahead as being in keeping with the philosophy of the method. Smee (1997) suggests a minimum period of three to five years, but many researchers consider ten to twenty years more appropriate. The time horizon is driven largely by the particular question: Is the priority managing a change process or forecasting for longer-term planning?

Table 2: Horizon Scanning systems and their operating level, host organisation, and main customer reproduced from Douw and Vondeling 2006, P. 179

Horizon scanning system	Country	National or local/ regional	Host organisation	Customer
Basque office for HTA	Spain	Regional	HTA Agency	Regional Department of Health
Agencia de Evaluación de Technologicas Sanitarias de Andalucia	Spain	Regional	HTA Agency	Regional Department of Health
Sistema de Informatión de Technologias Sanitarias Nuevas y Emergentes	Spain	Regional	HTA Agency	A network of health professionals
Health Council	The Netherlands	National Local	Governmental advisory body HTA agency	Department of Health
Committee for Evaluation & Diffusion of Innovative Technologies	France	National	HTA Agency	Hospital group – Assistance Publique Hôpitaux de Paris (AP-HP)
National Horizon Scanning Centre	England and Wales	National	Department of Public Health and Epidemiology at University of Birmingham	Department of Health in England and Wales
Swiss Federal Office of Public Health	Switzerland	National	Federal Office of Public Health	Department of Health
Norwegian Health Services Research Centre	Norway	National	National Health Services Research Centre	Department of Health
The Swedish Council on Technology Assessment in Health Care	Sweden	National	HTA Agency	Swedish Government
Danish Centre for Evaluation and Health Technology Assessment	Denmark	National	HTA Agency	Danish Government
Canadian Emerging Technology Assessment Program	Canada	National	HTA Agency	Presumed Canadian Government
Division of Medical Technology Policy	Israel	National	Department of Health	Department of Health
Australia and New Zealand Horizon Scanning Network	Australia New Zealand	National	HTA Agency and the Australian Safety and Efficacy Register of New Interventional Procedures – S (ASERNIP – S)	HealthPact (Health Ministers)

II.5/ Summary

Throughout human history there has been a strong desire to be able to foretell/predict the future, often to gain military, commercial or other advantage. Perhaps regrettably these hopes have rarely been fulfilled, as the methods available were unequal to the task. Nevertheless, efforts continued and there are numerous examples of individual authors creating literature that offers at least their personal view of what the future could or should be like, an example being Thomas More's *Utopia* and more recently Jules Verne.

During the 20th century interest in the future continued with well-known personalities such as HG Wells calling for 'Chairs in Foresight Studies' while also attempting to predict future technological developments in publications such as '*Anticipations*.' A further significant development occurred at the conclusion of WWII, due to the initiative of General Hap Arnold of the US Air Force, who led the development of a major systematic study of aviation technologies that might have military application. This work was subsequently developed by the RAND Corporation, thereby laying the academic foundations of the new discipline of Strategic Foresight, [later] Future studies.

During the latter half of the 20th Century and, thus far in the 21st Century, a number of approaches have been developed under the aegis of Foresight and Future Studies and these include Scenario Planning and Horizon Scanning. Scenario

Planning came to prominence through its successful use by the Royal Dutch Shell Oil Company, during the early 1970s. Shell employed the method deriving considerable commercial advantage. More recently the rise of Health Technology Assessment has ensured that both methods and others have been widely utilised in assessing and predicting those methods, techniques and frequently biomedical technologies that are likely to prove safe and cost effective innovations in health care.

The focus of this chapter has, therefore, been to better gain potential insights and relevance of the above to the Ambulance Service and paramedics in the context addressed in this study. The next chapter describes and discusses current workforce issues.

Chapter III

Overview of the Ambulance Service Workforce

Logically, emotionally and culturally there is a unique and symbiotic relationship between paramedics and the Ambulance Service in the United Kingdom. Paramedics have developed into a professional group, with a developing professional 'consciousness' and the Ambulance Service has become a more capable organisation with a wider remit, more central to many NHS policy objectives than at any time previously. Nevertheless, both the paramedic workforce and the organisation are recognisable from their early origins, but markedly changed in a way that was never envisaged in the National Health Service Act of 1946 or at the time of merger into the mainstream NHS in 1974. Both the paramedic profession and the NHS Ambulance Service stand on the cusp of further radical organisational and clinical change and the survival of each is in no way assured. During the past 50 years, ambulance services have experienced a staggering period of evolutionary advancement, which has transformed the management of the sick and injured in the pre-hospital setting. Taking into account the role that technology has played, it is not an easy task to separate out the 'system' changes and the 'people' [workforce changes] and ascribe a weight to each. It is worth re-emphasising that the changes

happening within the UK are part of a much broader canvas. They are undoubtedly part of a worldwide phenomenon, with some particularly strong parallels among Commonwealth countries and the United States as previously noted. These parallels are not, however, limited to these countries, although they are more immediately recognisable.

Bouvier (1993) commenting on the Australian experience said, “Paramedics should strive to be accepted as true health professionals. They have made remarkable progress in this direction in the past 30 years” (p. 1). Reynolds (2004), in an article entitled: *Is Prehospital care really a Profession* echoes these sentiments and draws attention to the pivotal role of higher education, especially degree level paramedic programmes, which she describes as “this single step could be viewed as a strategic move towards professionalism” (p. 1). These changes have been brought about by a number of pressures, which are generally less familiar than the traditional drivers of pre-hospital care, war, and the need to remove infected individuals from communities. They derive, in part, to the place the Ambulance Service and paramedics generally have found in modern health care. Their strong approval rating from the public in the UK, Australia and beyond, where they are an established part of most western health care systems, and public acceptability of their role (as evidenced through patient satisfaction surveys) support this contention. Indeed, patient satisfaction surveys for the NHS Ambulance Service ceased, due to consistently high rating.

The older imperatives of injury and disease remain in 21st century guise and are now augmented by many other forces including social and attitudinal change amongst consumers of health care, the redesign of health care services and technological innovation. The increasing emphasis being placed upon reducing conveyance rates to hospitals is accelerating the need for assessment, diagnostic and treatment options within the Ambulance Service, responsibilities that are likely to fall increasingly to paramedics or others with relevant skills.

For this process to reach its logical conclusion, the Ambulance Service will complete the move from a relatively marginalised position on the periphery of health services to a much more central and integrated role fully engaged with, in the case of the UK, the NHS. Alternatively, new organisational forms developed from other parts of the health economy might emerge and there is no guarantee that ambulance services will fulfil these roles. The jury is very much 'out' as to what the future might or might not hold. However, there is a recognition that undifferentiated health care needs, clinically well below the level of the traditional 'life threatened' patient, are ever more strongly represented in demand for emergency ambulance services today and that a change of approach is needed. Indeed, this is now a frequently re-stated DH policy objective, articulated in *Taking Health Care to the Patient 1 (2005)* and *2 (2011)*and in other documents. However, nothing can be taken for granted and there is no single guaranteed future. Political uncertainty regarding the future of the NHS has never been greater. The commissioning intentions that will accompany the full implementation of the Health and Social Care Act in 2012 cannot easily be second guessed and there are now more options available to decision makers than simply

continuing with essentially a monopoly public service or a largely homogeneous ambulance service workforce.

Equally unforeseeable in 1946 has been the corresponding impact of developments over the last half-century on ambulance personnel themselves, or the wider demographic, social and technological changes that are often taken for granted. In the 21st century it is increasingly clear that paramedics are now well embarked upon a process of professionalisation, encompassing tremendous and far-reaching change, the end point of which is arguably less clear than even a few years ago. It is often noted that prediction is a difficult business especially when one is trying to consider the future. Nevertheless, as Winston Churchill famously observed: “The further backwards you look, the further forward you can see” (Greenspan, 2007). For this reason any examination of the origins of both ambulance services and paramedics are therefore timely and important to fully appreciate the context of change.

There are certainly insights to be gained by even the casual ambulance historian into the world of pre-hospital care, as it is perceived today, and perhaps even lessons for tomorrow. Beyond such concerns are the wider, even less tangible, considerations that accompany the journey to professional status. It is hard to imagine any group making such a transition and emerging successfully without an appreciation of their roots, history and heritage, and perhaps an appreciation of the challenges that have been overcome by our predecessors who act as an inspiration for the challenges of tomorrow.

Until comparatively recently the career structure for NHS Ambulance Staff lay outside of the Allied Health Professional domain. A structure did however exist, based on a pseudo paramilitary rank structure, and published in the *Basic Ambulance Manual* (Institute of Health & Care Development, 1999) and in the *Whitley Council Handbook (2001)*. Neither of these reference sources remains in effect and there is no universal equivalent today, although most services retain some form of insignia, which is broadly similar to the 1980's 'rank structure' for visual identification purposes. However, given the move to allied health professional status, it is now possible to stratify paramedics in terms of their NHS career framework level.

Once registered, paramedics join at career framework level 5, as with other AHPs, as illustrated in Appendix VIII. Figure 116 (p.376) shows a more complete picture drawn from NHS data sources and demonstrates that most paramedics are employed at level 5, with very few rising above this, certainly in terms of 'clinical' responsibilities. Most of the 'operational' [field or direct patient facing] Ambulance Service Workforce has been, therefore, comprised, until very recently of non-registered personnel, primary ambulance technicians and ECSWs and this discounts the control room staff, who represent another grade of support workers, with patient-facing responsibilities, exercised remotely through telephone triage responsibilities. This is a very different picture and a very different situation when contrasted with other more established allied health professions in whose case, clinical career progression, in line with the AHP career structure is an expectation and almost a right. The rate of fall in 'support worker' numbers in favour of paramedics, has

however, only been identified in 2012 NHS workforce figures (reference previously cited). The consequences of these discontinuities with established AHP's practice and the predictable and less predictable consequences will be explored in more detail in later sections.

III.1/ Overview of the environment that the NHS Ambulance Service in England operates within

This section deals briefly with some of the wider political, economic, commercial, technical and environmental considerations that will have a bearing on the discussion section, but which are not formally part of the later Horizon Scanning process or other analyses. It is of relevance due to the potential for the established public sector model of Ambulance Service to change. Due to the relationship between this 'parent' organisation [the NHS Ambulance Service in England] and paramedic workforce specifically, coupled with the realities of a worldwide economic downturn, with immediate ramifications, it has been included for completeness.

Health care is increasingly expensive; as an example representing 17.9% for year 2012 of GDP in the United States and 9.3% in the UK. (The World Bank Group, 2013). Some commentators, for example, Baumol (2012) in his recent book *The Cost Disease* suggests it will reach 60% of GDP during this century. This phenomenon is largely a function of what is termed by Baumol as 'medical inflation'. He contends that doctors and, to a lesser extent, other health workers do improve

productivity, but only at a very slow rate or, in some cases, not at all. In reviewing Baumol's contention, the *Economist* notes in *Free exchange: An incurable disease* (September 29, 2012, p. 84) that in mixed economies, the answer, at least in part, is to progressively shift health provision to the private sector, and to nurses and other health professionals who tend to be more malleable and amenable to improvements in productivity. These trends have certainly been taken to heart by the former and current political administrations and has been increasingly apparent in the context of the NHS for a number of years.

The commercialisation of ambulance services is continuing; data is sparse, but the simple fact is that all UK ambulance services now employ private contractors. St John Ambulance and the Red Cross, both voluntary aid societies, now offer ambulance services to support the NHS on a fully paid basis. Private sector ambulance services have sought to enter the 999 market place recently and have formed the Independent Ambulance Association (IAA) [http://www.iaauk.org/]. Many of these operators have acted as sub-contractors to the NHS, providing additional ambulance capacity to assist at times when the NHS service has been overstretched.

While many of these businesses are small, there has been a trend for venture capitalists to fund an expansion in scale in this area and for certain large companies with experience of providing a range of services to the public sector, to acquire and 'grow' some of these 'marginal' providers into larger players. In future, these companies and the voluntary aid societies, who have a long history of providing

ambulance services pre-dating the NHS and a more recent track record of commercially provided ambulance provision, may seek to compete more actively within a more plural NHS 'market'. In doing so, organisations will be responding to the 'welcome' or invitation extended to any 'qualified' or 'willing' party. [In current Alliance Government political terminology, essentially, these terms embrace all those with Care Quality Commission accreditation to provide health care services.]

These developments threaten the core business of the NHS Ambulance Service, particularly in England; less so in the devolved countries of the UK, who are less open to embracing large-scale competition. Other factors further complicate the position, epitomised by two further trends. First, as demand for ambulance services grows, the additional requests for service increasingly mirror the sort of clinical presentations that would have traditionally been dealt with by primary care. In recent years, changes to the General Medical Services (GMS) contract for general practitioners have had the effect of reducing the availability of family doctors, particularly during out-of-hours periods and the substitute provision has been both limited and generally ambivalent over who deals with this cohort of patients. Media attention has been intensive over the last decade or more, with regular stories such as the recent *Guardian* exposition of unfavourable service provision (September 2012).

Patients typically present with undifferentiated/undiagnosed conditions and are anxious over the level of clinical risk they may experience. Potentially, any case could therefore, be clinically serious, although generally only a relatively small

proportion of patients who call 999 have life-threatening or emergency conditions. From a patient's perspective, accessing the Ambulance Service is an expedient response to any unresolved clinical ambiguity, an area that will be considered in the discussion section. Given that the Ambulance Service is the only NHS system built without barriers, this demand often flows down the path of least resistance; 999 calls and triage systems are an attempt to regulate and prioritise this demand.

One problem facing Ambulance Service planners is that in reality many other agencies could, at least in theory, deal with many of these patients, either in primary care settings, through the services of out-of-hours providers or community based, nursing staffed walk-in-centres, NHS Direct, alternative access numbers and others. This seems to be something of a remote concern based on data that will be explored in later sections that shows rapid increases in ambulance call volumes, but changes in incentive structures could have a major effect and, in theory, curtail or at least redirect this work.

The second trend is something of a paradox and conflicts directly with the situation outlined above. There has been a general retrenching of health services, particularly those designed to meet the high volume of patients suffering with generally non-life threatening, but concerning conditions, during the out-of-hours period i.e. after 17:00, throughout the night and during weekends (128 hours of the 168-hour week). In parallel, there has been increased interest in using alternative means to the NHS Ambulance Service to meet the needs of a much smaller cohort of patients with

presumed life-threatening illness and injury, particularly those who have suffered major trauma.

This trend reflects a European approach and could be argued to simply represent recognition by certain personalities within the medical profession regarding their responsibilities to provide the best possible care to those patients at greatest risk. This area will be discussed in more detail in later sections and is a major focus of the discussion section itself. What this means in practice is that many organisations are seeking to duplicate the role of the NHS Ambulance Service and thereby overlap with the role of paramedics, arguably providing a better service for patients. This contention would need to be answered with reference to the developing evidence base, economic considerations and international best practice. Such organisations include charitably provided air ambulance services, hospital outreach teams and Immediate Care Schemes (generally voluntary groups of general practitioners with an interest in providing emergency services) hitherto largely provided on a pro-bono basis, but increasingly seeking direct commissioned funding.

Other sections of the NHS are also competing in this area, with the development of A&E based Mobile Incident Emergency Response Teams (MIERT) and other groups. Implications for the Ambulance Service include:

(a) Emerging direct competitors for the traditional core business function, including potentially, the emergency control function which could face competition from non-ambulance services being allocated responsibilities to provide NHS 111 services. The proposed contracts include a provision for

providers to be able to mobilise an ambulance response without reference to ambulance control. Calls would simply be rooted directly to ambulance dispatchers through ‘technical links’.

(b) Many alternative existing providers who share the core capability of dealing with patients with largely non-life threatening concerns. This is the area of real growth for ambulance services which has ‘captured’ an increasing amount of the market by being accessible, basically by being available 24/7. This is a position which many other providers have sought to avoid or deliberately under-provide for. However, traditional providers, such as General Practitioners (GPs) and many nursing staff are well suited to providing these services and have far more experience in doing so over a much longer period than the Ambulance Service or paramedics.

(c) An upsurge in interest from a small but influential body of medical personalities who are interested in extending the role of ‘hands on medicine’ into the field to meet the needs of a very small group of patients, thereby emulating the FGM (as opposed to the AAM) of Emergency Medical Services (EMS). While medical numbers remain small, there has been considerable development in this area during the last three years. The new sub-speciality in pre-hospital medical care will provide an ever-growing cadre of suitably qualified medical practitioners to provide this service. The British Armed Forces already use this approach in contrast to other North Atlantic Treaty

Organization (NATO) member states, most notably the United States of America (USA).

The business environment in which the Ambulance Service is now operating and in which it will increasingly operate, is becoming more hostile, more challenging and more competitive, at least in part due to the Alliance Government's Health Bill which has been widely contested but which is now on the statute books. There are therefore many risks, including the loss of core activities and fragmentation. This could be presented as aiding diversity in service provision while providing incentives to raise quality. These trends represent serious threats and risk, requiring a fundamental change in ethos, and embracing more business-like approaches. It is also likely to involve more sub-contracting that might extend to the most acute life-saving functions being provided by other agencies, thereby changing the culture of the Ambulance Service and providing alternatives to its continued existence as a state monopoly provider.

Conventional ambulance services (see Figure 1: View of the "traditional" ambulance service) emphasised transport with limited treatment which was initially provided at the First Aid Level until the advent of 'extended', later 'paramedic training'. Despite the clinical, technological and organisational developments that have taken place, the Ambulance Service in 2012 still operates primarily as a transport provider, i.e. approximately 70% of the time, although this percentage is falling as ambulance commissioners seek to reduce transportation rates resulting from 999 calls. Clinical treatment has advanced but the focus continues to be on the needs of the seriously

ill and injured, not the greater number who have a variety of medical and social needs that in previous generations would have largely been dealt with by primary care services. This operational model (illustrated in Figure 1) is likely to become increasingly costly and irrelevant in the 21st century.

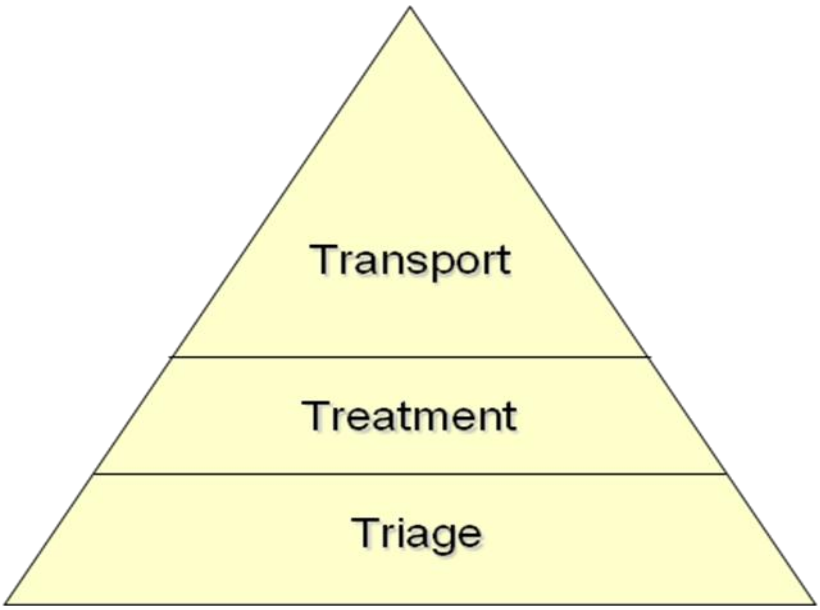

Figure 1: View of the "traditional" ambulance service

In this model, the prime aim is to provide a transport function by moving patients to hospitals and other locations for a definitive diagnosis and treatment. The level of care available within the ambulance has moved from simple first aid to more complex care, but there is still no complete consensus regarding the optimal level of treatment or indeed an agreed and coherent doctrine within the NHS Ambulance Service. This is reflected in the differences evident between services in the UK. Triage functions, in the conventional mode of operation, are most apparent in a mass casualty setting where removal priorities need to be made. As will be seen later, the above model may not represent the only approach to future service delivery.

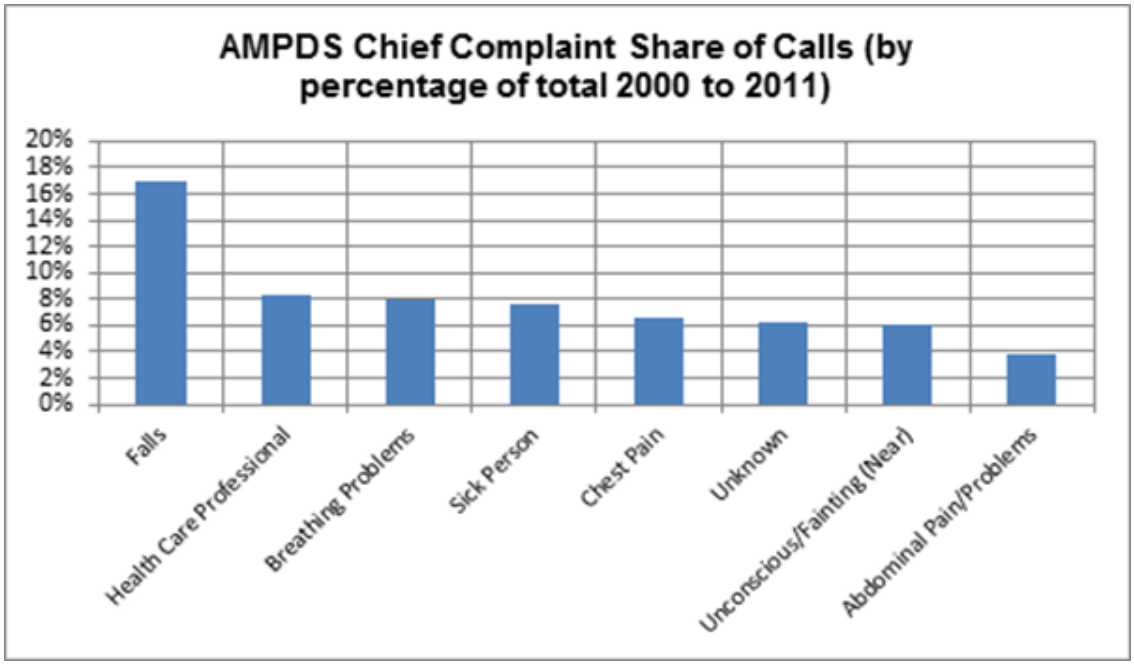

Figure 2: Advanced Medical Priority Dispatch System (AMPDS) Chief Complaint Share of Calls (by percentage of total 2000 to 2011).

Figure 2 shows eight 'chief complaints' [out of thirty three chief complaints within the system] as determined using the AMPDS triage system, developed by the Medical Priority Company, Salt Lake City Utah, discussed in a later chapter. The data is presented to provide a 'snap shot' of the type of demand and shows the top 3 conditions that present via the 999 system: Breathing problems, falls and chest pain. These are very broad descriptive categorisations that hide a multitude of actual clinical conditions, some of which are immediately life-threatening and others that are decidedly not so serious. Cardiac arrest and road traffic collisions are shown for comparison and are much lower frequency events outside the top 10 most common categorisations and are a less common event. 2012 data has recently become available for comparison and is presented in the Horizon Scanning Results section (p. 241).

III.2/ Summary

This study relates primarily to paramedics, their past, present and future and the context in which they operate. It is difficult to consider paramedics, without also considering the role that the ambulance services, within which, at least for now, most paramedics work, or to under-estimate the strong synergistic relationship between the employee and employing organisation. Both have changed radically during the latter half of the 20th Century and continue to change rapidly today and it can be hard to determine which is creating the larger force for change that could also be considered as forms of evolutionary pressure. National Policy is only useful to a degree, for while at one level it seeks wider integration of ambulance services with the rest of the NHS it also increasingly encourages greater contestability through competition, both within the NHS, and the private and charitable sectors.

The most obvious change for both ambulance services and paramedics is in the concept of operations, although this is not always overtly described in terms of a definable doctrine. In practical terms the principal change relates to the move from an historical transport role of the service and the consequent need for the provision of relatively basic care, to one that assesses patient need, treating, referring and/or transporting patients where necessary. This represents a fundamental change in role and requires a completely different level of clinical decision making skills and the ability to solve problems by the Paramedics themselves. It should be noted that only approximately 50% of the field staff of any ambulance service are paramedics, the

remaining 50% being support personnel, often termed ECSWs or Ambulance Technicians, the burden of decision-making, therefore, rightly falls predominantly upon the paramedics. In recent years paramedics have become registered health professionals, and a career framework has been introduced, but this has not yet been universally implemented. The majority of paramedics remain at the bottom of this career structure, in contrast to the more established AHPs.

While the role of the paramedic has become a subject of interest from other professional groups, the role of the Ambulance Service has also been sought after. Changes in legislation have opened non-emergency Ambulance Services to competition and tendering for 'A&E Services' is now much more likely. The advent of the '111' non-emergency access number has the potential to conflict or in the future develop to incorporate the 999 functions. Furthermore as changes in the pattern of workload become more apparent, as determined by a clinical triage system, it is becoming more apparent that other NHS and non-NHS services might wish to manage a proportion of these patients, perhaps within a community health care setting and without the intervention of the Ambulance Service or Paramedics. There is also a paradox to some degree, whereby the General Practitioner labour force is less available during the out-of-hours period; whereas patients at the higher end of the clinical acuity spectrum are increasingly of interest to charitable and non-charitable organisations that wish to provide acute care services. The overall picture is one of increasing complexity and potentially a degree of fragmentation.

Chapter IV

Literature Review

The literature review underpins many of the themes and issues addressed in the wider thesis; it proved to be a complex undertaking in itself. Hart (1998) has stated that there is no such thing as a perfect literature review, since inevitably these are written from the reviewer's perspective. This being so, readers of reviews are understandably cautious about any potential for bias, and writers of reviews highlight and declare any factors that might influence their writing. Although previously declared it is worth restating that given that the author comes from a paramedic frame of reference this must be acknowledged and every effort made to ensure that a careful balance is maintained between academic enquiry, natural professional interest in the topic area and the overriding need for research integrity.

IV.1/ Search Strategies

The main approach to search for literature in this study involved both the use of online and electronic databases and direct searches of relevant archives. Fink (1998) recommends supplementing electronic searches with manual searches to

help avoid errors in cataloguing with electronic databases, as well as to help compensate for any lack of skill or oversights on the part of the researcher. Manual approaches included searching reference lists of all retrieved articles to determine if these contained any relevant references not previously identified.

This approach was supplemented by a number of visits to archives and these were, in some cases, the result of personal contacts within the Ambulance Service. Examples included access to the London Ambulance Service Museum, regrettably since closed, with the contents placed into storage, visits to medical school and other libraries, including the South East Regional Library Service, which helped via advising on the most appropriate search techniques and obtaining a number of useful documents, not originally detected in the initial searches. The British Library proved most important; as it held [and released copies] of important documents, such as the two-part 'watershed' 'Millar' report into Ambulance Services in the UK.

Perhaps most significantly of all being granted permission to review the records helped by the former Chief Executive of the College of Paramedics, Roland Furber. Sadly, Roland passed away during the latter stages of this research, but was in the exclusive position of holding many unique documents, several of which were never published, which testified to the development of the paramedic profession. Being able to speak with Roland about these documents and his personal recollections, proved to be both humbling and tremendously insightful, thereby permitting richness to the research, which would otherwise have been impossible.

IV.2/ Electronic Databases

The growth of electronic bibliographic databases, many of which are available on-line, has continued over the last two decades, in particular, and many of these were exploited in this study. It was noted that during the research process the number of such databases expanded, and some changed form or were briefly re-named, whilst other routes to access original databases also emerged.

Table 3 lists some of the more frequently accessed and electronic databases utilised during this research.

Table 3: Examples of Frequently used Electronic Databases

Serial	Database Name	Remarks
1.	Medline	Independent and as a subset of PubMed
2.	Pubmed	
3.	CINAHL	Cumulative Index to Nursing and Allied Health Literature
4.	COHCRANE LIBRARY	
5.	ERIC	Educational Resources Information Centre
6.	SIGLE	System for information on Grey Literature in Europe
7.	Google Scholar	
8.	The British Library Integrated Catalogue	
9.	University of Hertfordshire LRC	

IV.3/ Search Terms

The value of employing electronic databases is in large part a function of the appropriate use of search terms. Combining key words, subject headings and technical terms and refining, repeating and persevering in what can be a laborious process represents the core competencies necessary if success is to be achieved. Use of the thesaurus facility helped ensure inclusion of the relevant synonyms to the original search terms and examples are provided in table 4.

The primary restricting parameter that was applied to the search terms, was that they had to be written in the English Language [with one exception, detailed later] but even here some variation was necessary due to the large amount of papers emanating from the USA, where 'Ambulance Services' are called 'Emergency Medical Services.' Systematically applying selected terms with the minimum number of restricting parameters yielded maximum, but acceptable, variation in recall of literature. The technique of 'truncation' was utilised in some cases; this involves the use of an asterisk and results in the database searching for words containing all the letters that appear before the truncation (Tait 1999). Late in the research proceedings it became apparent that some important papers had been published in Swedish relating to the topic area and these were included despite the previous limitation of seeking papers that were published only in English.

Table 4: Examples of Search Terms used in Electronic Databases

Serial	Search Term	Remarks
1.	Paramedic*	
2.	Pre-hospital Care	
3.	Emergency Medical Services	The American term for Ambulance Services
4.	Paramedic Scope of Practice	
5.	Anglo American and Franco German Model	
6.	Ambulance Staff	
7.	Helicopter Emergency Medical Services	
8.	Military medical services	
9.	Physician, Nurse, Emergency Care Practitioner, Physician's Assistant and Paramedic Pre-hospital	Multiple combinations in this regard
10.	Resuscitation and Paramedics	
11.	Health Technology Assessment	Multiple combinations in this regard
12.	Horizon Scanning	Multiple combinations in this regard

This research involved not just paramedics delivering pre and out of hospital unscheduled care, but also other groups, such as physicians, nurses and new practitioners who could be engaged in similar practice settings. Using the word 'paramedic' would have been far too limiting, hence the wide variety of terms that were utilised. To refine the searching process, the term 'paramedic*' was linked by the Boolean operator to 'and' and 'pre-hospital' and in a number of other permutations. Searches were repeated weekly to ensure that literature sources were current at the time of submission. This proved valuable as a number of new insights were gleaned from several papers, some originating from studies conducted

in connection with the care of combatants in the recent war in Afghanistan, which provided information related to medical and paramedical effectiveness. General Internet sources were also used, such as Google, but Google Scholar, as listed above proved more useful.

IV.4/ Retrieval of Literature

Throughout the gestation of this study ever-larger quantities of information were derived from many electronic and manual searches. In excess of a thousand full text papers were reviewed, not all in full, due to varying degrees of relevance to emerging themes. Other papers were received from the British Library, the regional library service and some from abroad, including from Sweden, these latter items required translation. Decisions regarding the retrieval and printing of hard copies were based largely on the content of abstracts. In some cases the promise of the abstract was not borne out when retrieved and reviewed and some papers were therefore acquired unnecessarily, but this was relatively rare. Other seemingly less promising documents proved to be of great interest, sparking new lines of thought and reasoning. In every case the reference lists were checked manually to see if other useful leads could be discerned. In cases where there was no abstract, a not altogether uncommon occurrence in electronic bibliographic databases for material published prior to 1996 a decision regarding relevance and retrieval had to be made on the basis of the title.

IV.5/ Management of Literature

The management of the literature was a major exercise in itself, both electronically and physically. Endnote, a reference management system, was utilised later into the process that was ideal. It permits the user to create individual 'libraries,' which can comprise reference material in a variety of formats, including journal articles, books, conference proceedings, reports etc. In the context of this study, the development of a 'library' of references relating to 'paramedic', 'pre-hospital care', 'ambulance and Emergency Medical Services' was possible, thereby helping to facilitate ongoing searches using the more sophisticated features of Endnotes, which are based on Boolean logic. Once read, critical commentary can be entered into the 'notes' section on the individual library record of each article. The author could then file retrieved documents alphabetically, helping to ensure that they could be located more quickly and efficiently. The management of physical papers proved, if anything, an even greater logistical nightmare, requiring the giving over of an entire room in the researcher's home for the purpose. A large series of physical files were created each of these dealing with specific aspects of the thesis.

One of the many difficulties a researcher has to address when confronted with the vast body of literature is what to include in a review when it is part of an empirical study. In the methodological literature there is debate about how much information should be accessed prior to commencing a quantitative or qualitative enquiry (Hammersley and Atkinson 1983 and Morse and Field 1996). Before commencing

this study a wide variety of searching and reading was undertaken to confirm the need for the research and to ascertain what publications had been produced within the subject area. Inevitably, these were very limited, but this fact simply promoted a more eclectic approach, that also took on, at least in part, a chronological approach in order to better understand how the sequence of events within the paramedic profession, in particular, had unfurled and influenced wider technical, policy, professional and other developments. Nevertheless, a balance was struck between the researcher becoming overly influenced by the topic areas. The majority of the critiquing and appraisal of literature occurred after completion of the data collection during the later stages of the analysis. This approach is reflected in the structure and presentation of the literature in this thesis, progressively more literature being introduced; building up to the discussion section that draws on the more eclectic range of material.

IV.6/ Summary

This chapter sets out the systematic approach used to search for literature and other resources relevant to this research. It then describes the practical and technical obstacles implicit in this project from the literature search perspective as well as describing what approaches were exploited to overcome these obstacles in a logical and evidence based way.

Chapter V

The origins and emergence of the paramedic profession

As discussed, an extensive and comprehensive literature review was undertaken to address this aspect of the project. It involved a number of searches covering a variety of topics including Evidence Based Healthcare and Management, Ambulance Services, EMS, Paramedics, Clinical Education and Training and professionalisation. These searches retrieved journal articles that related to the American pre-hospital world and approximately 80% of all research activity in pre-hospital care appears to be generated in the USA. Manual library searches were also conducted along with a visit to the London Ambulance Service (LAS) Museum, the latter which netted useful primary material of a historical nature.

National policy documents were readily available but some key documents had to be sourced from the British Library, such as the 1966 and 1967 Millar reports, while other key documents were secured directly from universities, such as the seminal 1984 discussion paper: (Wright, 1984). The BPA, now known as the CoP, was also generous in allowing access to their archives, records, files and other materials with the Chief Executive providing opportunities for personal communication, which

proved valuable in terms of the insights gained and provision of direction to some of the more obscure, but valuable items. Finally, a large private collection of related materials, including some publications no longer in print and several hundred articles dealing with ambulance services and the development of paramedics were also regularly accessed and proved to be an exceptionally useful resource.

Internet searches required adaptation to the search process in terms of specificity and sensitivity. For example, in order to identify appropriate texts on Evidence Based Healthcare and Policy-making there was a need to increase the specificity by narrowing the search terms. Conversely, for the specific items relating to pre-hospital care there was a need to broaden the search to increase the likelihood of retrieving relevant items.

V.1/ Historical development of the Ambulance Service and the Paramedic Profession

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The following sections are divided chronologically and chart the development of pre-hospital care and, specifically, paramedics who are firmly rooted within an historical context. As with other aspects of modern life, there are many influences that can be discerned that are directly relevant to the situation faced by paramedics today. The character and the role of paramedics and that of the Ambulance Service result directly from these influences. They include the rise of humanitarianism, together with practical needs associated with warfare. The very character of paramedics can

arguably be attributed at least in part to developments in the Napoleonic period and there are close parallels in some respects between the circumstances that gave rise to widespread adoption of pre-hospital and ambulance services 200 years ago and some of the frictions and challenges faced today. It is also interesting to note that Bob Marley, a renowned singer and performer of the 1970s, stated (and no doubt, countless historians will have noted anecdotally) that "If you knew your history you wouldn't have to ask where you are coming from."

The starting point is the organised provision of care in Britain, following Roman occupation, which was, perhaps surprisingly, remarkably well conceived along recognisable principles and which was not rediscovered and developed until the Napoleonic period. These early developments truly represent early evolutionary pressures on service and professional development and are considered albeit briefly, while also marking the changing relationships between medical and non-medical, i.e. non-physician, delivered care. Each period demonstrates patterns, both in terms of the relationships of care providers and the service designs within which care has been provided. There are many important lessons in respect of the necessary confluence of variables that led ultimately to the development of paramedics in the UK.

In later analytical sections within the discussion, a key contention is that there is a symbiosis between the necessities of implementing ambulance services and the development of paramedics, initially to assist military objectives, in relation to the morale of combatants and also out of simple expediency. Only later were these

ideas translated to civilian practice, in some cases part of a wider public health agenda, or for other humanitarian or pragmatic reasons, such as the removal of infected persons from the main population. These factors have had a direct bearing upon the creation of paramedics as they are known today in the UK and provide the context for the current study.

The technological advancements that have accompanied the development of modern pre-hospital [ambulance service/emergency medical] organisations during the 20th century and across the industrialised world are also relevant. The frequently encountered economic constraints and health economic considerations inevitably associated with any health care delivery are equally relevant. These factors would normally militate against utilising more expensive medically qualified personnel if suitably trained and effective alternatives were available, but the cost of medical labour has not always been a relevant factor, especially when no credible alternative was immediately available. These factors can really only be adequately considered in an historical context and help explain why medical dominance and control over ambulance services has been retained in most international systems, but not in all, or at least in markedly different ways. Medical 'direction', or certainly strong medicinal involvement, is but one important element of an effective pre-hospital care delivery system and the manner of relationship with paramedics, both technically and culturally, has existed in a variety of different forms at different times and continues to do so.

The following sections, however, move from a descriptive explanation of historically accepted fact to more contestable arguments in the late 20th and early 21st century and set the scene for what follows.

V.2/ The Early Years, Ancient to Medieval Periods

The human race is no stranger to violence and the results of traumatic injury. From the earliest days of human existence, the necessity to hunt animals and inflict fatal wounds in order to procure meat has been common experience. Internecine tribal conflicts would have created an additional experience, together with the ever-present risk of accident and mishap, often accompanied with the effects of infectious disease. Our ancestors, without the benefit of the wheel, presumably attempted to render whatever aid they could muster by removing stricken individuals to shelter on the backs of their kinsfolk. For the purposes of this text, the story of paramedics and of ambulance services will start at a convenient point in the history of the inhabitants of the British Isles during the Roman occupation. This era brought with it an organised system of pre-hospital and for the Roman Military at least, hospital care, thus enabling readers to answer the age-old question: What have the Romans ever done for us? 'Paramedic' care is possibly one such benefit.

Descriptions written during Julius Caesar's exploratory raids of Britannia in 54–55 BC suggest a well-rehearsed logistical ability that appears to have extended to the efficient extraction, evacuation and first line care of the wounded. Although historical

information is sparse, there is evidence from later campaigns, particularly those undertaken by the Emperor Trajan in the early 2nd century, and commemorated pictorially upon Trajan's column in Rome, that clearly shows first aid being rendered by legionaries. Details regarding Caesar's expeditionary raid upon the southern British Isles, at least in terms of the medical facilities, are lost in the mists of time and only the latter Roman occupation has left documentary evidence, principally in architectural form, as to this particular aspect of Roman military life.

The hazardous full-scale invasion of Britain in 43 AD led by Aulus Plautius, involved four complete Legions and resulted in the establishment of a large Roman presence that continued for 400 years. Each individual Legion had dedicated medical facilities available to it. These included medical officers, together with medical assistants – *mitites medici*, termed *capsarii*, a word derived from *capsa*, meaning dressings box. The specific function of these soldiers during battle was to extricate the casualties and provide aid in the battlefield; in this sense, their role was very similar to that of a modern military paramedic. Each life saved was often rewarded with a piece of gold. Prior to this time, the arrangements available to the indigenous Celtic tribes were certainly less elaborate although animals and wheeled carts were probably utilised, given that the Celts were skilled in using chariots for offensive purposes.

The Roman occupation resulted in the construction of eleven regional hospitals called *valetudinaria*. The level of organisation of this establishment, presumably served with a transport system, appears to have been relatively sophisticated. Records demonstrate that considerable care and attention was awarded to the

health of the Legions. Each hospital was administered by a *praefectus castrorum*, a senior officer within the military hierarchy. This system was sufficiently advanced to lead Gill (1990) to surmise that victims of major trauma in Roman occupied Britain had a better chance of effective and timely treatment than in contemporary Britain's NHS. Although these comments represent something of an exaggeration, many commentators have echoed the implicit criticism of late 20th century health-care provision for the critically injured, particularly when considered from an organisational perspective. Indeed a slew of reports echo these concerns, including the Royal College of Surgeons: *Better Care for the Severely Injured* (2000) and the National Audit Office Report (2009). Certainly, the Romans were among the first to fully appreciate that effective arrangements for managing casualties require sound organisational arrangements coupled with well-trained clinically competent providers of front line care; one without the other is likely to prove woefully insufficient in generating favourable outcomes for patients. These lessons have had to be relearned many times during the last 2000 years and are only being resolved within the NHS in England today through the implementation of major trauma centres and trauma networks from April 2012.

The Anglo-Saxon invaders of circa 50 AD are believed to have employed a suspended hammock mounted on a cart in order to convey patients. The Normans used horse litters for similar purposes; these forms of transport were augmented and later superseded by the English long wagon, a cumbersome vehicle that must have required considerable horsepower. It is unlikely that the patients would have discerned a great improvement between these different forms of transportation.

The early Christian Crusades in the 11th century inspired the foundation of disciplined religious orders including the Knights Hospitallers, later termed the Order of St John, for the purpose of providing humanitarian assistance for the European Crusaders. Immediately after the successful siege and subsequent capture of Jerusalem, a small hospice founded by traders on behalf of pilgrims was expanded. However, the arrival of some level of medical care failed to dissuade Knights from carrying a traditional *misericord* (a small dagger that could be used to dispatch mortally wounded friends and enemies alike, in a manner one might use a bodkin to negotiate a lobster's armoured shell).

The religious orders that provided care and attention received both financial support and land in order to expand this hospital of St John of Jerusalem. The nuns and monks themselves were required to take vows of obedience, poverty and chastity including a specific undertaking in the form of an oath that left would-be recruits in no doubt as to the personal privations that they would face. This warning captures the not dissimilar characteristics of both yesteryear and modern day ambulance work:

> Though it be that you see us well clad and with fine chargers, and all thing for our comfort, you are warned that when you would eat it will be necessary to fast, and when you would fast it will be necessary to eat. And when you would sleep it would be necessary to watch, and when you would watch, it will be necessary to sleep, and you will be sent to places where you will not wish ... And it will be necessary to abandon all your own desires to do those of another and the other

> hardships that it will be necessary to endure in the Order are more than I can tell you. (Rule Statutes and Customs of the Hospitallers, 1099-1310, p.192).

During the medieval period, medicine remained substantially unimproved, as did transportation arrangements for the sick and injured although many armies would have received limited access to ‘barber surgeons’ who provided some level of assistance. In the non-military world, there are some isolated examples of innovations exemplified by the Oratorians, a religious order in Rome operating during the 10th century, and providing emergency aid to the stonecutters of Milan circa 1393. Numerous artisans were involved in the inevitably perilous task of construction and maintenance of Milan’s Cathedral when serious injuries would have been common in an age before health and safety legislation.

The Venerable Arch brotherhood of the Misericordia, founded by The Dominican friar St Peter the Martyr, provides another particularly striking early example of distinguished humanitarian assistance. From 1325 the Misericordia received official recognition from the leaders of Florence for their work with the sick and injured which included transporting these patients to the city's hospitals. Unusually, members of this organisation were required to offer their services anonymously, wearing a black gown with hood in order to assure anonymity, thus ensuring that those motivated by person recognition or the desire for early examples of media attention, would be less inclined to apply.

Throughout the centuries, certain leaders did attempt to make rudimentary provision for their armies. Queen Isabella and King Ferdinand of Spain introduced a particularly enlightened approach. Such examples were uncommon; military thinking usually regarded wounded combatants as an impediment to the movement of troops and, as such, a barrier to the prosecution of war. During the siege of Malaga in 1487, Isabella and Ferdinand took an unprecedented interest in the medical needs of their troops. This included the provision of temporary tented hospital facilities termed *ambulancias* that, by their very nature, could be moved as necessity dictated. The term 'ambulance' is itself derived from the Latin *ambulare* (to move from location to location) but was introduced into the English language from French. The application of the word to mean simply a vehicle for transporting wounded, rather than a forward military medical unit, is a relatively recent phenomenon that can be traced to the late 19th and early 20th century.

Conflict has remained a dominant theme throughout the ages and has proved over time to be a driving force for change in the provision of care to the wounded. When hostilities occurred, only ad hoc measures were likely to be instituted for the victims of the many disputes. Not infrequently, incapacitated combatants unable to leave the battlefield without assistance succumbed at the hands of camp followers and others who preyed on the unfortunates. Often, the clemency of the enemy could not be relied upon. Fratricide, as practised during the Crusades, remained common for centuries to come; fellow soldiers taking the lives of their brothers in arms, in the knowledge that this action would reduce suffering. Ambroise Paré, a rare and farsighted surgeon who introduced many innovations, including early amputation and

cauterisation, recorded the seemingly horrifying fate of a group of badly burnt French soldiers during the siege of Turin in 1536 as follows:

> Beholding them with pity there came an old soldier who asked me if there was any means of curing them. I told him no. At once he approached them and cut their throats gently and, seeing this great cruelty, I shouted at him that he was a villain. He answered me that he prayed to God that when he should be in such a state he might find someone who would do the same for him that he might not languish miserably (p 1).

Benevolent well-motivated individuals like Paré and the English surgeon Thomas Gale were exceptions, frustrated by ignorance, greed and apathy, and a general total disregard for the needs of the wounded. This attitude was accurately captured by the remarks of Pierre Francois Percy, Surgeon in Chief to Napoleon's Army, 263 years later, when in 1799 he commented: “One would believe that the sick and wounded cease to be men when they can no longer be soldiers.”

V.3/ The Development of both the Ambulance and a Recognisable Pre-hospital Care System

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The breakthrough in thinking, which transformed the clinical and organisational approach to the treatment and evaluation of military causalities involved many individuals, but one man is widely acknowledged, by all commentators, as the

originator of ‘modern’ or at least ambulance services that are recognisable as following his principles today. The changes he inspired represented a new concept of operation and derived from an understanding of the clinical needs of battle casualties. All this can be traced to the initiative and perseverance of one man, i.e. Dominique Jean Larrey, whose career spans a period of immense political turbulence during which France underwent a revolution and considerable military expansion, ultimately curtailed by a disastrous Russian campaign and defeats at Trafalgar and Waterloo.

Prior to the revolution, a clear hierarchy existed within the French medical establishment. Physicians represented a small but elite group drawn from the upper echelons of society and, almost exclusively, serving the aristocracy. Surgeons, although more numerous than the physicians, were socially subordinate, effectively restricted to ministering to the poor. The new revolutionary philosophy ensured that the surgeons, who were regarded as less bourgeois (Crosland, 2004), being essentially artisans, suffered less than their physician colleagues during the many purges that characterised the period.

Surgeons had their socially enhanced position further reinforced due to two additional factors. First, the extreme shortages of medical labour were exacerbated by the enforced closure of all medical schools. Second, the large numbers of casualties generated by the many Napoleonic campaigns provided ample opportunity for surgeons to practise their skills that were frequently more relevant to the circumstances than those possessed by the physicians. Revolutionary France

created the conditions where a young surgeon could pursue new methods of treatment and new organisational approaches. As a result, the status of surgeons increased and continued to do so throughout the next century ahead of that expected in English le Malade Imaginative (Moliere, 1673). To some extent it could be argued that the paramedics of the late 20th and early 21st century are the new 'barber surgeons', reflecting similar opportunities created by a disinterest in pre-hospital care and a shortage of medical labour during the late 20th century and the appropriate skills of ambulance staff, coupled with the accessibility provided by the 999 service.

Larrey's military career commenced in the Navy which was undergoing a period of expansion to enable the French to support the Dutch in their war with England. Larrey was appointed as assistant surgeon but the Anglo-Dutch dispute was rapidly settled, leading to the standing down of the newly commissioned French fleet. A shorter than planned engagement followed. Larrey is reported to have been a sufferer of seasickness, so the return to dry land and civilian life would probably have proven particularly welcome.

After a period working in Paris he was conscripted and assigned to the Army of the Rhine, and rapidly became immensely frustrated by the unnecessary loss of life due to the inordinate delays in providing any medical assistance. After witnessing the carnage during a clash between French and Prussian forces near Limbourg in 1792, Larrey appears to have decided to take action. The principal reasons for the inadequate state of affairs were French military regulations themselves, which

mandated that medical staff remained one league behind the battle zone, thereby effectively denying potential survivors a realistic chance of timely medical care. Neither were there any means of moving the medical personnel or the wounded with anything like the relative alacrity enjoyed by front line troops.

Recognising that traumatic injuries were time dependent, and realising that it was essential to deliver the most appropriate definitive surgical care without delay, Larrey set about finding an answer. His solution was to emulate the mobility of the 'flying artillery', which involved units of horse-drawn guns that kept pace with the advanced columns of troops. This required adapting a sprung lightweight chassis to create a horse-drawn vehicle that could both deliver surgical staff and remove the wounded in a degree of relative comfort.

Remarkably, Larrey was able to gain permission for his plan from the Army commander Adam Phillippe Custine, a surviving aristocrat. Richardson, author of an excellent biography of Larrey's career, has suggested that Custine may have been influenced by the uniqueness of the times in which both he and Larrey found themselves. Perhaps not wishing to stand in the way of any initiative destined to improve the lot of the citizen soldiery, he agreed to Larrey's highly original plan and permitted the Army's unusually efficient quartermaster, Villemanzy to provide the necessary resources. Initially a small number of modified light horse-drawn wagons were constructed and placed at the disposal of the Army's advanced guard. These 'flying ambulances' or *ambulances volantes* provided a flexible and mobile resource, complete with medical personnel, and were able keep up with the fluidity of the

changing battlefield situation and changes in tactics. In later iterations, Larrey grouped his ambulances into small units of about 300 personnel, thereby creating the forerunner of a modern military field ambulance, medical battalion or close support medical regiments. Custine fared less well, being guillotined on his return to Paris.

Larrey's new ideas were first put into practice in the mountains near Konigsberg when Austrian forces engaged the advanced guard. Although the terrain was difficult, the ambulances proved their value. As a result of the performance during the Rhine campaign, Larrey received a citation for gallantry and ingenuity, an unusual honour for a surgeon at the time. Larrey also found time to develop triage methods and is regarded as the originator of the triage concept (derived from the French verb 'to sort'). These innovations did not always meet with acclaim, either from medical colleagues or military officers. Many rejected the notion that the injured should be treated in accordance with their clinical priority, especially if they were the enemy. Hitherto the patient's arrival order or, even more importantly, their rank, had been used as the dominant deciding factors.

During the many succeeding conflicts the flying ambulances were refined and developed, gradually being extended to formations throughout the Grand Army of France. During the Egyptian campaign, adaptations included the use of camels and other animals. Larrey's career progressed to the point where he was appointed Surgeon to Napoleon's elite Imperial Guard, a prestigious post but inferior to his colleague and rival Baron Percy. It should be noted that Percy initiated a number of

improvements, many of which appear to have emulated those of Larrey, but also included the development of a corps of stretcher-bearers termed *brancardiers* to retrieve wounded soldiers to the field surgical teams (Baker, 2007).

The perennial problem confronted by Larrey and Percy was the low status of the French military medical services that were a subordinate element of the Administration, specifically the logistics corps. However, as Corbett-Bell (1967) notes, by the late 18th century the French army had the most advanced emergency medical services available to any army in the world. Larrey was extremely voluble in his detestation of the corruption and incompetence that permeated this organisation and was therefore constantly at odds with many of his superiors. He was fortunate to enjoy a large measure of personal support from Napoleon, who recognised Larrey's work as "one of the greatest conceptions of the age" (p. 2. Chan and Denomme 2012), later describing Larrey himself (when writing while in exile on St Helena) as "the worthiest man I have ever met." (p. 2. Karamanou, Rosenberg, Liakakos and Androutsos 2011). Larrey was an honest man whose integrity appears unchallenged; he was certainly a tireless campaigner and advocate for the common soldier. Napoleon's epitaph is therefore fitting for a man who, as one of the architects of pre-hospital care, has made a contribution that stands second to none.

The British Army's medical services had no such celebrity surgeon and did not keep pace with the French developments. Wellington himself was aware of Larrey's work. Indeed, during the battle of Waterloo, he is reported to have witnessed Larrey treating French wounded in the thick of the fighting. Pointing his sword at the French

surgeons and commenting to this staff, he said, “I salute the courage and devotion of an age which is no longer ours.” McGrigor, chief surgeon to the Duke of Wellington had met with Larrey in Paris and admired the ambulance concept, but had not been able to institute a similar level of capability. The first British designed ambulance is attributed to a veterinary surgeon from Chatham in 1820. Ambulance barrows were also used by the Army, particularly with those elements of the Forces stationed in China. Not until 1850 was a standard ambulance vehicle produced for service with the British military. Reports of this ambulance in operational service during the Crimean war were not satisfactory and the general lack of senior backing to improve pre-hospital care is regarded by some, such as Corbett Bell, to be one of the causes of British ‘medical collapse’ back in the Crimea.

V.4/ The Rise of Humanitarianism: An Essential Ingredient in the Development of Ambulance Services

Despite biblical examples of humanitarian assistance dating to the actions of the Good Samaritan, it was not until the late 19th century that any consideration was given to providing any formal ‘rules’ under which warfare and by implication, the needs of the wounded should be met. One exception to this state of affairs is recorded in 1743, when the Earl of Stair, John Dalrymple, took an extremely chivalrous position in his dealings with his adversary the Duke de Noailes. He proposed that the hospitals of both sides be considered sanctuaries, receiving

mutual protection. Sir John Pringle later wrote "the agreement was strictly observed ... and although it has been since neglected, yet we may hope, that on future occasions, the contending parties will make it a precedent" (Mercer, 1960, p. 345).

More than one hundred years passed before Dalrymple and Pringle's desires were to be answered, and once again, the horrors of warfare were to prove the catalyst. Henry Dunant, a resourceful Swiss businessman, desired to obtain support from Napoleon III for a business venture he was planning in French Algeria. His journey led him to Castiglione where he was able to witness at first hand the resulting carnage from the battle of Solferino on 24 June 1859, fought between an alliance of France and Sardinia against the Austrians.

This battle was a major conflict involving an assault on plains of Lombardy by 138,000 French and Sardinian troops against 129,000 Austrian defenders. Dunant was so moved by the suffering that he sought to mobilise the local community to provide assistance to the wounded of both sides. Despite his best efforts, and those of the military medical services that had been totally overwhelmed, it is estimated that 40,000 unnecessary deaths occurred due to a lack of care and attention.

Dunant later wrote of his experiences in Italy in *Un souvenir de Solférino*, published in 1862. In this book he asked the question as to whether it might not be possible to "form relief societies ... for the care of the wounded in wartime .... based on some intentional principle". Dunant also lectured extensively and was able to attract the interest of a number of 'men of conscience'. He also believed that their role could enhance natural disasters such as "floods, fires and catastrophes". These included

the independently wealthy Gustav Moynier, Dr Louis Appia and Dufour, a Swiss Army general. Moynier formed the committee which led to invitations being dispatched to a number of nations.

Subsequently, a conference involving 16 countries was held in Geneva during 1864. Ten resolutions for the “amelioration of the condition of the wounded in armies in the field” were ultimately ratified. Article 6 stated: “The wounded and the sick shall be picked up and cared for, whatever nation they belong to.” The neutrality of medical personnel was also assured and the Red Cross, the reverse of the Swiss flag, was chosen as the symbol of the new organisation. A permanent international committee was formed in 1875 and still has its base in Geneva to this day. Relief societies were formed throughout Europe and later in the United States, which delayed signing the Convention until 1882. After WWI, Henry Davison, President of the American Red Cross, responded to US President Woodrow Wilson’s challenge to create a better world, promoting the idea of an International Federation of Red Cross & Red Crescent Societies that subsequently came about in 1919. Dunant paid a high price for his humanitarianism. His business interests failed and this led to personal bankruptcy. Not until 1901 was his contribution recognised, when he was honoured with the Nobel Peace Prize.

V.5/ Pre-hospital Care in an Age of Industrialisation and Industrialised Warfare

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The American Civil War, 1861–1865, concluded with the victorious Union forces enjoying the benefits of the first comprehensive modern medical service. Once again, history credits one man's vision and leadership, in particular for developing the medical capabilities of the Union army. Jonathan Letterman (1824–1872) was appointed medical director to the Army of the Potomac under General McClellan in 1862. This assignment followed a year of misfortune for the Union side.

Army medical services had been established as early as 1818 with medical officers becoming commissioned in 1847. However, organisation was totally inadequate for the task at hand. In 1861, President Lincoln authorised the formation of the United States Sanitary Commission in order to provide additional medical facilities; later this organisation evolved into the American Red Cross. Nevertheless, disaster struck when the first major test came.

The war between Northern and Southern States did not start well for the Union army. The first large-scale engagement was the battle of Bull Run in 1861. Both militarily and medically, the army of the Potomac suffered a major reverse, Union forces being rooted. The medical arrangements fared little better. Civilian ambulances employed to support evacuation of Union troops were parked some distance from the battle area. The ambulance drivers consumed the medical alcohol provided as part of the essential equipment and the only wounded soldiers to reach the safety of Washington did so by their own effort. This lack of any semblance of professional behaviour and organisation necessitated urgent change.

Understandably, the shock and humiliation of Bull Run acted as a powerful incentive to reform the care of the injured. But throughout the early years of the conflict, there were repeated concerns over the calibre of personnel assigned to ambulance and medical assisting duties, as illustrated by this quote from the period.

Ambulance and medical assistants “proved utterly worthless in bringing off the wounded, behaving with the utmost cowardice and required more persons to watch and see that they did their duty than their services were worth”. Medical authorities persisted in their attempt to subdue the artistic temperament. “Finding them [ambulance drivers and orderlies] rather an encumbrance … many were drunkards, others deserted when most needed” (Adams, 1952, p.68).

Jonathan Letterman was promoted by the colourful, controversial and highly combative figure, Surgeon General William Alexander Hammond, an action that has been regarded as his most important contribution to the war effort. Letterman energetically reorganised the Union's field medical services, introducing separate ambulance transport units under the direct control of the army’s medical services. In 1864, Congress approved a unified ambulance plan, which provided “a unified system of Ambulances in the Armies of the United States”. By this time, a thorough evaluation system was available, utilising ambulances based on the two-wheeled Finley carriage and the Rucker wagon that, in a slightly modified form, won a prize at the Paris exhibition of 1867 for the most suitable ambulance of its day.

Other forms of transport were also employed, including pack animals of various kinds. Prior to Letterman’s wartime duties, he had served for twelve years on the

south-western frontier. Here he gained experience of hostilities with the native Indian population from whom improvised methods of casualty evacuation had been learned. In addition to these techniques, Letterman had at his disposal railways and steam-driven river vessels, both able to convey large numbers of the injured and sick (Doctors in Blue, Adams 1952). This latter group made up the greater proportion of casualties in virtually all conflicts up to WWII, due to the effects of infectious disease. During the Civil War, 183,287 men succumbed due to disease, versus 96,000 in battle. Once removed to hospital, soldiers could often ‘look forward’ to surgery with the benefit of anaesthesia, a revolutionary innovation. Conditions were also slowly improving within the makeshift hospitals, due to the lessons learnt by Florence Nightingale only a few years before in the Crimean campaign of 1855.

On 17 September 1862, the opposing Confederate and Union forces fought their bloodiest battle of the conflict at Antietam where the medical facilities had to contend with mass casualties that exceeded 26,000 men. Increasingly, there was recognition that poor medical care squandered manpower and damaged the morale of soldiers. Letterman was able to capitalise on the Union side's superior organisational and logistical capability and, in doing so, attempted to conserve the fighting strength of the army. The pursuit of this aim, which was largely achieved, established principles for military medical services that are recognisable today.

V.6/ The Evolution of a Civilian Ambulance Service; the Emerging Roles of Doctors, Ambulance Attendants and Feldshers in Pre-hospital Care

The history of ambulance services designed for the civilian population is highly fragmented. Infectious disease created an overriding need to transport the sick to grim establishments known as 'pest houses' isolated from human settlements. Samuel Pepys records in his diary of 3 August 1665 that 'pest coaches' were employed to remove the sick. For the most part, this unpalatable task was accomplished using nothing more sophisticated than simple carts. There were also attempts to provide medical attention for the victims of accidents, particularly drowning, which claimed many lives. The Royal Humane Society founded in 1774, worked to improve resuscitation methods and offered direct aid for casualties.

Major changes took place in 18th century England, which was the most heavily industrialised country in the world at that time. A rapidly expanding population was increasingly being concentrated in urban areas under conditions of extreme poverty. These circumstances created ideal conditions under which infectious disease most notably cholera, could rapidly devastate whole communities. The resulting epidemics in 1831 claimed the lives of 22,000 people and some means of transporting infectious patients to hospital was urgently required.

From 1783 hospitals had been encouraged to make wards available for fever patients. This provision required arrangements for the transportation of the victims of Cholera and the many other diseases such as smallpox, although the approach was not formalised until 1866 when the Sanitary Act provided specifications for 'fever ambulances.' This development followed the work of, a London surgeon, George Glover, who had developed a 'carriage for Cholera patients' in 1832. This included a mattress warmed by heated salt. This did not fully meet the new specifications that required a covered horse drawn vehicle. Furthermore, public acceptance of the 'fever ambulances' was poor. As a result, it was necessary to redesign these ambulances in order to make them resemble conventional carriages in an attempt to reduce the associated stigma. The origins of civilian ambulance transportation were therefore very different and less glamorous than their military counterparts, with much less direct medical oversight, but with a correspondingly low status for those who operated the vehicles themselves.

Official interest in ambulance provision varied throughout the country but the focus remained on the need to remove the infected, partly encouraged by the 1886 Sanitary Act which considers provision of ambulances for the infected desirable. In the capital, the Metropolitan Asylums Board (MAB) was established with a legally enforceable mandate to convey patients to Board hospitals. As early as 1818, a Parliamentary Select Committee considered and supported the need for a systematically provided transport service for the infected (Ayers, 1971). Later in 1886, a Hospital Carriage Fund was developed (Bostock and Barrington, 1893) by

which time the MAB had already been empowered to operate a horse-drawn service of its own.

From 1881, the public health agenda, spurred by the rise in smallpox cases, created additional needs that were met using hospital ships moored near Dartford. Ultimately, four ships were needed; the first to be utilised was the Dreadnought; this was then supplemented by two further vessels, Atlas and Endymion, chartered from the Admiralty, with the Castalia added later. A temporary camp providing tented accommodation was also established in the grounds of the nearby Darenth Asylum and hired horse-drawn ambulances utilised to convey patients the eighteen miles from central London, a three-hour journey. The 'Southern' fever hospital was subsequently erected at Dartford, becoming one of a network of three such institutions, the others being based at Fulham and Deptford. A small, dedicated fleet of five ambulance steamers was commissioned in 1884, the largest being 143 feet in length and capable of transporting 50 reclining patients. These vessels provided a constant supply of new patients to the more distant fever hospitals. The service was not decommissioned until 1932, the last of the hospital ships having been taken out of service in 1903 (Burne, 1973).

Only later in 1909 was consideration given to extending the role of the capital's embryonic ambulance service to embrace a wider remit when Sir Kenelm Edward and his associate, Mr Digby, reconsidered the terms of reference under which ambulance services were provided. Their committees' considerations were ostensibly cautious, but for the time also quite prescient:

> To inquire as to the provision made for dealing with cases of accident and sudden illness occurring in streets and public places within the Metropolis, and to report whether any, and if so what, improvements in ambulance provision are necessary or desirable, and how they could be best effected with due regard to efficiency and economy. (The British Medical Journal, 1906, p.1829)

Their conclusions determined that a sufficient number of these rapid ambulances should be placed in service and that their purpose would be to deal with 'all serious street cases', thus developing a complementary non-infectious ambulance service that would be provided free of charge, with the London County Council, the lead organisation, managing the service.

The earliest attempts to develop civilian ambulance services with a remit to provide care to accident victims and others in acute medical need occurred in the United States. In the latter half of the 19th century, continuing industrialisation and a rapid rise in population led to an extremely high accident rate in factories, mines, the transport system, and in the many new industrial processes. The city of Cincinnati created the first recorded ambulance system in 1865. Edward Dalton, a former civil war surgeon who became the Sanitary Superintendent of the Board of Health, emulated this initiative in New York. The New York system was notable for providing ambulance surgeons, some of whom were women. The first female to occupy this role was Emily Barringer, who travelled to the scene and provided 'modern' medical care. The equipment level of the horse-drawn ambulances included morphine,

anaesthetics, antidotes and a stomach pump in addition to conventional equipment like splints and blankets.

Ambulance services in America tended to be integrated with individual hospitals, although after WWI, voluntary 'rescue [ambulance] squads' started to be formed, initially on the East Coast in Roanoke, Virginia. Fire Services often assimilated emergency ambulance duties. Despite these initiatives, progress was slow and, even in 1996, 50% of ambulances were still being provided by funeral directors whose hearses were able to provide a dual function to many communities.

Reginald Harrison, a surgeon from Liverpool, was so impressed by what he saw of the new ambulance services in America during 1881 that he worked to introduce a similar service on his return to England. The Liverpool Medical Institution was receptive to Harrison's ideas and established an ambulance service operating from the Northern Hospital in 1883. The service answered twelve hundred cases between 1883 and 1885 and was not replaced by motorised vehicles until 1920. This pattern of hospital-based services was emulated elsewhere but coverage was patchy. The Duke of Cambridge's attempt to introduce a commercial service in London failed to prove acceptable to the hospital authorities who were unwilling to meet the financial costs.

By default, removal of the injured from public places often fell to either good Samaritan 'bystanders' co-opting whatever transport could be made available or by the efforts of the police. This work was not always to the liking of constables as they had little training for the role that distracted them from their primary duties. To assist

officers in their enforced medical role, some services had access to two-wheeled stretchers provided by H L Bischoffscheim who founded, at his own expense, sixty-two such devices for use in London. This means of transportation was of proven value, having been employed by the Danes during their war with the Prussians in 1864. By 1910, the Metropolitan Police had in excess of 400 such 'litters', an Americanism for stretchers, that were stationed in a variety of locations, including not only police and fire stations, but also cab ranks. Such arrangements did not always meet with the total approval of the medical profession. Richard Davy, a surgeon from Westminster hospital in 1876, commenting on facilities for the 'transit of invalids' stated, "The British public have practically evinced a far higher regard for the removal of valuable furniture than for the transit of delicate Christians." (Davy, 1876, p. 553)

Inevitably, the shortfall in ambulance provision could only be addressed through the spirit of Victorian voluntarism and the efforts of a few clear-sighted dedicated visionaries. Such men included Lord Lindsay who had witnessed the plight of soldiers during the Crimean war and Thomas Longmore, a military surgeon who had published the first book on the subject of ambulance services. Longmore's work, *A Treatise on the Transport of Sick and Wounded Troops,* printed by HMSO in 1869, still stands as a landmark text. Other enthusiasts included John Furley who, like the other members of the group, held an influential social position. Through the efforts of these individuals and others, the precursor to the British Red Cross, The National Society for Aid to the Sick and Wounded in War, had been formed in 1870 and was later renamed the British Red Cross. The St John Ambulance Brigade formed the

‘Invalid Transport Corps’ seven years later, with the St Andrew’s Ambulance Association starting in 1882.

These organisations were conceived with slightly different roles in mind. The Red Cross’s first objective was to provide relief to both the French and Prussian armies during the Franco-Prussian War of 1870. Similar operations were launched to aid the victims of many conflicts during the late 20th century. The St John Ambulance Association was created from the reform and modernisation of the Venerable Order of the Hospital of St John of Jerusalem. This transformation ultimately enabled the movement to become influential in the development of ‘first aid’, a term previously coined by the Prussian military doctor Von Esmarch who had described ‘Erste Hilfe’. That it happened at all was in no small part catalysed by Dr Peter Shepherd and his colleague, Dr Francis Duncan. Together, these men introduced the idea of training the public in first aid. Shepherd went on, with the help of James Cantlie, to produce a training manual entitled Aids for Cases of Injuries. The objectives of this were to *“*furnish a few plain rules which may enable anyone to act in cases of injury or sudden illness, pending the arrival of professional help”. He is a man whose contribution is sometimes overlooked, possibly due to his premature demise during the battle of Isandhlwana in the Zulu wars.

Despite such setbacks, and from small beginnings, the voluntary aid societies set about training the public in elementary skills for dealing with casualties, transport and nursing. Ten years later, the work of St John was extended in order to provide a greater emphasis on ambulance transport. The first areas to benefit from these

proposals were the Burslem district of Staffordshire and later throughout the country. Both societies also acted as a reservoir for the military medical services, a role that was carried out with distinction during the South African war, and later during both the first and second world wars.

A variety of innovations accompanied the expansion of ambulance services in the United Kingdom during the late 19th and early 20th century. Among the most farsighted examples of 'systems thinking' was the work of Sir Robert Jones who acted as the Chief Medical Officer to the Manchester ship canal. The excavation of a 35-mile 'big ditch' represented a major engineering and medical challenge. Jones created a highly efficient integrated evacuation and trauma care system that enabled the many victims of industrial injury and sickness to be removed to medical facilities appropriate to their need. From a medical organisational perspective, the project contained many innovations, including the use of a railway line that could be used to facilitate the evacuation of the injured, two small 'casualty clearing' type units and the use of the telegraph.

Throughout the 19th Century and during the first half of the 20th Century and with, arguably, the exception of medical care during military conflicts, medical involvement appears relatively patchy, yet also instrumental, in the innovations in transport and care that gradually occurred as military concepts were gradually transferred to the civilian settings. The provision of directly provided medical care within ambulance services was clearly a factor with ambulance surgeons on the New York model prior to WWI and even lingering to some extent until WWII, representing something of a

high water mark of medical involvement, certainly in the United States. A polarisation in approach is, however, discernable, between the models in the new world and the situation in Europe. In neither case were civilian services systematically provided and there are few examples of the role of staff other than doctors, although there are some where considerable progress had been made.

These include the 'Feldshers' concept, which represents an interesting parallel case study in the rise of paramedic developments in the West and which was a common part of the Central and Eastern Europe by the early 20th Century. Feldshers originated as a concept in the 18th Century Prussian Army, but is more widely attributed to Soviet era Russia. Feldshers (essentially, part paramedic, part physician assistants) were well established in Russia, both in military and civilian practice by the late 19th century. Independent clinical practice (Feldsherism) was firmly rejected by the Russian medical authorities but remained in common practice particularly in rural Russia. Perhaps surprisingly, given the level of need for health services, their role was de-emphasised during the post-revolutionary period and virtually disbanded in favour of nurses and midwives in 1924, only to be revived in 1937. Today, Feldshers are still used extensively in ambulance services and remain a parallel example of paramedics, albeit without independent registration (Vakhrameev and Lykov 1967).

V.7/ The 20th Century, the Development of Pre-hospital Care in War and Peace

During WWI, the static nature of trench warfare allowed the application of Sir Robert Jones' work to be developed. Elaborate casualty evacuation chains that were constructed behind the network of trenches stretched back to base hospitals sited along the Belgium coast and onward to the UK. In order to meet the need to move thousands of British and Allied casualties through the evacuation system, the Army's Medical and Service Corps were supported by the voluntary organisations. That this was necessary indicates the mammoth size of the task; the British military medical services actually numbered over one hundred and fifty thousand soldiers, one and a half times the size of today's entire British Army. The Red Cross and the St John Ambulance formed a joint war committee that provided a large number of ambulances for service in France and Belgium. Members of the public donated many of these vehicles that were then converted for active service. Volunteers also provided fleets of vehicles to form ambulance columns, which successfully transported in excess of half a million casualties returning by ship and train, to hospitals located all over the country.

The ending of hostilities brought about favourable conditions under which civilian ambulance services could expand. Many serviceable motorised ambulances were repatriated from France and made ready for service with the new Home Ambulance Service. This organisation involved continued close cooperation between the

voluntary societies. In certain parts of the country, local authorities provided ambulance services using paid employees, sometimes attached to the Fire Service, and sometimes as independent ambulance services.

Even before the international situation deteriorated during the 1930s, the rapid growth in demand for ambulance services once again resulted in an expansion of this service for civilian requirements. The threat of large-scale aerial bombardment of civil populations, and the possibility of such attacks involving the use of poisonous gas might have been expected to galvanise official action. There was, however, significant sensitivity regarding any future conflict, and a policy of disarmament, or at least a significant reduction in military spending, extended to a reluctance to plan for civil defence contingencies. Nevertheless, several committees, including a sub-committee of the Committee for Imperial Defence, considered the dangers posed by possible air attack and also ‘inquired into the question of air raid precaution’. Other committees including one chaired by Sir Laurence Brock investigated related matters, particularly the medical consequences of aerial bombardment.

As early as 1924, the Royal Air Force (RAF) was asked to estimate the number of deaths and injuries that might be expected from air raids. It was calculated that 17 people would be killed and 33 injured for each ton of explosive delivered and it was anticipated that each day's assault would result in one hundred tons of bombs being dropped on the UK. Statistically speaking, each ton of explosive killed one third of a person. London was felt to be at greatest risk and an audit was made of the numbers of ambulances that could be made available. The result indicated that

London County Council could provide 25; the Metropolitan Asylums Board could provide 87 with a further 38 from the Red Cross and St John Ambulance, bringing the total to 150 vehicles. The report noted that there was a lack of uniformity in design and many stretcher arrangements were incompatible.

Real progress in preparing for war had to wait until 1935 when a White Paper was published leading to large scale re-armament, finally making provision for comprehensive arrangements for Air Raid Precautions (ARP), a title only superseded by 'Civil Defence' in 1941. These 'passive' defensive precautions augmented the 'active' military forces that included an integrated air defence network characterised by the RAF's famous Spitfire and Hurricane Squadrons but incorporating many other features. During the preceding decade, many influential commentators such as General Frederick Sykes in England, the Italian General Uilio Douhet and the American General Billy Mitchell, made public statements regarding the devastating effects of air power upon civilian populations. These protestations were not lost on the media or the public and in 1936, an HG Wells novel, *Things to Come* was turned into a shocking feature film and showed scenes of panic-stricken civilians under intensive air attack. By 1938 it was no longer necessary to speculate as to the impact of air raids as newsreels were able to show the effects of air power on civilians in the Spanish Civil war where the Luftwaffe were gaining early operational experience. A classic example of air attack was the bombing of the Basque city of Guernica, where the German Condor Legion dropped an estimated 100,000 pounds of high explosive and then strafed the civilian population for good measure, leaving a reported 1500 dead in a single afternoon in April 1937.

To meet the dawning crisis, defence was organised into the purely military components, fighter squadrons and anti-aircraft artillery etc. A second layer of passive defence activities incorporated the Police, Fire and ARP personnel, with casualty care and evacuation within the remit of the ARP for day-to-day operations, but actually under the administrative aegis of the Ministry of Health. A de-facto NHS was formed in June 1938 termed the 'Emergency Medical Services', although many hospitals remained under previous ownership. This model provided the prototype for the post-war NHS.

The organisation had to be necessarily hasty but also surprisingly comprehensive to the modern eye, given that much time had been lost due to the reluctance of politicians to fund defensive services that would provide visible evidence of preparations for war. However, rapid progress was made once the inevitability of the situation was recognised. To maintain the circular population dictated an effective casualty service in the short time remaining before the outbreak of war in 1939. The new arrangements included the creation of auxiliary fire and police services and additional resources to respond to collapsed structures. These resources included light and heavy rescue, decontamination units to manage the anticipated gas attacks, and comprehensive medical arrangements, plus expanded ambulance services augmented by first aid parties. Mobile and static dressing stations also supported ambulance services and these usually included at least a smattering of qualified medical and nursing staff. While large sections of the population received first aid training and continued to do so in the post war civil defence service, it appears that no consideration was given to more advanced clinical training. In total,

the civil defence services had available to them an army of one and a half million personnel of whom 80% were volunteers. The early official history of the Civil Defence Services during the Battle of Britain concluded that success of these personnel, “the achievement of the many” had made a vital contribution to the war effort.

In practice, the wartime casualty arrangements are generally regarded as being very successful examples of civil preparedness, and were tested across the country, particularly during the early war years. Even later in the conflict when victory was assured, new threats emerged such as the V1 and V2 rockets that resulted in many civilian deaths, but these were certainly mitigated and could have been much worse without the work of the Emergency Services and Civil Defence personnel. When the war concluded in 1945, Britain had gained vast experience in managing large-scale, pre-hospital emergencies and in the requirements of casualty evacuation. The work of ambulance personnel was singled out for high praise, especially in London, where Jackson’s account of the history of the London County Council’s response to the conflict stated that ambulance crews acted with “courage and enthusiasm to the heavy demands made upon them”. In London alone, 48,709 air raid casualties had been dealt with and virtually all the capital’s ambulance stations had been damaged by enemy action with some loss of life and injuries incurred by ambulance crews. As part of the post-war settlement, public policy was also committed to establishing an NHS that would include making ambulances available to all on the basis of medical need, although ambulance services, unlike hospitals, would remain under local

control. In retrospect, this was probably a mistake, but was made necessary to 'appease advocates of local government'.

V.8/ The Post-WWII Evolution of a Socialised Health Care System and the Provision of Ambulance Services

The NHS came in to being on 5 July 1948. The Health Service Act empowered local authorities, not the NHS, with the statutory duty of providing ambulance services for their communities. These new responsibilities provided for a comprehensive level of provision for all categories of patient emergencies, routine hospital admissions and infectious cases. In many parts of the country the voluntary services, particularly the St John Ambulance Brigade was replaced with paid 'professionals'. In other centres, voluntary services were retained. Variations included continued joint arrangements with the Fire Service or independent directly managed operations, like the London County Council.

Unlike the Police and Fire Services, there was no accompanying specific legislation, such as the Police and Service Acts, to deal with the structures, disciplinary arrangements or operational methods for the new ambulance services, which were classified as 'essential', not emergency services. Neither was there a national infrastructure of training establishments of staff colleges to provide leadership or

direction. Nevertheless, the uniforms and a paramilitary style rank structure were adopted, emulating the established emergency services.

The staff of these ambulance services came from a variety of backgrounds. These included those with recent wartime experience in either the armed forces or the many civilian rescue services, together with strong representation from the voluntary aid societies. However, without strong leadership or enforceable national standards, individual services found their own level. Neither was consistent medical direction available. Although Local Authority Medical Officers were theoretically in a position of influence, few took much interest in the ambulance services or their potential to affect patient care. After all, they were not health services. Training remained dominated by the voluntary societies and this retarded progress for decades to come, with a basic first aid certificate being all that was generally required. In comparison to its more prestigious cousins in the Police and Fire services, the various ambulance services were able to lead a relatively simple life of obscurity, blissfully ignorant of many new developments in the medical and managerial sciences.

Actor, Sid James, and other characters in the *Carry On* films of the 1950s and 1960s may well have helped form the British public's perception of ambulance staff with ambulances rushing patients to Hattie Jacques at the local casualty department. Indeed the 1966 comedy, *Carry On Doctor* portrayed a similar image, albeit with Frankie Howard as the patient and Peter Gilmore as the ambulance driver. To make matters worse, 'Sid' could easily have been delivering milk a matter of days

previously, to the same address from which he now found himself having to deal with a seriously ill patient. The transformation to 'ambulance driver' was indecently hasty, and dependent only on agreeing to obtain a first aid certificate within the first year of his new employment. A 1963 *Panorama* documentary exposed the inadequacies in the nation's ambulance service and this report, together with images such as those provided by the 'carry on team' may have helped attract governmental attention.

Local authority officers frequently provided managerial and administrative support, there being little consideration of a proper career structure for ambulance staff. Few advances in technology were exploited, radios were not generally available and vehicle design remained largely in the traditional mould, with basic van conversions. A few of the wealthier services operated Daimler ambulances that at least offered a relatively comfortable ride. The common state of ambulance development was summarised by Bothwell (1968) in a conference at the Institute of Mechanical Engineers, and in an article produced for the Medical Officer Magazine. He described ambulances as often being *"designed without the least regard for the effects of illness or injury"*. (p. 366) Many authorities, studying the clinical implications of poor ride quality on patients' medical conditions testified to adverse effects and the "mortality of the ambulance ride". Regardless of the many limitations placed on ambulance staff, i.e. poor training, minimal equipment, ill designed vehicles, little leadership or support, and, of course, very low pay, many millions of patients were treated with compassion and skill. Furthermore, it was the experience gained during this period that would lay the foundations for future development.

During the immediate post-war period and for some years thereafter, medical involvement was negligible, although paradoxically, GPs were widely available day and night to patients who became ill whist at home and indeed, the duty to provide this facility remained a part of the GP's contract of employment until the late 1990s. Authority Medical Officers had a duty to oversee ambulance services. For patients suffering serious injury, e.g. road traffic accident casualties, there were a small number of exceptional individuals like K C Easton, a GP in the North Riding of Yorkshire actively becoming involved in improving matters. Easton had recognised the need for change some years earlier while undertaking national service with the RAF. As early as 1949, he had organised emergency medical aid for road accident victims while stationed at Catterick.

After moving to Yorkshire, Easton set up the Road Accident After Care Scheme (RAACS) that provided direct medical support at the scene of accidents in support of the ambulance service. The RAACS brought the skills of clinical assessment, together with the ability to provide endotracheal intubation, intravenous (IV) infusion and pain relief, directly to the roadside. These models of care later spread slowly to other areas of the UK, evolving into the British Association of Immediate Care (BASIC) in 1967, an organisation, which is still in operation today in some parts of the country. It has, however, not proved to be a model of operation that has found favour in most developed, or indeed developing, countries, many of which have adopted an approach that improves the capability of ambulance, paramedic or, in some cases, nurses, as acknowledged medically-based and hospital-supported services.

The reasons for this are not entirely clear, although in much of Europe paid medical services are available (the FGM) and in the English-speaking world, the Anglo-American approach tends to prevail, for the most part, with medical input focusing at the 'directional' level. Interestingly, the 1974 House of Commons Employment & Social Services Committee's sub-committee on A&E Services did recommend allocating public money for the purpose of supporting such schemes. However, this request was subsequently rejected.

"The department do not feel able to allocate from limited funds available to its resources to an area where the benefit is not as yet proven." (In Observations on the fourth report (CMND 5886) 1975. HMSO London, p.2)

The Medical Commission on Accident Prevention (MCAP) was also asked to evaluate the efficiency of GP and ambulance [paramedic] schemes. The research was never carried out and analysis as to the cost effectiveness of advanced surveys for ambulance staff was not conducted until 1984.

For many years, ambulance services remained substantially unimproved, the old mindset continuing to regard them as little more than a means of transport. Training remained at an elementary level although some local authorities did support training schools. Circumstances differed little in the United States where morticians from commercial funeral homes continued to provide a high proportion of ambulance transport, using hearses well into the 1970s. In other areas, voluntary rescue squads also continued to operate and are still a feature of American EMS today. However, not all of these units have the capability to transport patients.

It was not until the 1990s that most American cities' Municipal Fire Departments had an EMS response capability but, again, not all would involve the use of ambulances. Until the 1970s, the usual pattern of staffing was to use fire fighters with various levels of training, from basic first aid level, to provide some level of first aid response often coupled with a rescue and extrication role. The previous practice of using interns and ambulance surgeons had ceased during the war years due to the demands of military medical services and was never reinstated. In a *New York Times* article of 25th January 1948, the City Hospital Commissioner, Dr Berneker, supported by Major La Guardia, stated that the service was more “efficient and satisfactory than ever” and that there had been a reduction in unnecessary calls to home addresses. The situation was somewhat different in parts of West Germany and France where medical involvement in ambulance services such as Gögler, working in Heidelberg, and others, employed senior medical students and qualified medical staff to respond to serious medical emergencies and to accidents. These efforts were designed to fill what Gögler described as the [pre-hospital] “therapeutic vacuum”.

In Britain, the inferior state of the Ambulance Service continued to go largely unnoticed. The expectations of the public, the medical profession and politicians were uniformly low. In 1952, when a major rail crash occurred in Harrow, in which 112 people died and many more were injured, the degree of inadequacy of the civilian ambulance service response was plain to see. American Air Force medical personnel who were mobilised to attend the scene, were infinitely more effective, being properly equipped and trained to provide a high standard of care. Ambulance

men and women were simply not trained or equipped to meet the challenge of providing adequate resuscitative support to the seriously ill.

Improvements in the understanding of the pathophysiology of shock, and resuscitation took place in the 1950s. Kouwenhoven and colleagues demonstrated that expired air resuscitation (EAR), developed by Safer and Elam, could be combined with closed chest cardiac compressions. When applied together, these techniques could provide a “protective plateau” to victims of cardiac arrest. Kouwenhoven also researched defibrillation, confirming previous work by Zoll that had indicated that ventricular fibrillation could be reversed using an electrical counter shock, the first successful human resuscitation being reported in 1955.

At least in the UK, these scientific advances took place in the context of a newly socialised health-care system, which included ambulance provision, with formal medical input at the local medical officer level. Few of these individuals appear to have taken much interest in the Service, with notable exceptions in Brighton and Staffordshire. Nevertheless, there was a degree of central control, interest and funding, hence the English Ministry of Health’s [and indeed the Scottish Home and Health Department] commissioning of a national working party into ambulance equipment and training standards. This [Millar] report provided a framework for ambulance service delivery for four decades and its legacy is still apparent in terms of the many staff who continue to serve today, and who were the beneficiaries of the training programmes developed by this committee. In Europe, at about this time, a number of medically staffed ambulance services were being increased, whilst in the

United States, the range of services, voluntary, private sector and locally funded remained extremely eclectic. However, the National Academy of Sciences' report into traumatic injury quantified the situation in epidemiological and statistical terms, laying a foundation for further development.

Neither the American Academy of Sciences, nor the Millar Committee foresaw the development of paramedics who, by this time, were already in existence in the United States military in Vietnam. It has been estimated that, during this period, the American public suffered a casualty rate 50 times greater than US forces in South East Asia, a staggering statistic which takes into account only deaths and injuries occurring from road traffic accidents. Many authorities have praised the competency of the military medical services in Vietnam and testified to the role this conflict took in shaping the developments of civilian ambulance services.

The late 1960s witnessed rapid progress in pre-hospital care on both sides of the Atlantic and beyond. The Americans had the advantage of increasing Federal interest and, with it, substantial funding. The Department of Health Education and Welfare (DHEW) acted as the most important lead agency, guiding many of the resulting projects. Research activities were supported together with feasibility studies, and demonstration EMS Systems were established. More evidence gradually emerged as to the wastage of life caused by traumatic injury. Frey 1969 estimated that 15% of casualties were dying at scene unnecessarily from treatable but untreated injuries. Widespread improvements were clearly required both inside and outside hospitals.

Improved on-site care was one of the key responses, with other approaches such as improved vehicle design also gaining prominence through the work of lobbyists such as Ralph Nader, further raising the profile of the need for change. Further development occurred in 1973 in the form of the Emergency Medical Services Systems (EMSS) Act. A systems approach was advocated defining the 15 essential components of EMS. The impact and legacy of this halcyon period of progress in North America, and the costly but medically valuable experiences gained in Vietnam, can still be seen in the 21st century. Many of the world's leading examples of EMS and a high proportion of academic research into EMS, occurs in the United States to this day.

V.9/ The Origins of Paramedics

The origins of the term ‘paramedic’ are anything but clear. Certainly there are well known military antecedents already discussed in the context of the Vietnam War and many earlier conflicts as well. Indeed, the idea of a medical assistant, often with quite extensive clinical responsibilities is not new. The medical staff within the Roman Army have already been discussed and both the Royal Navy and the British Army had such staff in the 17th and 18th centuries termed ‘loblolly boys’ (a role subsequently adopted by the US Navy) and ‘regimental mates’ respectively. The Prussians developed the ‘Feldsher’ concept, more often associated with Russian, Eastern European and Chinese health care systems, but which are also found in many African countries’ health care systems.

When considering the Vietnam conflict it is uncertain whether at first, these military medics received additional training due to a change in official policy, or if the innovation was the result of the individual initiative of battalion medical officers and others. Some suggest that the term initially related to those medics serving with the airborne forces. Neither do dictionary definitions clarify the situation, the concise Oxford English Dictionary describing 'paramedical' as supplementing and supporting medical work. This definition, when considered in the context of the registration of paramedics in the UK, lacks specificity.

Paramedic: Webster's Timeline History 1968-2007 adds surprisingly little to any detailed analysis of the subject.

When paramedic type training began in the UK, a variety of titles were used to describe ambulance staff who had undergone periods of medically supervised training to increase their role and clinical capability. Descriptions used included 'Additional Training', 'Extended Training', 'Further Training' and 'Advance Training'. The word 'paramedic' was resisted by many, including unions, managers and many staff, only coming into general usage in the late 1980s, although closure of title only took place in July 2003 after paramedics achieved registration in November 2000. The title of paramedic was originally defined in the Prescriptions Only Medicines Act as an individual who has been awarded the NHS certificate in extended (paramedic) skills. This definition has now been amended to those registered with the HPC (whose name changed on 1st August 2012 to the Health and Care Professions Council to better reflect the diversity of professions within its regulation).

What is a little clearer is the emergence of particular examples of civilian rescue services who trained their personnel in advanced life support (ALS) skills. It is generally agreed that the first such pilot site was initiated by Dr Eugene Nagel, an anaesthetist working at the University of Miami. Nagel was also a qualified electrical engineer who was interested in developing 'physician surrogates' operating under medical command with instructions passed by radio. Several fire fighters from the Miami Fire Department were trained to operate in this way, commencing operations in March 1967.

Many similar schemes came into existence during the next five years including the well-known Seattle Fire Department's 'Medic One' programme led by Dr Leonard Cobb, which is still regarded as a leading example of practice in the world today. A scheme in Dublin, training ambulance staff in defibrillation, was also under way during these early years, but is much less well known and did not lead to the rapid developments of paramedics in Ireland, which was delayed until late 2003. The Pittsburgh 'Freedom House' ambulance service was supported by Dr Peter Safer and later by Dr Nancy Caroline, who wrote the first national curriculum guidelines under contract to the Department of Transportation.

Although both these key personalities have now passed away, their legacy remains, as does the National Highways and Traffic Administration (NHTA), which remains active in developing EMS. Two slightly different pilot sites were started in Los Angeles, pioneered by Dr Walter Graf, a cardiologist from the Daniel Freeman Hospital and Drs Michael Criley and James Lewis, from Harbour General. Operating

in cooperation with both the city and county Fire Departments, the Harbour General programme soon attracted the attention of the National Broadcasting Corporation (NBC) which commissioned a television series entitled *Emergency* based on the work of the fire-fighter paramedics. The television show was an instant success capturing the imagination of the public and ensuring that paramedics entered the consciousness of the American public at large. James Page, a Fire Chief in Los Angeles, as advisor to the programme makers, became an influential advocate of paramedic systems and remained active in promoting paramedic lead care until his death in September 2004.

The legal status of paramedics delivering invasive care was found to be lacking in the United States and indeed other countries. Although American paramedics function directly under a physician's authority, in what English Law would term a ‘master servant’ relationship, legalisation was still required in order to provide certain procedures and medication. Without such legal protection a qualified (and licensed in the relevant state) doctor, or in some cases, a nurse operating under medical authority, had to be physically present before certain care could be undertaken. The Wedworth-Townsend Paramedic Act was the first such legal instrument passed in the United States that permitted paramedics to provide sophisticated treatment, albeit under radio-facilitated physician direction. As paramedics gained acceptability, many of the previously physician-staffed projects, which sprang up briefly during the 1970s, switched to using paramedic personnel, a pattern repeated across America. In contrast, the situation was slightly less complicated in the United Kingdom, where

prior to regulation in 2000, the majority of paramedics were, and remain, at least for now, employees of the state, operating under the vicarious liability of NHS Trusts.

Many of the early American schemes and at least one UK example in Bristol, incorporated on-site supervision, using doctors to tutor paramedics directly at the scene, and this may be one reason for the many successful programmes that came to act as international reference points. Later direct ‘on-line’ medical control, again generally using doctors, provided instruction to paramedics in the necessary treatment of patients by radiotelephone in the United States (Paris, Roth, and Vincent, 1996). However, this sort of technology was never popular in the UK. The reasons for this are likely to include cost, the availability of medical staff to act as a reference point and a belief that clinical practice guidelines, which were initially very limited in the UK, would provide sufficient assurance. Paramedics in America and Canada are viewed as ‘physician extenders' or physician surrogates with the ‘intelligence’ for direction vested in the ‘medical command physician’, whereas this direct relationship was never as explicit in the UK. Nevertheless, this trend of ‘remote medical control’ proved time-consuming and was not always effective. Some commentators have criticised its use, due to the inevitable repetition of procedures, opportunities for erroneous instructions, at a time when paramedics were becoming more skilled and practised. Legal issues are cited as perhaps the primary reason for its use (Goldberg, Zanutcke & Koenigsberg, 1990).

Concerns were also raised regarding the failure of medical direction to always appreciate the environment in which paramedics worked and consequently, as the

early medical pioneers were replaced by newer, but by definition, less experienced medical practitioners, a trend towards the use of ‘standing order’ took hold (Holliman, Wuerz, Vazquez-de Miguel & Meador, 1994). It has also been acknowledged that, even in the few American systems where doctors continued to have a ‘field’ role in responding to emergency calls outside the hospital, this was more about the individual training benefits such opportunities provide than about the clinical need for doctors at scene. The Pittsburgh EMS Fellowship programme makes the point in their promotional material that the purpose of a programme is to prepare physicians for leadership roles in managing EMS systems.

While these developments were taking place in centres across the United States, a parallel series of initiatives to develop another new practitioner termed the Physician Assistant (PA) was also occurring, often using the same substrate, former military medics. For 40 years, these two groups of staff have developed along entirely different career trajectories, with PAs firmly embedded in the health care system, closely linked to a named medical practitioner and usually benefiting from university-based education programmes. Paramedics in the United States were more clearly aligned with public safety rather than health care, and often schooled in a training-oriented programme that concentrated on reacting to acute illness and injury with the appropriate skill set.

At face value, these two new health care workers might appear to have no relationship with one another, but closer examination reveals a possible trend towards convergent evolution. Any analysis of the current clinical workload of

paramedics in the United States or the UK, and probably elsewhere, reveals that the demands profile serviced by emergency ambulance services actually contains only a relatively small percentage (approximately 10%) of life-threatening cases. Traditionally, this is the rationale upon which the whole basis of paramedic education and training is based (Newton, 2012). Today, there is a gradual dawning of recognition that the preparation of PAs or a subset of PA skills would enable paramedics to respond more effectively to today's challenges. Currently, demands and projects such as the Paramedic Practitioner appear to substantiate this view. Issues relating to both increasing demand and the role of paramedic practitioners and similar are addressed later.

V.10/ Developing Paramedics in the UK

The role of the MCAP and its Chair, Dr Bernard Lucas who was a qualified engineer before studying medicine, which perhaps gave him a particularly broad perspective, has already been briefly described. However, the clear-sightedness of the committee is hard to underestimate and the proposed application of advanced resuscitation to enable ambulance staff to discharge their 'complex responsibilities' in a civilian setting, represented a major philosophical change, taking practice well beyond that proposed in the Millar report only four years earlier. The committee probably sponsored the first specific book to support this change, *Extended Training for Ambulance Attendants* (1986). Professor Chamberlain and Dr Peter Baskett's

schemes, together with the ‘Wessex scheme’ in Dr Lucas’s own area, are leading the way.

The focus and content of individual schemes often differed, reflecting local medical opinion, but the original projects shared the essential features of strong medical direction and absolute commitment from a sub-set of ambulance staff and these were the keys to local success. In 1973, the NHS Reorganisation Act, implemented on 1 April 1974, transferred local authority control of all ambulance services, including the few remaining operations working under fire brigade control, to the NHS. This caused a massive upheaval and a reduction in the number of ambulance services.

A new system of performance monitoring was introduced, based on response time, to be known as the ORCON standard, an acronym for ‘operational research consultancy’, developed by the Cranfield Institute. The number of advanced training programmes gradually increased but very few could compare with their counterparts in the US. Dr Sandy Kuehl, the Medical Director of the New York City EMS system at the time, examined the LAS’ interpretation of advance training and concluded that basic life support personnel were merely being provided with extra skills of intubation and infusion. The Department of Health and Social Security remained cautious, and recommended that ‘ambulance authorities defer the introduction of further schemes’. In the health circular LHAL34/73 (73 indicating the year), and again in HN(76)204, the official position was made clear. The 1976 communication states:

> There is as yet no firm evidence that such schemes have made a significant contribution to saving life. The Department therefore recommends that these schemes should continue to be regarded as experimental and pending further evaluation should not be extended at present … (p 3).

Even in the United States, not all was well with some of the now burgeoning number of paramedic-staffed programmes. Caroline (1997), one of the architects of the paramedic concept, wrote a robust article describing her fears for the future. She reserved her most strident comments for physicians for failing in their duty to ensure that exacting standards of quality control be maintained:

*"*Physicians who are too indolent or not concerned enough to monitor closely what is happening in the pre-hospital setting …" Caroline also warned paramedics of the danger of becoming "intoxicated with their new knowledge" and advised "humility". (pp 376-378).

Undoubtedly, mistakes and oversights were made in trying to bring the benefits of medicine outside the hospital. Many of the most effective advocates of pre-hospital care had personal experience of the issues involved. They had to overcome the innate conservatism of colleagues, the natural caution and inertia of officialdom, and a shortage of applied research that ensured that decisions could only be made with incomplete information. However, the epidemiology of traumatic injury and coronary heart disease (CHD) was becoming clearer, together with the potential role of pre-hospital care.

Between 7th and 8th June 1979, interested parties came together at Harrogate in an attempt to clarify the way ahead. There was a continuing shortage of statistical data but information was presented by several of the leading systems, including Dr Chamberlain, Dr Baskett and others. The success of individual schemes varied, involving Dr Hampton from Nottingham and Leeds-based Mr Lea, a Regional Chief Ambulance Officer, reporting disappointing results. Dr Chamberlain's coronary care ambulance was able to offer more positive findings.

The Department of Health and Social Security's (DHSS) Standing Medical Advisory Committee determined that a further, more detailed, analysis was required. Subsequently, the University of York's Institute for Research in the Social Sciences was commissioned to conduct an evaluation into extended training schemes. In the meantime, a further meeting took place in Sunningdale, Berkshire at the Civil Service College to establish the first national standard for extended training. Dr Chamberlain, Mr Lea and Mr Furber represented the Ambulance Service, together with M Lilliman, a nursing representative.

The University of York published the results of their study in April 1984. The report's findings were lucid and unequivocal; unquestionably, the conclusions came as something of a shock to many. The paper's author, Ken Wright, had undertaken a cost benefit analysis drawing on the experience gained in the experimental schemes operating in England and in international literature. The uncertainties were acknowledged in terms of the likely benefits for patients, particularly in the context of traumatic injury where "intuitive benefits" rather than hard data had to be considered.

The evidence with regard to the role of extended training in cardiac emergencies was now more forthcoming. Wright was able to access the work of Eisenburg, whose detailed studies into sudden death represent the most detailed and persuasive research of its type. The analysis contained within these papers clearly documented the features of a successful paramedic-staffed medical rescue service. The York report also considered the skill base in which aspiring paramedics should be well versed, and sought the Council of Chief Ambulance Officers' support. This group regarded IV infusion as the most valuable treatment modality. With the benefit of hindsight and more recent research evidence, this choice might appear an odd choice, but reflected the medically expressed priorities at the time.

Health and Social Service Journal, 2nd February 1984

The saving of between four and five lives each year for every ambulance staffed 24 hours per day for 365 days per year, would, the report suggested, be a reasonable and conservative estimate. Economically, this indicated that such schemes were a bargain. Training costs per person were estimated to be only £2,118. Further

hidden benefits were identified through developing a more highly motivated and skilled work force. The important contribution of “enthusiastic clinicians”, and the considerable amount of free time given up by ambulance staff themselves, indicating their personal commitment to the success of individual schemes, was also recognised. The *Health Service Journal* ran a brief article entitled: ‘More than mercy men’. This commented on the York report and noted the more enlightened international approach in developing paramedics. It went on to state: “We would challenge the negative label applied to most ambulance crews of them being little more than glorified taxi drivers and instead go for positive developments.” (Hyde 1984, p.121.)

The DHSS was not slow to disseminate the finding of the York report. Circular DA(84)12 noted the “somewhat tentative” nature of the study's conclusions but went on to acknowledge that “in principle, the extended training of ambulance staff in certain resuscitative techniques is likely to be beneficial to patients.” The National Staff Council, later to evolve into the National Health Service Training Directorate before being transferred to the Institute of Health Care Development, itself later subsumed into Edexcel and the Pearson Group of Companies, was given the task of developing training materials. Finally, in the same circular, this departmental communication reminded ambulance administrators that “It is for authorities to decide, in the light of their own local circumstances and priorities, whether, and what extent, to introduce extended training or to augment the numbers of staff already trained in advanced resuscitation techniques.” The lights were now set on amber; a green would be seven more years away.

During the 1980s many ambulance services decided to expand the numbers of ambulance personnel trained in advanced resuscitation procedures despite the tepid support from the centre. The new structure of these courses was now codified into a single national model, broken down into three phases of training. This was an improvement over some of the earlier programmes, but certainly not all. Medical oversight was vested in a committee structure, the Local Ambulance Paramedic Steering Panel (LAPSP) with representation from senior clinicians. The arrangements were designed to ensure balance and to utilise a range of medical expertise. In the event many LAPSPs worked well, but the close medical direction that had been a feature of the first experiments, was not always maintained. Nevertheless, substantial advancements were being made across the country. This sense of progress coincided with the timely recognition of the work of ambulance staff through the awarding of the Ambulance Service Shield, to become known as the Crown Badge by Queen Elizabeth at a ceremony at York Minister in 1986.

The Health Service's ability to effectively manage cases of serious trauma was brought into focus during this time. *The Management of Patients with Major injuries,* the 1998 study by the Royal College of Surgeons, London, found shortfalls in the hospital care of the seriously injured patients. Wide variations were also discovered in the proportion of patients who died before reaching hospital, although this report was clear that “experience suggests that more injured patients die from preventable causes whilst in hospital than before they reach it.” Some international commentators levelled criticism at the standards of training among UK ambulance crews. Among them, Donald Trunkey, a leading American clinician, instrumental in

developing trauma services, commented that ‘scarcely any UK ambulance crews had full paramedical training on the American model’. The response from Mr Vernon Jolliffe, representing the Association of Chief Ambulance Officers was predictable, describing this opinion as “ill founded and misguided rubbish”.

The closing months of 1989 also witnessed another brainchild of Professor Chamberlain's come to fruition with the creation of a liaison group networking the Royal Colleges, with particular relevance to paramedic practice and including membership from ambulance service managers. The idea was an effective and farsighted response to the problems of local variation in procedures, the lack of pre-hospital experience among some LAPSP’s groups, and the associated risk of extrapolating from hospital practice. This group became the JRCALC and provided an effective co-ordinating function with access to leading clinicians from a range of Royal Colleges. This mechanism permitted a central source of medical information to be accessed strengthening the application of evidence-based practice for ambulance staff.

In time, JRCALC was able to exert a good deal of influence upon everyday paramedic practice and gradually took the lead role in the development of clinical guidelines, adopting the Staffordshire Ambulance Service's work in this area, authored by Dr Carney. Previously each ‘Trust’ had desired its own protocols and guidelines, but the desire for local control in this area gradually lost its appeal as Trusts began to grasp the sheer scale of the task involved with producing evidence-based procedures. JRCALC was able to reduce wasteful duplication, having the

ability to catalyse developments in paramedic practice and strengthen the evidence-based credentials of a fledgling profession.

As the 1980s drew to a close, the Ambulance Service could look back upon a decade of increasingly steady progress. Increases in demand and the impact of the Naylor report, dealing with patient transport services (PTS), had been absorbed and the latest NHS reorganisation had survived. The work of the service had been symbolised by the awarding of the Crown Badge by the Sovereign. New technology had been introduced to some services in the form of computerisation of control centres that provided opportunities to improve the standard of service with better management information. The tiering of services had been accomplished in many parts of the country. Training and equipment standards were higher than ever before and experiments were under way using helicopters and a variety of first responder units, including motorbikes to speed paramedics to emergency calls. In retrospect, the 1980s proved to be an unprecedented period of progress. Underneath this façade, however, lurked many unresolved tensions. By 1989, it became increasingly evident that a series of industrial relations problems faced the British Ambulance Service nationally, with pay becoming the headline issue, but with many other concerns unresolved.

V.11/ Discontent and Professional Awakening

The dispute that followed during the winter of 1989–1990 proved to be the bitterest ever fought between ambulance staff, the employers and Government and has been recognised as unique in British industrial relations, principally for the level of public support it generated. Media attention was ubiquitous; ambulances blockading central London made for good news footage. Nightly news updates featured three leading protagonists, one being the Right Honourable Kenneth Clark QC, the then Secretary of State for Health, whose famous comment that ambulance staff were merely professional “taxi drivers” proved highly inflammatory. Duncan Nichol, the NHS`s Chief Executive, and Roger Pool the leading negotiator for the trade unions, also proved to be rather effective being described ‘leaden footed’ in Conaghan’s analysis of the disputed *Coach and Horses* (2010).

The police and voluntary aid societies were recruited to operate a makeshift ambulance service. However, it soon became apparent that additional resources would be needed particularly in the larger metropolitan areas. In consequence, troops were brought in to fill the shortfall, primarily drawn from the Army, but also with representation from the Navy and the RAF medical establishments. The standards of training between both the military and non-military groups soon attracted comment from senior members of the medical community who had more insight than most regarding the effects of the dispute upon patient care.

The following letter, written by two of the most senior medical figures involved in Emergency Medicine, Dr Williams, President of the Casualty Surgeons Association and Dr Glucksman, Chairman of the London A&E Consultants Group, appeared in the press describing the seriousness of the situation.

> Sir, it is now four weeks since the ambulance pay dispute began to affect the emergency services in London and there are many signs that the pre-hospital emergency health service is becoming increasingly precarious throughout the country. No less than 50 percent of 999 patients are being transported to hospital by police cars or vans, whilst the Army (30 percent) and the LAS (20 percent) share responsibility for the rest.
>
> These contingency arrangements may appear to be working, but it is only ambulance crews who have the requisite training skills, equipment and vehicles to provide an acceptably safe civilian service. The current system of pre-hospital care is therefore causing distress to many and danger to some, and there are also doubtless those whom it has completely failed. That people are not lying in the streets is no consolation.

The letter went on to urge both sides to move to a rapid resolution. The public provided massive psychological and monetary support for ambulance staff, which enabled many ambulance men and women to continue their industrial action without incurring disastrous financial consequences. One of the reasons for this fidelity was

a feeling that injustice was being done to ambulance staff. It was also recognised that many ambulance crews, although suspended, were endeavouring to operate a minimum level of service using their own vehicles in response to direct calls from the public, and sometimes from the police.

In an article entitled: Third among Equals: An Analysis of the 1989 Ambulance Dispute which appeared in the *British Journal of Industrial Relations* one year after the conclusion of the dispute, Kerr and Sachdev (1992) described it as the most important industrial conflict since the miners' strike which occurred only four years earlier. Indeed, NHS officials described it as "the miners' strike for the NHS". Kerr and Sachdev noted that, while its aim was redolent of many similar disputes, the tactics were revolutionary in that staff declared themselves suspended, not on strike; hence the action was always referred to as a 'dispute'. Response to such media-worthy incidents, such as the Deal bombing and large-scale motorway incidents that occurred at the time, reinforced a positive image. The dispute also proved to staff that their work was valued, a direct contrast with the earlier findings of the 1979 Clegg Commission that reported that [ambulance staff] "believe that society does not recognise the importance of the ambulance service".

To some extent the respective attitudes and public personas of the key protagonists helped the public make up their minds and in many cases actively supported ambulance crews; Mr Clarke was described as a bully in media reports of the time and Roger Pool, the chief union negotiator, who appeared conciliatory, appearing like a 'company manager'. Duncan Nichol, the NHS's Chief Executive during the

period acted as chief negotiator for the NHS. Subsequently reflecting upon the events, he described the dispute 'unnecessary', but did accept that "the dispute concentrated minds and gave the impetus that was needed. It is now clearly recognised that early action by properly trained and equipped staff at the scene of accidents and emergencies can save many lives." The penny had finally dropped.

When a settlement was eventually concluded in 1990, the Ambulance Service was at the threshold of yet another metamorphosis.

V.12/ A New Beginning

Health care reform had been a major area of public policy in the late 1980s but had caused relatively minor perturbations and inconvenience to the Ambulance Service in comparison to the scale of the changes that would arrive in the 1990s. A crisis in the NHS had resulted in a far-reaching government white paper mapping out the way ahead for health within the NHS. *Working for Patients* (1989) heralded a complete change to the NHS landscape by creating a fundamental division between the purchasers and the providers of health care. All ambulance services were destined to become Trusts, self-governing administrative organisations designed along business lines. *Working for Patients* made a number of key proposals including the instigation of a 'medical' audit which most ambulance services managed to successfully avoid during the early 1990s.

The process of converting ambulance services into ‘Trusts’ was enlivened by periodical public failures such as the LAS’ computer failure, which did not instil much confidence in politicians and slowed the pace of acquiring Trust status. This particular cause célèbre received international attention when the newly installed computer-aided dispatch system dramatically failed, causing ambulance chaos for three days. Many emergency calls were lost and long ambulance response time delays were reported, several receiving attention from the media. Allegations were made regarding a number of deaths, but these were never fully substantiated; although, if no deaths could be attributed to the effective loss of the capital's Ambulance Service for three days, one might question why such an institution existed. The inevitable report enquiring into the debacle was anything but electrifying stating, in rather lacklustre tones that *“*neither the System itself, nor the users, were ready for implementation.” The unfortunate Chief Executive John Wilby exited [with some dignity] after a very public resignation in the full glare of national television, but many others closely involved with the project continued in their careers with less damage to their promotion prospects or pensions.

In the years that followed, the LAS spawned a veritable industry of reports and enquiries as politicians fretted over public performance failings, each pored over in the media and each involving an unfortunate patient episode. Some of these failings were particularly tragic, such as the case of Nassim Begum, who died after a long delay waiting for an ambulance, despite relatives making four calls for assistance. The junior minister responsible for ambulance services at the time, Tom Sackville, described the incident as ‘astonishing incompetence’ and the media lavished yet

more unwanted attention on the LAS. Neither was the LAS alone; as the decade progressed, there were regular appearances in Hansard. Several other trusts would be forced to entertain roving bands of enquiry teams and, ultimately, all trusts would be subject to the scrutiny of the Commission for Health Improvement, which was formed in April 1999. It was superseded in April 2004 by the Health Commission whose clinical governance reviews became very influential in the lives of individual ambulance trusts and acted as harbingers of managerial change.

Nevertheless, in the early 1990s there was a sense of relative optimism among many in the workforce. The dispute had heightened public and political interest in the Ambulance Service and new commitments were made. Among the most important of these was communicated by the Secretary of State for Health. No doubt still conscious that the Ambulance Service was still very much in the public eye, he decided to staff every ambulance in the country with at least one paramedic. The Working Group to the Chief Executive of the National Health Service Management Executive (NHSME) [essentially the NHS national operational management team] met in 1990 and directed the National Health Service Training Directorate (NHSTD) to start accelerating the numbers of paramedic trainees. The target was to be achieved by 1996 and, as a spending priority, was able to attract development funding from purchasers.

The media friendly word ‘paramedic’ was now a respectable term and entered common usage from about 1990, aided by television programmes like Casualty that helped portray a dynamic and positive image of ambulance staff and paramedics, in

particular. To reach the new targets it was necessary to dramatically increase the amount of paramedic training, although inevitably this would lead to a dilution of experience among operational paramedics, a point made by Professor Chamberlain at the time. However, this cautionary note did not change policy and the paramedic training 'sausage machine,' now a veritable juggernaut, rolled on.

The enthusiasm of the time is captured in a paper produced by the Association of Chief Ambulance Officers (1990) which sought to restate the value of total integration within the NHS; a sensible precaution given that, in the same year, the Chief and Assistant Chief Fire Officers Association (CACFOA) had launched a takeover bid for emergency ambulance work. CACFOA's submission stated: "The Fire Service has a well defined role in rescue of all kinds …" although, actually, there was no statutory provision for rescue within the Fire Service Act – even if there probably should have been, a point that was subsequently addressed with further legislation.

Furthermore, the Holroyd (1970) Report into Fire Service Organisation had opened the way for those fire brigades that operated ambulance services to get out of the ambulance business, an edict that was enthusiastically complied with. CACFOA continued: "We believe that there is a need to provide the public with a similar (medical rescue) capability ... We see positive advantages in absorbing this part of the ambulance service into the fire service management and operations structure." (p11) The following year a second assault was mounted. The strategic alliance of the two "functions of fire and emergency ambulance services under a single level of

management would offer the opportunity for a number of resource savings". The Chief Ambulance Officer Community (CAOC) (1991) would have none of it and stood firm.

With the advent of trusts, new and hitherto unknown pressures were placed on ambulance managers. Some took to the new ways, seizing the new opportunities that were presented; others became casualties, a pattern that continued throughout the 1990s and beyond. By the mid 1990s it was becoming clear that many trust boards were becoming relatively uncontaminated with ambulance personnel in an administrative version of 'ethnic cleansing'. The casualty rate among chief executives particularly, but not exclusively, from an ambulance background, began to reach alarming levels, greater than 50% in 1996 alone and no respite was in sight. There was, however, no shortage of willing volunteers coming forward to undertake such dangerous assignments with a steady stream of medical directors to lend medical respectability to the new organisations. Numerous appointments in England rapidly followed the first Managing Director appointment being made in 1992, and by the Scottish Ambulance Service from 1994.

The new Ambulance Service Chief Executive pool was a plural affair with many backgrounds represented, including managers drawn from other parts of the Health Service, the military, medicine, nursing, local government, engineering and general management; even postal workers were represented. That such pluralism was necessary was indicative of the failure to develop ambulance staff for positions of senior responsibilities. Paramedic training had now become established, but the

infrastructure necessary to produce competent management with the right management skills, continued to be neglected. The process of progression to trust status was finally completed in 1996 when the London Ambulance Service became the last service to complete the transition.

The most far-reaching changes that occurred during the closing years of the 20th century fell into discrete categories. They spanned both technological issues, such as the new opportunities provided by information technology, priority dispatch, new deployment methods based on evidence-based management and improvements in clinical care. These 'hard' quite tangible matters were complemented by more ethereal, but at least equally important considerations. Foremost among these was the transition of much of the Ambulance Service from an occupation-based workforce to a registered professional group, a process that had started in the early 1990s when discussions were held with the Council of Professions Supplementary to Medicine (CPSM), later replaced by the HPC. Oddly, the nursing profession's, United Kingdom Central Council (UKCC) were also approached as some felt that affiliation or inevitable absorption and takeover might be a sensible option for paramedics. Fortunately, wiser counsel prevailed and paramedics were destined to become the twelfth group of AHPs to become registered health professionals.

V.13/ The New Millennium

The new millennium avoided the often-predicted catastrophic failures of worldwide computer systems, but for the Ambulance Service there was to be an uncomfortable moment under the hostile media glare of the BBC's flagship news and current affairs programme *Panorama*. A series of cases involving ambulance crews that did not appear to have been handled particularly well, were examined with the help of numerous witnesses' testimonies. Inevitably, the examples did not have happy endings. The programme editor then went on to extrapolate these findings to claim that failures in training and organisation were costing thousands of lives each year. Ambulance technicians were labelled as 'basically drivers with first aid training' and this provoked a good many, hotly contested, comments directed at the programme's website. The most serious criticisms repeated and pressed home by David Rose, the programme's main reporter in a statement on the 17th January, were reserved for what he described as 'sluggish' [senior ambulance] management' and their failure to adopt modern methods.

He also lambasted the 'system in which the standards of both technician and paramedic education were low'. It was an uncomfortable moment that many felt had more than an element of truth about it. It also led to a departure of at least one Chief Executive who had perhaps ill-advisedly turned away from the reporter's camera when pressed regarding the absence of a particular 'life saving drug' in his service. Several other press commentators gave even less quarter and even Jeremy

Clarkson managed to ‘put the [metaphorical] boot in’, suggesting that what the public really needed were ‘Damon Hill type ambulance drivers’ who could take patients at high speed to hospitals where people with ‘the wherewithal and the qualifications’ could make a difference. Some years later, his attitude appeared to moderate after his colleague Richard Hammond was rescued by a paramedic-staffed air ambulance following a high-speed accident testing a rocket-powered car. However, at the time and for a service that had moved from obscurity into the limelight with an increasing confidence, it was an uncomfortable experience that touched a nerve.

The first year of the millennium did witness some more palatable key milestones for the emerging paramedic profession, including the registration of paramedics in November. A largely uneventful if momentous occasion which resulted in the formation of a professional body two years later, the CoP. This transition marked the official anointing of ‘professional’ status which, in the UK context, is almost exclusively the preserve of professional bodies or statutory regulators (Lester, 2009).

The period 2002 to 2012 and the relationships to the key objectives is dealt with in detail, with later sections, in particular within the discussion. The purpose of structuring this most important of periods in this way is to capture the key issues that emerged from 2000 and bind them into a wider discussion, thereby avoiding unnecessary repetition and avoiding the risk of conducting an analysis prior to reaching the discussion phase. However, a flavour of some of the important headline changes that occurred during the 2000–2010 period are summarised in Table 5.

Table 5: The Changing Concepts of Operations for Ambulance Services, reproduced from Journal of Paramedic Practice; (Newton 2012)

Table 5: The changing concepts of operations for ambulance services in the UK since 1948			
1948-1960 Dominant Concept of Operation/Priorities	1970-1980 Dominant Concept of Operation/Priorities	1990-2000 Dominant Concept of Operation/Priorities	2000-2013 Dominant Concept of Operation/Priorities
Local Authority provided transport.	Transport (ambulance service).	Transport/emergency ambulances/EMS model.	Transport/EMS model, ambulance aid at technician and paramedic level responsibilities. Some schemes extending the paramedic role (e.g. community paramedics).
Treatment at the first-aid level.	Treatment including gradual development of ALS.	Treatment including development of ALS, with some expansion in the scope of paramedic practice.	Treatment including paramedic ALS with development of paramedic practice. Extension of role with patient assessment/minor illness/injury management. Few schemes prosper.
Civil defence role.	Assessment and triage (usually mass casualty incidents).	Assessment and triage [normally limited to mass casualty incidents].	Recognition that expansion of scope of practice desirable beyond critical care; variable experimental schemes.
			Renewed emphasis upon major incident, anti-terrorist and rescue/'civil defence' role [emergence of a Hazardous Area Response Team (HART) capability].
			Paramedics become registered Allied Health Professionals, leading to higher educational standards and an opportunity to extend practice to meet patient needs.

V.14/ Summary

The primary historical driving force for the development of organised 'pre-hospital' emergency care over the centuries has been human conflict. Secondary reasons include the need to physically remove individuals suffering infectious disease and less frequently, responding to natural and man-made disasters. While many Ancient Civilisations are likely to have had some level of medical care available during wartime, the most widely studied is the Roman Military, who developed a highly organised approach for the care of their Legions. Only much later were these ideas rediscovered and systematically implemented initially for military use, by personalities such as Barons Larrey and Percy during the Napoleonic period and later transposed into the civilian setting.

At approximately the same time, humanitarian considerations came increasingly to the fore, through the work of Henry Dunant, founder of Red Cross and the work of others who helped to encourage the formation of 'relief or voluntary aid societies.' The civilian development of Ambulance Services accelerated in the late 19th Century after the American Civil war, which influenced this trend in both the United States and the British Empire. Other personalities including Jaromir Baron von Monday, in a parallel development helped set the model for Ambulance Services in much of Europe and Russia. The emergence of 'Feldshers,' paramedical type personnel occurred during this period.

Professor Douglas Chamberlain pioneered the first recognisable paramedic training programme in the UK in 1970, although basic ambulance training had been introduced nationally four years earlier. Official endorsement and support was not forthcoming until 1984 when the University of York published a favourable evaluation of early paramedic schemes. A national paramedic training programme was subsequently introduced in 1996. A period of intense industrial strife followed culminating in a national industrial dispute that effectively suspended the UK Ambulance Service for six months. Political attention during this period led to increased support for professionalising the service and encouraging the development of paramedics, who were registered as allied health professionals in 2000. A professional body was formed in 2002 and progress in advancing the scope of practice of paramedics and accelerating the transition from training to education rapidly followed.

Chapter VI

Methodology: Phase A - Questionnaire

VI.1/ Introduction

As this research progressed, the first distinct phase of the investigation emerged:

- Phase A: Assessment of the opinions of ambulance staff regarding education and training methods.

- Subsequently, a Phase B (Horizon Scanning) was developed and this is discussed later in the document.

The activities involved in the latter phase were, to some extent, influenced by the results of Phase A.

This chapter will discuss the emergent research design associated with Phase A of the study and will address methodological issues that the researcher encountered during the research activities related to this phase.

VI.2/ Phase A : Research Design and Methods

This phase of the research was developed utilising elements of a descriptive and exploratory approach, and was conducted against a background of limited published literature focused in the area of pre-hospital care and ambulance services generally. It was also apparent that, at that time, there was virtually no work at all in the area of ambulance crews' attitudes towards their training.

Phase A is predominantly quantitative in design and employed two structured questionnaires, one for Ambulance Technicians and the other for Paramedics, assessing their opinions regarding education and training methods.

VI.3/ Aims

The aim of this part of the study was to investigate the views and opinions of ambulance technicians and paramedics regarding their preparation for emergency care responsibilities.

VI.4/ Objectives

- To examine in what ways paramedics and technicians consider that 'traditional' training prepares them for their professional roles

- To identify paramedics' and technicians' views as to the strengths and limitations of their current training

- To determine paramedics' and technicians' views as to whether their professional preparation should be incorporated into higher education pathways and if so at what academic level.

- To establish whether there are any discernible differences in opinion between paramedics and technicians and within different gender and age groups.

VI.5/ Unique challenges in pre-hospital, ambulance and paramedic oriented research

Research into ambulance and emergency medical services, particularly those in the UK was a relatively new and extremely under-developed area of investigative activity at the time this study began. Even in the United States, which has dedicated more efforts in this area during the last three decades in particular, concerns are frequently raised. Specific areas warranting attention have been identified as: the paucity of skilled researchers, inadequate funding, a lack of integrated information systems and a failure of policy makers and leaders in both the wider health economy and the Ambulance Service in particular to recognise the importance of efforts in this area.

The second issue and challenge was a more personal one and relates to the researcher's own journey and the relationship with the research itself. This

consideration cannot be decoupled from concepts of reflexivity and learning, particularly in respect of the reflective process. Important themes emerging from the research process including revisiting key findings, the future of the paramedic profession and the salient themes will draw upon issues in the literature review and the factors that are most likely to influence future policy and research.

That the research was unavoidably reflexive is exemplified by the need to develop a two-stage format with the second Horizon Scanning element, building upon both the initial research question and the changing environmental circumstances surrounding the emerging paramedic profession, the Ambulance Service and, to a not insufficient degree, the actions of other professions and the Department of Health. In addition, as the work progressed, findings were disseminated in a variety of ways, with publications and other documents being produced [Appendices II, III, IV and V]. These papers influenced the evolving national discussion and at times policy position, for organisations such as the College of Paramedics.

VI.6/ Context and Philosophy

Research traditions influence research design and it is design that sits at the very core of research effectiveness, setting the framework for both the organisation and implementation of any study. Researchers have discrete traditions upon which to draw inspiration or at least influence. Two of the dominant alternatives are constructivism and positivism, which are not necessarily always entirely mutually

exclusive paradigms, but which are generally presented as such. At the outset of this project it seemed likely that a positivist approach would be dominant.

This early conclusion was based on the emphasis being placed upon measuring specific variables objectively to determine specific facts, or at a minimum to quantify opinions expressed by subjects responding to questions raised in a structured questionnaire. Use of structured questionnaires appeared an appropriate method to achieve the stated aim and objectives of Phase A of the research. It is important that methods and paradigmatic choices should facilitate achievement of stated research aims and objectives and afford the researcher the best opportunity to answer any identified research questions (Kreibich, Oertel and Wolk 2011).

The dominant philosophy of this research project can therefore be characterised as being pragmatic in nature (Cresswell, 2007) but, as has been highlighted, also reflective and reflexive in approach, not least because the paramedic profession, pre and out of hospital unscheduled care policy and the attitudes of other professions created a situation of ‘shifting sands,’ or more specifically a situation where many variables changed more frequently than anticipated. The recognition of this fact had a direct influence over the selection of Horizon Scanning as a way of mitigating the perceived instability and as a practical counter-measure, which held out the promise of looking ahead, beyond the somewhat confused picture that emerged at the transfer stage.

VI.7/ Questionnaire Development

As expected, and as with any rigorous design effort, questionnaire development proved to be a convoluted process, with ultimately 11 iterations developed sequentially through a process of drafting, re-drafting and pre-testing. Meetings with “experts” and members of the target population to examine the proposed content enhanced the validity of the questionnaires (Bowling, 2009). The outcome of these activities were subsequently pre-tested and the final administered version is included in Appendix I.

In order to achieve the research aim and objectives the questionnaires comprised a series of sections, each with a specific purpose and collectively designed to provide a range of data sets that could be interrogated to answer the key questions. These included demographic, but not identifiable information, data regarding the origin of the subjects in terms of the route they had taken to achieve ambulance technician or paramedic status. Typically this involved either the direct entry route or passing through other appointments within the Ambulance Service such as working within the PTS, as Ambulance Care Assistants (ACAs) or via control room staffing as an Emergency Medical Dispatcher (EMD). This issue of prior employment was potentially of some significance in respect of the presumed recruitment and workforce planning considerations that were expected to have major implications for the future skill mix within the Ambulance Service.

From the outset a variety of approaches to administration of the questionnaires were considered. It was concluded that a structured postal questionnaire, asking the same questions of each respondent with a restricted range of possible answers, would be most appropriate. The approach of a semi-structured questionnaire allowing for more qualitative responses was considered but, after theoretical and practical research considerations, a structured postal questionnaire gathering quantitative data was deemed to be most appropriate. It is acknowledged, however, that this method has the associated limitation of being unable to produce the depth and detail that might be obtained through the use of qualitative elements. However, while certainly involving a financial cost, structured questionnaires are less time consuming and more economical than qualitative interviews with the advantage of enabling the researcher to collect data from a wide range of respondents in a relatively short period of time. The breadth of engagement is an important feature in the data collection within Phase A.

The chosen method also held the advantage of guaranteed anonymity, given that no personally identifiable data was collected. It also avoids the bias that can sometimes be a factor in interviews (Creswell and Miller, 2000). It is possible to achieve good response rates through the use of effective instructions and clear questioning. Well-designed questionnaires are easy to complete at the convenience of the recipients and detrimental factors can, to some extent, be resolved or mitigated using pre-testing as part of a broader quality improvement process which should be built in to the design phase of projects, as was indeed the case in this study.

Some of the practical difficulties connected with the use of questionnaires were under appreciated and the process of development was, therefore, prolonged beyond what might have occurred with the benefit of hindsight. Examples of the type of changes that proved to be required fall into the general categories of structure, and content, specifically the questions themselves, in addition to the layout and format. Each time redrafting of the research instrument occurred fundamental issues of length, language, layout, and sequencing had to be addressed. Each of these areas required changes. Decisions and choices had to be made and justified, but the driving force was the overall improvement in primarily the clarity of the questions. One other complication discovered during piloting was that interpretation differed between groups.

Negotiations regarding the distribution and the ratios of questionnaires allocated to individual services were made directly with the Chief Executive of the Ambulance Service Association. Again, numbers were based more on what was considered reasonable and achievable, as detailed in section C (Questionnaire Distribution) of Appendix I. However, on reflection this may have had the effect of allocating proportionally more questionnaires to the smaller services, partly at the expense of the larger metropolitan and country based services such as Scotland and Wales. However, this does not mean that the response rate in those areas was any higher.

In summary, the choice of postal questionnaires, for their relative simplicity, enabling contact with large numbers of potential respondents, provided a practical method for acquiring extensive amounts of information without incurring the costs associated

with bringing together participants to partake in activities such as interviews or focus groups. Many researchers including Cutter (2011) and Popper (2004) support the continued use of questionnaires as part of research design for these reasons. This support is partly based on their practicality, their ability to offer standardised questions, their suitability when acquiring large amounts of data for comprehensive statistical and other analyses, qualities which rank amongst their many virtues. Nevertheless, these commentators also offer a note of caution, recognising the equal number of limitations that accompany their use. These include the danger of low return rates, the difficulty in considering complex questions, the danger of self-selection and the risk that some respondents might not be entirely truthful in their answers. While not the perfect accompaniment or solution to the questions raised in this research process, on balance their use does appear to have represented an effective method of seeking the views and opinions of respondents.

VI.8/ Ethical Considerations

According to the University of Hertfordshire's Policies and Regulations (UPR), any research project involving human beings must be granted ethics approval before the study can begin. (UPR AS/A/2). Following a full submission to the Research Ethics Committee for Nursing, Midwifery, Paramedic Science, Social Work and Counselling, ethical approval was granted for this study (approval number NM2000/09 I).

Ethical concerns were addressed through the application of the principles of autonomy, beneficence and non-malificence. In the context of a research exercise,

Naidoo and Wills 2000 have defined autonomy in terms of the ability of each potential subject to make their own decision regarding their individual participation and to ensure that this decision is respected. No pressure or coercion was applied and recipients of questionnaires were at liberty to decline or participate at their discretion. An information sheet, reproduced at the beginning of Appendix I was included with each questionnaire.

The principles of non-malificence, defined as ensuring that no harm would result from the study's activities and beneficence, the promotion of good, or specifically good practice through academic research, were addressed in the accompanying explanatory letter to all participants. Recognition was given to the possibility, although unlikely, that some degree of psychological distress was theoretically possible, given that individuals would, to some extent, have to confront potential deficits in their knowledge base and could relate this to negative perceptions regarding their patient care. This factor was acknowledged in the submission to the ethics committee. As a result of discussions, full contact details of the researcher were provided, including a telephone number in order that respondents had the opportunity to seek clarification on any points of detail and provide a point of contact that could provide immediate support.

VI.9/ Arrangements for data collection, storage and security

A total of 3000 questionnaires (1500 for technicians and 1500 for paramedics) were distributed to the 32 English ambulance services and to the ambulance services in Scotland, Wales and Northern Ireland that existed at the time of this phase of data collection. Appendix I (Section C) shows the numbers distributed to each area. This logistical feat was enabled with assistance from the ASA, the membership body of the 32 [since reduced to 11 from 2013] Ambulance Trusts in England. The ASA, as the membership organisation for all ambulance services at the time of data collection, had a key role in helping and assisting with this research in negotiating on behalf of their member Ambulance Trusts.

Ambulance services in Scotland, Wales and Northern Ireland also received a proportional number of questionnaires. Scotland and Wales received 140 each, and Northern Ireland received 80.

Questionnaires were returned in sealed pre-paid envelopes to the University of Hertfordshire's post room, where arrangements were in place for their initial collection. Each questionnaire was then stored in a locked cupboard within an inner office in one of the university's buildings, to which only the principal investigator had access.

Overall there was a 24% response rate and all the data from these 740 replies were entered into the Statistical Package for the Social Sciences (SPSS, version 15) for data analysis and evaluation.

VI.10/ Data Analysis

For the most part this phase involved a series of explorative exercises utilising the capabilities of the SPSS for analysis. There was an extensive array of data to draw upon and the first task was to generate a large number of files that contained the many sections and sub sections derived from the questionnaires. Consideration was also given to inferential statistics to explore patterns and correlation's, but in the event, the richness of the descriptive statistics were usually sufficient when considering the key themes that are reported in this chapter.

VI.11/ Development from Phase A to Phase B

Having analysed the data gathered through the questionnaires the results showed that, whilst attitudes by ambulance staff to their educational preparation was important, other important factors were emerging. Perhaps most importantly was the question surrounding the future for ambulance staff generally, and paramedics in particular, if other staff groups were moving into similar clinical roles? Furthermore why were these events happening and what factors were influencing these changes? Horizon scanning was assessed as the most suitable medium through which to explore these questions which will be discussed further in Phase B.

VI.12/ Summary

This research project has been developed in two parts, although the necessity for creating a second phase only became apparent as the project progressed.

The focus of Phase A was exclusively the views and responses of subjects, both ambulance technicians and paramedics, to a series of questions that explored the approval and satisfaction or otherwise with their training. The study then progressed to consider the relationship between satisfactions with training, particularly of the ambulance technician cadre in relation to the time these staff spent crewed with a paramedic. Finally, and arguably of most importance, the study specifically sought to establish whether ambulance technicians and paramedics supported a move from what was, at the time these questions were asked, a national series of training arrangements to a more Higher Education based approach.

In practice there were few, if any, studies addressing these issues within the context of ambulance staff, although it was noted that other professions, particularly AHPs and nursing, had undergone a similar process of change from training to an educational approach and that a number of studies had explored the levels of satisfaction with aspects of job role, aspects of supervision and quality of preparation. However, due to the nature of ambulance work, the relevance of many of these studies was questionable. Collaboration with the Ambulance Service Association enabled individual Ambulance Trusts to engage with the study and

ensured that all English Ambulance Services took part to gain the widest access possible.

Chapter VII

Results from the questionnaire based study

VII.1/ Results from Phase A: Views and Opinions of Ambulance Technicians and Paramedics Regarding their Preparation and Aspiration in Terms of Future Training and Educational Opportunities

VII.1.1 Questionnaire Return Rate

The size of the Ambulance Service workforce has grown significantly since the study commenced, but has since plateaued due to unfavourable economic circumstances. Table 6 indicates the return rate among ambulance technicians and paramedics.

Table 6: Return Rate among Ambulance Technicians and Paramedics

	Technicians		Paramedics		All	
Questionnaires	1500		1500		3000	
Valid replies	384		346		730	
Response rate	26%		23%		24%	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Valid replies	261	123	263	83	524	206
Response rate	17.40%	8.20%	17.53%	5.53%	17.47%	6.87%

VII.1.2 Ambulance Staff Demographics

This section includes tables, together with figures and data presented, and includes fundamental material clarifying the gender (Table 7) and age profile of the staff undertaking the survey. Unsurprisingly it indicates that ambulance technicians show a slightly younger age profile, with an average age of 36 compared to paramedics at 40.

Age and gender profiles are important issues, particularly in respect of workforce planning. During the last two decades the Ambulance Service has become more 'gender balanced,' with an upsurge of recruitment from females and this trend can be discerned in the younger age groups. Regrettably ethnic classifications were not included in the questionnaire and, on reflection, this is a limitation within the data, but it is certain that black and ethnic minority representation (BEM), as defined by the

NHS, is below that which would be expected in the population at large. This has been noted as a more general concern, which also results in a lower proportion of representation in managerial grades (Santry 2008). Although impossible to clarify scientifically, it is likely that respondents were disproportionately drawn from the ranks of those staff with a particular interest in career progression and enhanced education and training.

Table 7: Ambulance Staff Demographics

		Male	Female	All
Technicians	Mean[1]	38	31	**36**
	Modal group[2]	31-35	26-30	**31-35**
Paramedics	Mean	41	34	**40**
	Modal group	41-45	31-35	**36-40**

1. Weighted mean based on midpoints of each age group.
2. Modal group is age group with most respondents.

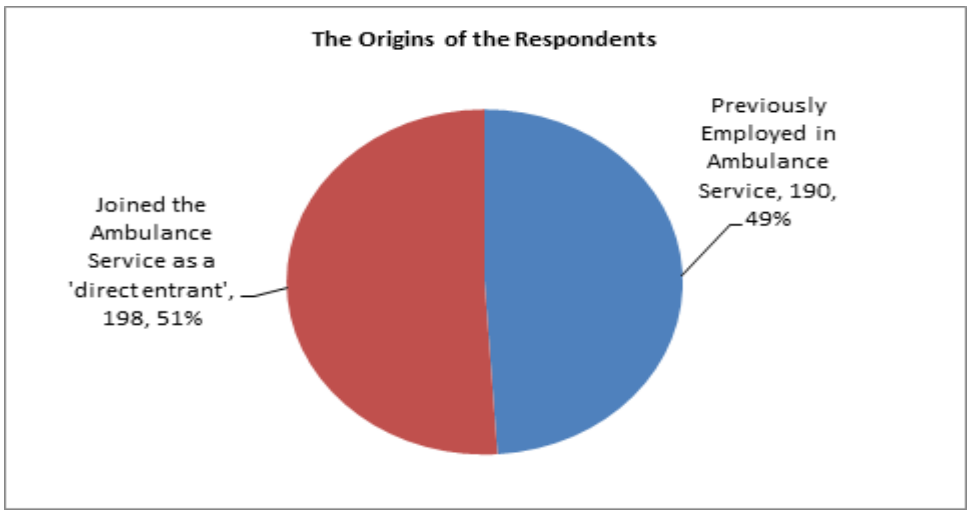

Figure 3: The origins of respondents

Figure 3 shows the percentage split between those joining the Ambulance Service as direct entrants, i.e with no previous service employment record, and staff who

have been employed, typically at a lower grade, either within the control centre or with the non emergency PTS function.

Understandably, both male and female paramedics in this sample tend to be older than the technicians. At the time of the survey, traditional training methods followed a succession, or 'self-improver', route and that involved the technician course preceding the paramedic course. Today the situation has changed fundamentally, with direct entry programmes becoming far more common and these generally graduate young, but qualified, graduates where 'technician skills', perhaps more logically termed basic emergency care skills, are integrated into the paramedic degree course.

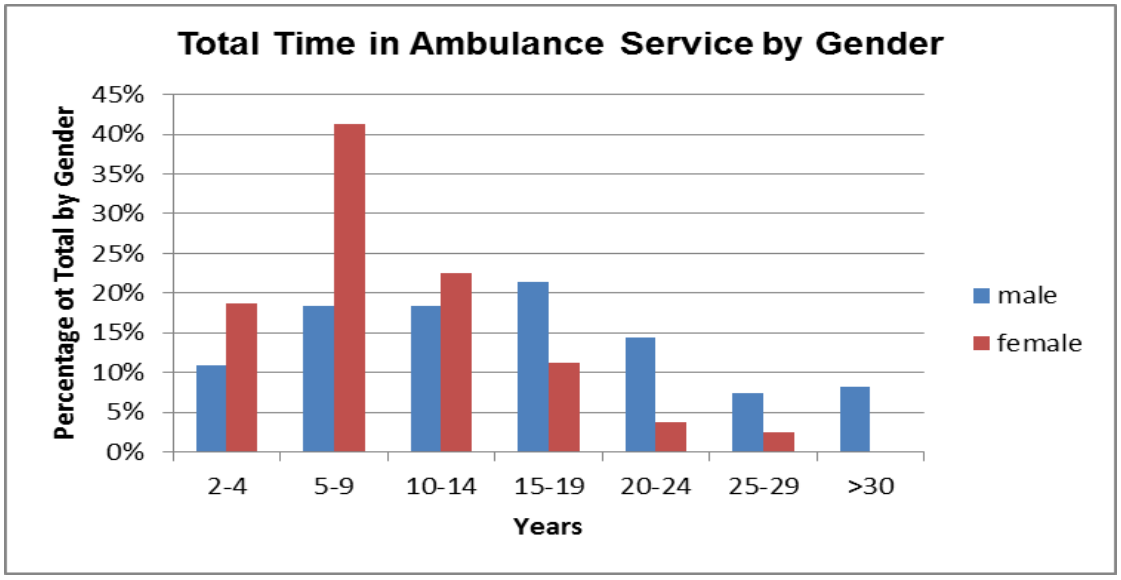

Figure 4: Total Time in Ambulance Service by Gender

Of the 375 technicians who replied, 24% were female and represented a smaller proportion of the workforce than their male counterparts. Figure 4 illustrates the distribution of the total length of service of this population (including previous

employment within the ambulance service, e.g. control or PTS duties) in comparison with the 76% male technician population. A majority of the female technicians in the sample had a length of service of between 5-9 years. The male technician sample are represented more fully over the whole time frame.

Length of Service of Technician Level

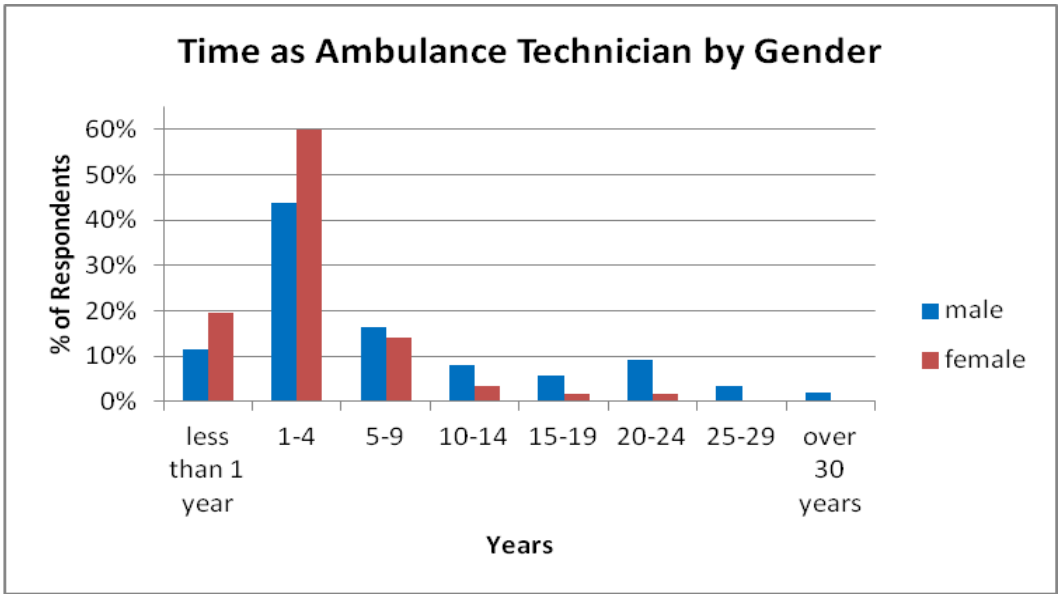

Figure 5: Percentages by Gender Length of Service Ambulance Technician

Figure 5 shows that the bulk of the technician responders had served 1-4 years in that role. For female responders, 60% had served 1-4 years in the technician role. There were very few females who had spent more than 10 years in the role.

Prior to the 1970s, female participation in the Ambulance Service was low, especially so in operational field roles, which is likely to be partly a function of prevailing social attitudes and the availability of work within the service. Nevertheless, it should be noted that as far back as 1940, and indeed during the First World War, women accounted for large proportions of ambulance staff, trends that reduced in the

periods immediately thereafter these conflicts as male combatants returned to the workforce. One other aspect of service change that may be a contributing factor is the use of technology, especially in relation to manual handling, which has been greatly facilitated by the use of hydraulic and other lifting aids. 'Brawn' is certainly less of a requirement today and the increase of the female in the ambulance workforce is accelerating.

The relatively high level of male technician distribution at the 20-24 year point is difficult to explain, other than as a demographic legacy, possibly compromising staff who, for whatever reason, had not sought to undertake conversion and upgrading to paramedic. Changes in entry standards, which have become more stringent, may be a pertinent factor here.

VII.1.3 Length of Service at Paramedic Level

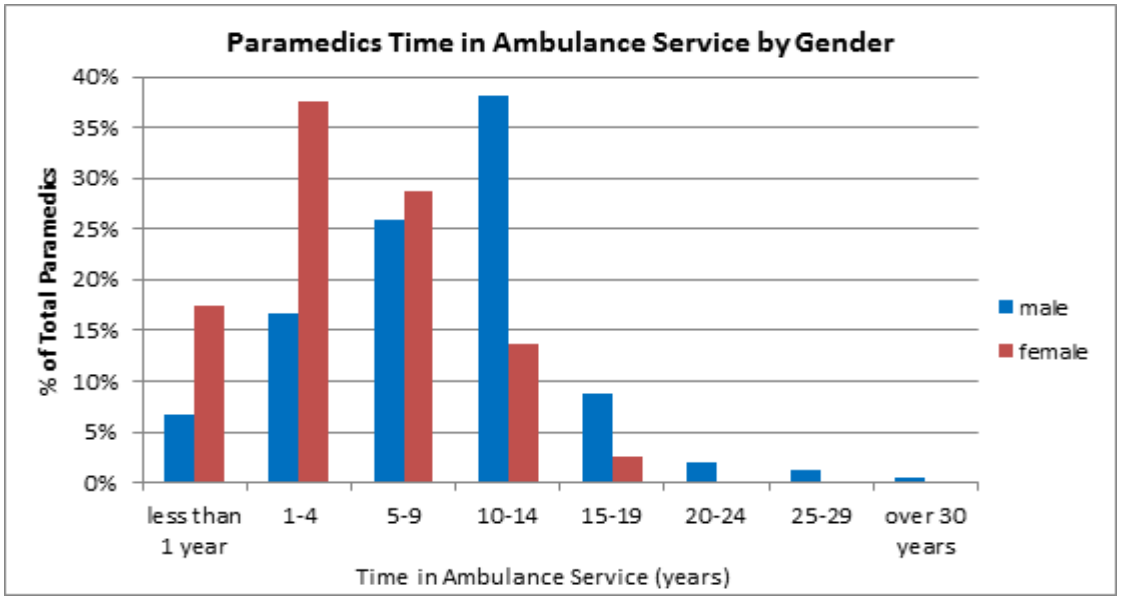

Figure 6: Length of service at paramedic level by gender.

Once again, as with the technicians, the male component of the population is better represented throughout the service length distribution. This may be due, in part, to the more recent expansion of female recruitment into the service. One possibility is that female technicians progress to become paramedics at an earlier time in their career. To confirm this would require further research and will become a legacy issue as female entrants into the workforce continue to increase changing the ratio of male to female employment in favour of female participation.

As can be seen in Figure 6, the male sample population shows a sharp decline after 10 to 14 years service, when the distribution drops off rapidly to the point where there is less than 5% of the male paramedic population with greater than 20 years service. The work paramedics and ambulance technicians undertake can be extremely demanding psychologically and physically and the above finding indicates that it may simply not be possible to continue operating as a “front line” crew member much beyond 20 years for most people. Productivity in the Ambulance Service has also certainly increased dramatically in recent years, with fewer and fewer periods where crews can rest between call outs. Standards of fitness represent an area that might be worthy of future study. Recently opportunities outside the Ambulance Service for example working on a full-time basis in other parts of the NHS, such as GP surgeries or walk in centres may be another source of staff turnover and can be expected to have an ever greater effect in the future for paramedics in particular.

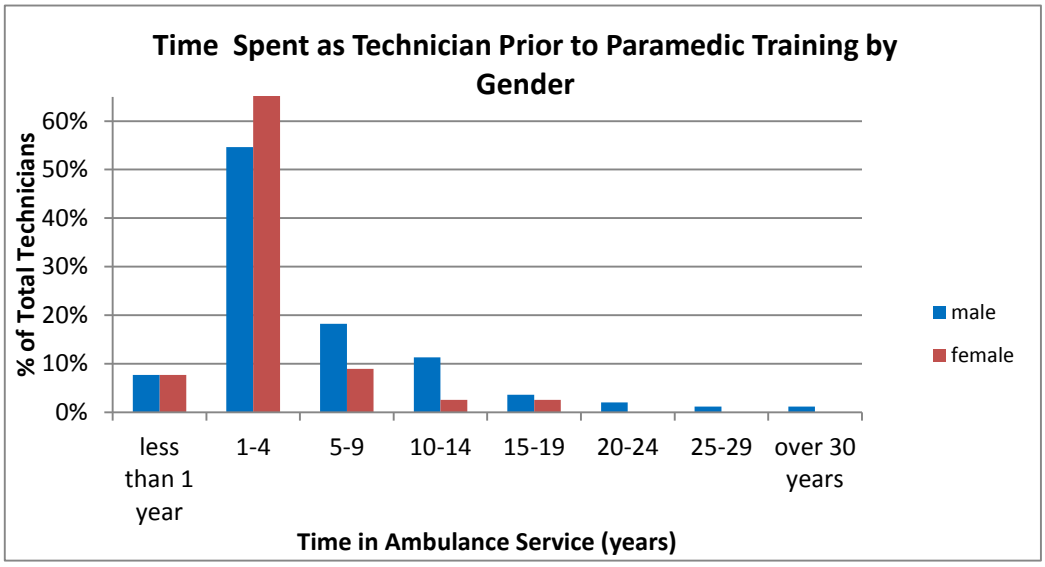

Figure 7: Percentage by Gender Length of Service as Technician Prior to Paramedic Training

Figure 7 Illustrates an interesting feature that the majority of the male and female sample of paramedics work as technicians for roughly the same period of time (1 to 4 years) before training to paramedic level and it is also worth noting that a greater proportion of the female population (>60%) progress during this period. The male technician population, after 'peaking' at the time period of 1 to 4 years 'tails off' in a similiar fashion to their female counterparts, however, a proportion continue in the technician role for, in some cases, decades, before achieving paramedic status.

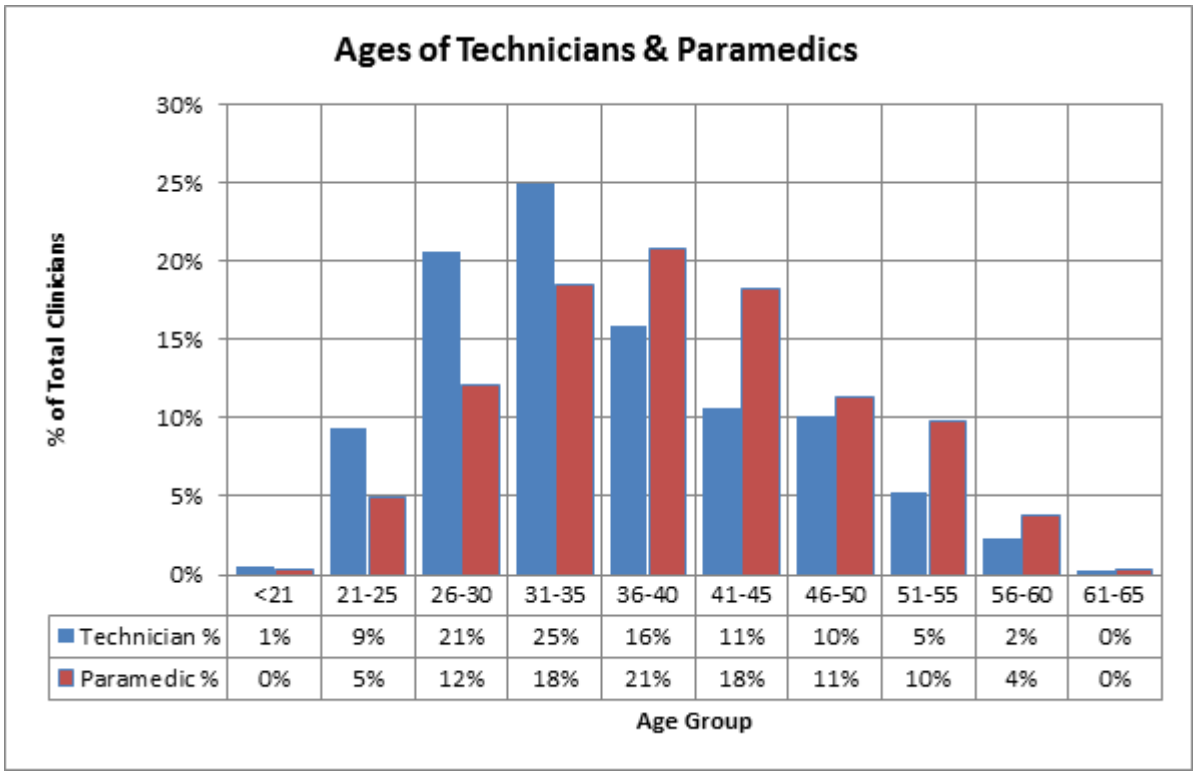

Figure 8: Ages of Technicians and Paramedics

Figure 8 illustrates that 46% of the technicians in the sample are between the ages of 26 to 35 after this age range the population of technicians start to decline. Contrastingly, in the case of the paramedics only around 40% are within the age range of 31 to 40, although around 50% of the paramedic population are in the age range of 31 to 45.

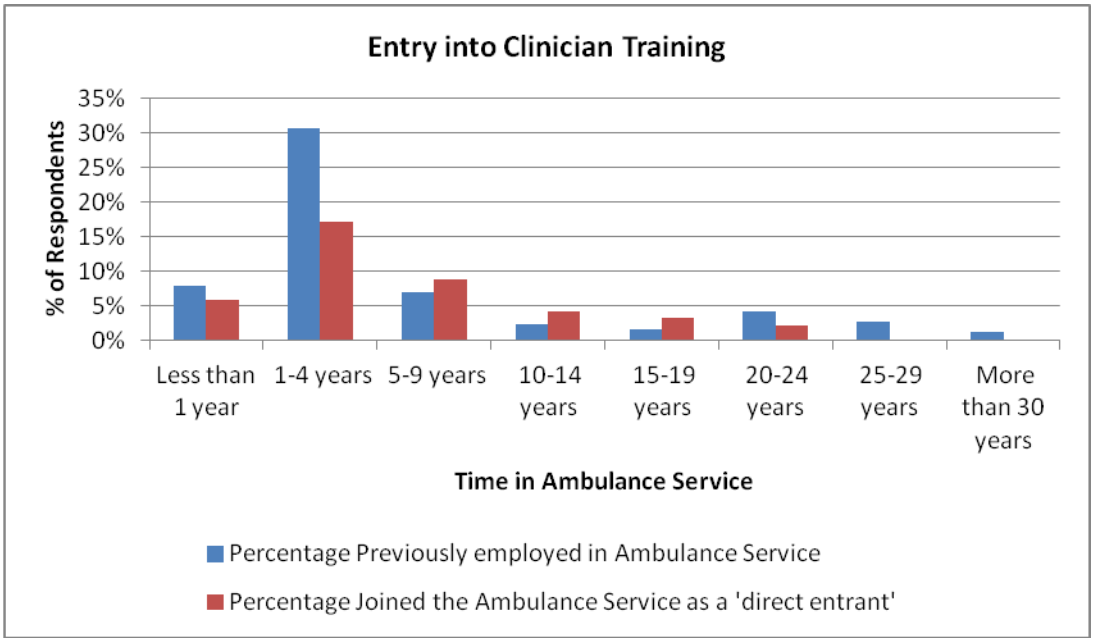

Figure 9: Length of Time as Ambulance Technician by Entry Route (e.g. previously employed within PTS or joining as a direct entrant)

Figure 9 shows that 30% of the sample had previously worked for an ambulance service in another capacity for 1-4 years. This is twice the number of the 'direct entrant' in that category. Notably, at the point where years of service is between the 5 to 14 year period, the 'direct entrants' become the majority by approximately 4%.

When the sample of respondents who were previously employed by the ambulance service are considered these can be split into two sub sets:

1) *'Qualified as Emergency Medical Dispatcher and worked in ambulance control';* and

2) 'Qualified as an Ambulance Care Assistant and worked in the PTS or similar'.

It is noted that both sets have a relatively high population during the 1 to 4 years service category, this feature then declines over the following time bands until years

15-19 of service when there are no longer any of the dispatchers within the data set. This could be due to a number of reasons e.g. all have progressed to paramedic status, career progression into other roles within the Ambulance Service or other considerations.

An interesting feature is in the 20-24 year band where there is a small resurgence of both populations. This could be partly due to people naturally switching careers through personal development. It might be useful to compare this data with national figures for 'switching careers' and the performance of mature students.

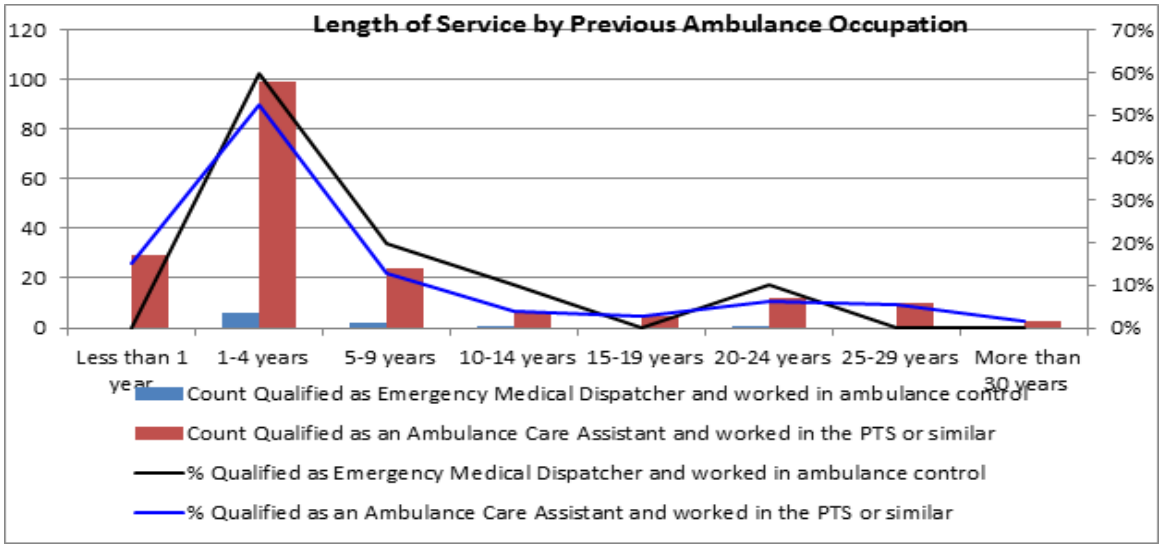

Figure 10: Length of Service as Ambulance Technician by Previous Ambulance based Occupation

The relatively large number of staff who progress to technician status from the Emergency Operations Centre (EOC) (ambulance control) environment could be the result of those who join with no thought of career progression whereas in contrast the ACA often joins for the very purpose of progression through to paramedic. Whatever the cause, it is a surprising finding which seems to be something of an

abberation. Nevertheless it is likely to be a career path in the future, as control room duties are being recognised as more central to the clincial role of the Ambulance Service, with specialist paramedic roles developed to help meet the need for greater clinial focus in what is becoming ‘telehealthcare’ operations, rather than simply ‘emergency call taking centres.’

VII.1.4 Relevance of PTS Experience to prospective Accident and Emergency (Paramedic) Personnel

One question that was asked during the survey that appeared to evoke quite a strong response enquired if respondents felt that staff seeking to work on A&E duties, many of whom would ultimately become paramedics, should serve a period of time in a non-emergency patient services role. By the time this survey was complete, and indeed for the years that have elapsed since, the question seemed progressively less relevant, largely because increasing numbers of paramedics received their preparation via the direct entry ‘university’ route. The practice of joining the PTS and then transferring to A&E services has became far less common, almost to the point of extinction. Largely as a result of the Francis Report (2013), there are now proposals which are being supported by the Department of Health which may mandate a period of health care assistant experience, possibly within the PTS or elsewhere for all prospective paramedics before they are able to apply to join a paramedic degree. This is also and, indeed even more so, the case for nursing staff who would be expected under the new arrangements to spend a year in the health care assistant role. The RCN has strongly opposed this change (British Broadcasting Corporation 2011). The CoP has not yet responded to the proposal. It

is noteworthy, that respondents felt very strongly that this was a useful approach which was supported by 85% of the respondents and is, therefore, a significant result.

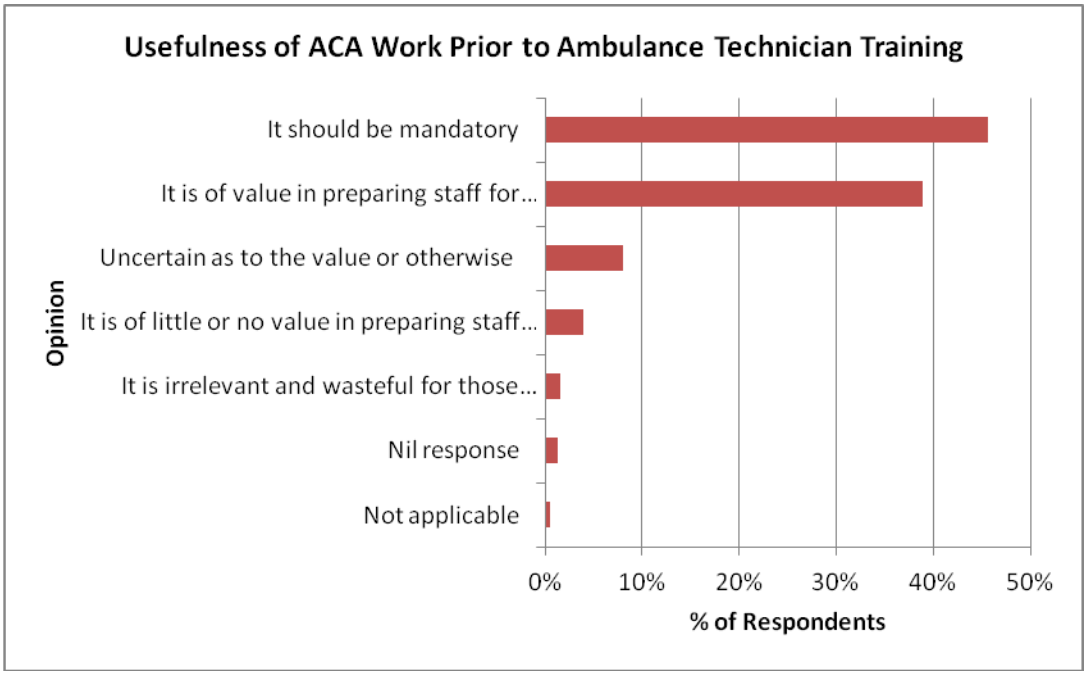

Figure 11: Overall Usefulness of ACA Work

Figure 11 demonstrates that a majority consider ACA work to be a valuable asset to the progression of their career. Overall 85% of respondents considered it to be of significant usefulness prior to progression to technician level. This figure is likely to have been influenced by the fact that many within the study group had followed this route themselves and therefore represents a source of bias.

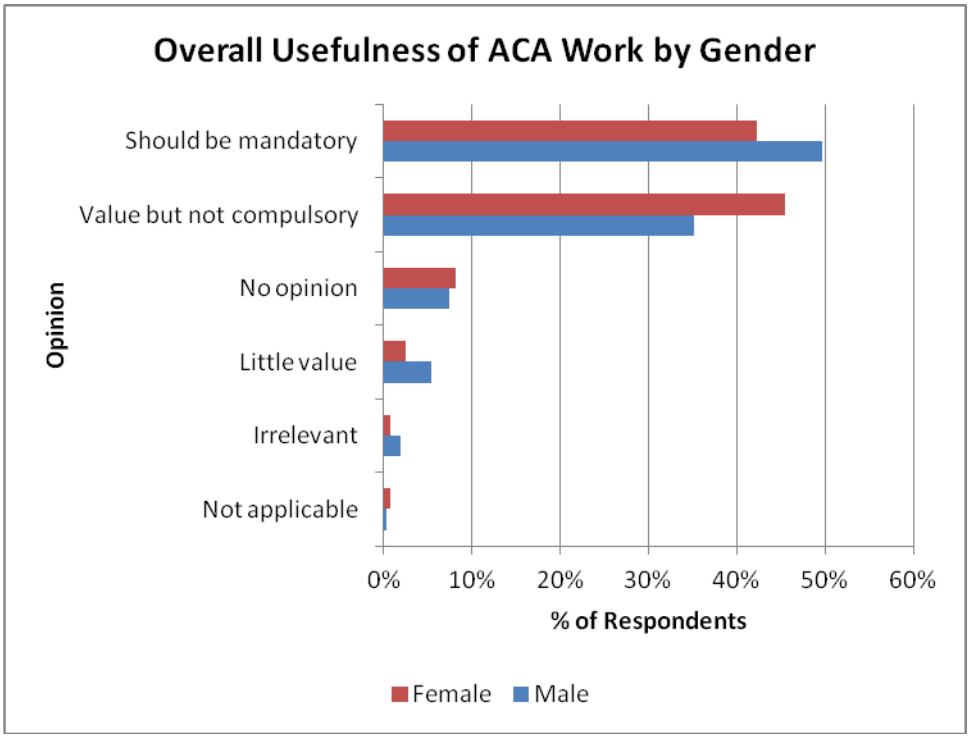

Figure 12: Overall Usefulness of ACA Work by Gender

Figure 12 breaks this down by gender. A larger proportion of the male rather than female population considered the ACA work of such value that it should be mandatory. On the other hand, more females thought it was of value but should not be compulsory.

VII.1.5 Ambulance technician training

Technicians were asked to indicate how adequately their ambulance technician training prepared them for managing Category A, B and C patients. These categories are related to clinical priorities, as determined by the AMPDS to grade 999 callers into three levels of priority. Most, but not all, of the data that relate to triaging, therefore, uses AMPDS which has now been largely replaced by NHS Pathways (NHSP). Where triage related data are presented, the use of either

AMPDS or NHSP has been indicated. Category ‘A’ cases are presumed to be ‘life threatening’ or at least potentially such, as adjudged by the responses received from the 999 informant and the EMD receiving the call in ambulance control. These incidents should receive an emergency response in eight minutes or less in accordance with nationally mandated performance standards. Critical cases such as heart attack, stroke, asthma attacks and other breathing difficulties, severe trauma and other causes of unconsciousness should therefore fall into this Category ‘A’ group.

Category ‘B’ cases [category ‘B’ was subsequently eliminated in 2011, when new national ambulance standards were introduced] were assessed as ‘serious’ and should receive a response within 19 minutes or less. The final category is ‘C’ and these cases are considered relatively minor and indeed contain many patients with minor illness and injury that would traditionally have been the province of primary care. In reality any triage system’s effectiveness in terms of sensitivity falls short of 100% accuracy and this limitation ensures that some patients with more serious conditions do, in reality, end up being mis-triaged to the ‘C’ category.

The most interesting finding here is that respondents report being broadly as well prepared for ‘C’ category cases, as for other categories of call, even though it is well established in the literature that ambulance technician and paramedic training makes little attempt to provide the necessary clinical assessment skills to differentiate these groups safely, an observation that is explored in detail within the discussion section. This is an area that would benefit from further research interest.

Figure 13 illustrates the replies to the survey question ‘how did the training prepare you for the category (A, B & C) calls that you respond to?’.

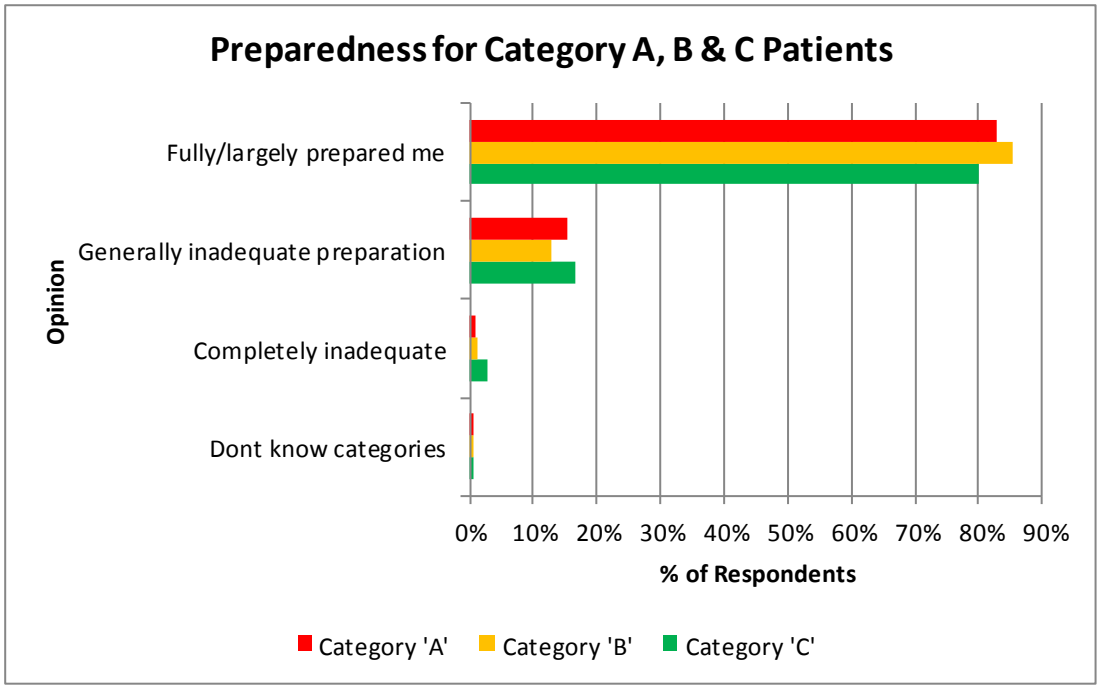

Figure 13: Preparedness for Category A, B & C patients

On the whole the majority of the 375 technicians who responded felt that the training largely prepared them for category A, B & C calls. More concerning though is that a small number of the technicians felt that the course failed to prepare them well at all.

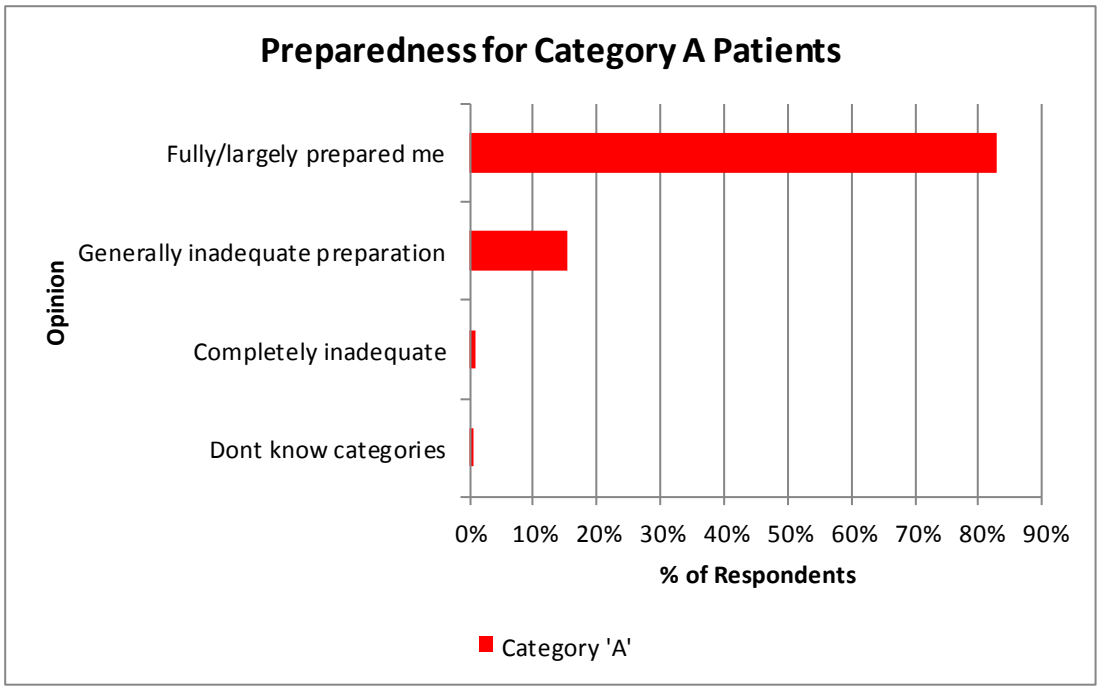

Figure 14: Preparedness for Category 'A' patients

Figure 14 shows that a clear majority of respondents agreed that their training was effective in preparing them for the more serious cases. This is to be expected given that the focus of much ambulance technician and paramedic training is strongly focussed towards the needs of the acutely ill and injured.

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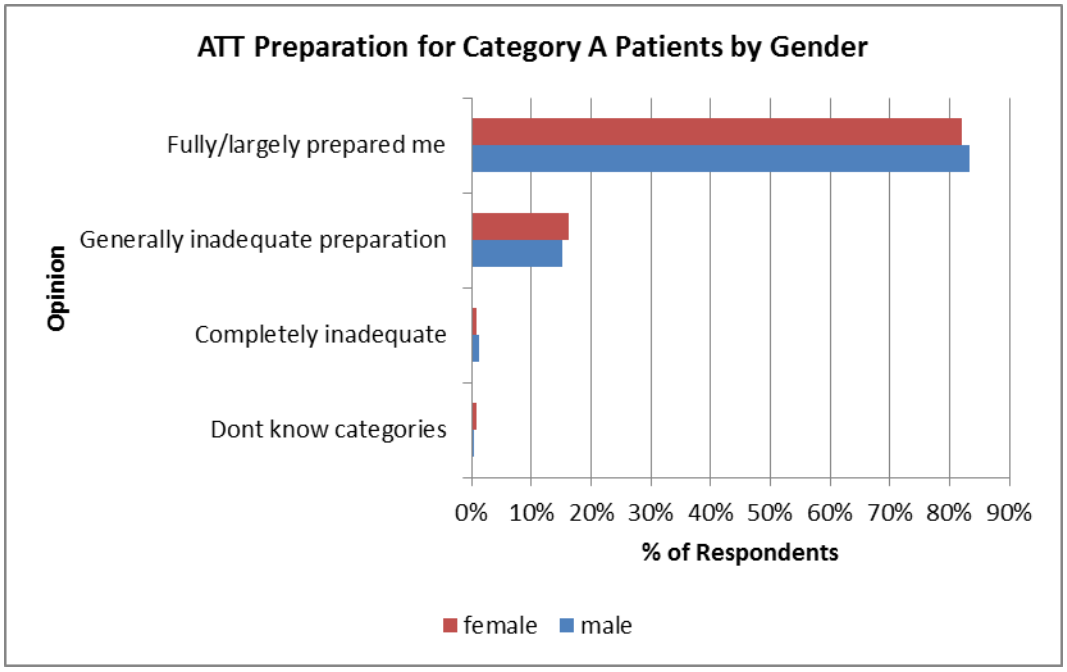

Figure 15: Preparedness for Category 'A' patients by Gender.

As can be seen in Figure 15, there appears to be no difference between the perceptions of male and female ambulance technicians regarding their preparedness to manage Category A patients and realistically none would be expected if the training was equally valid for both males and females.

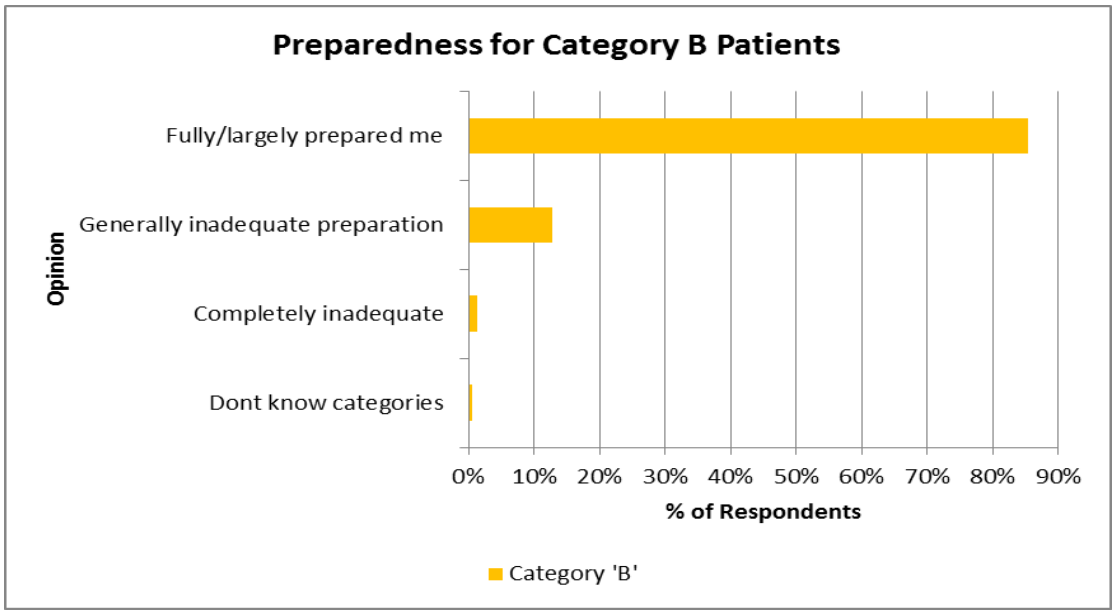

Figure 16: Preparedness for Category B patients

The majority of respondents appeared satisfied with their level of preparation to deal with Category B patients (see figure 16), however, this group is arguably less easy to define than the acutely ill Category A patients or the lower priority Category C patients. Category B has now been withdrawn as a separate group and is no longer considered within the national triage definitions.

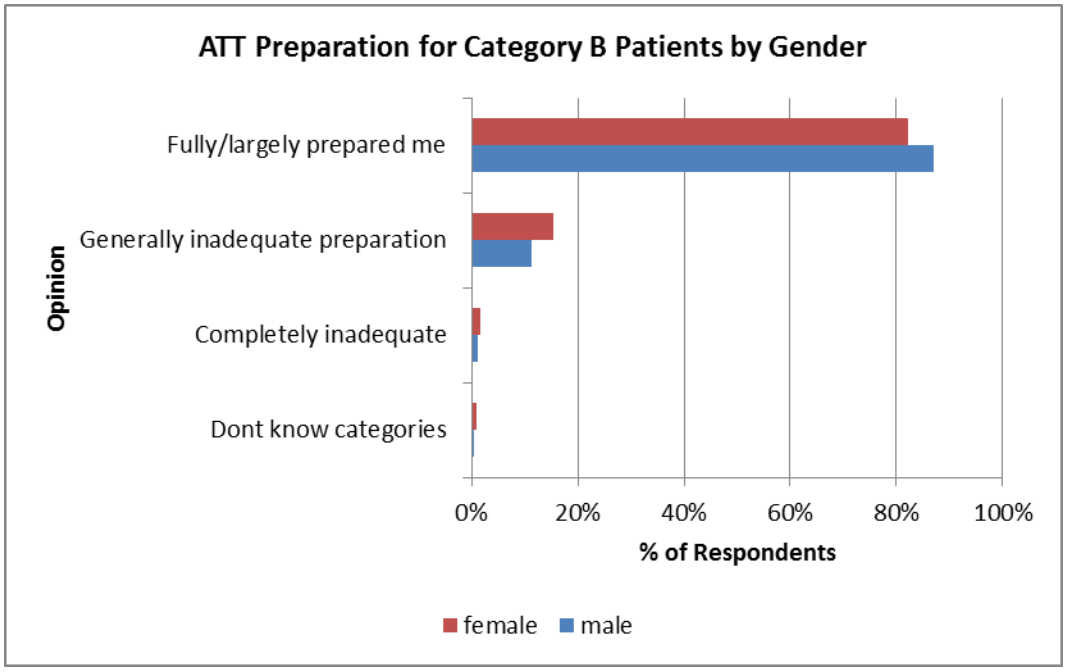

Figure 17: Preparedness for Category B patients by Gender

There were no significant differences reported by gender in respect of preparation to deal with category 'B' patients. Only a minority held the view that there were deficiencies (figure 17).

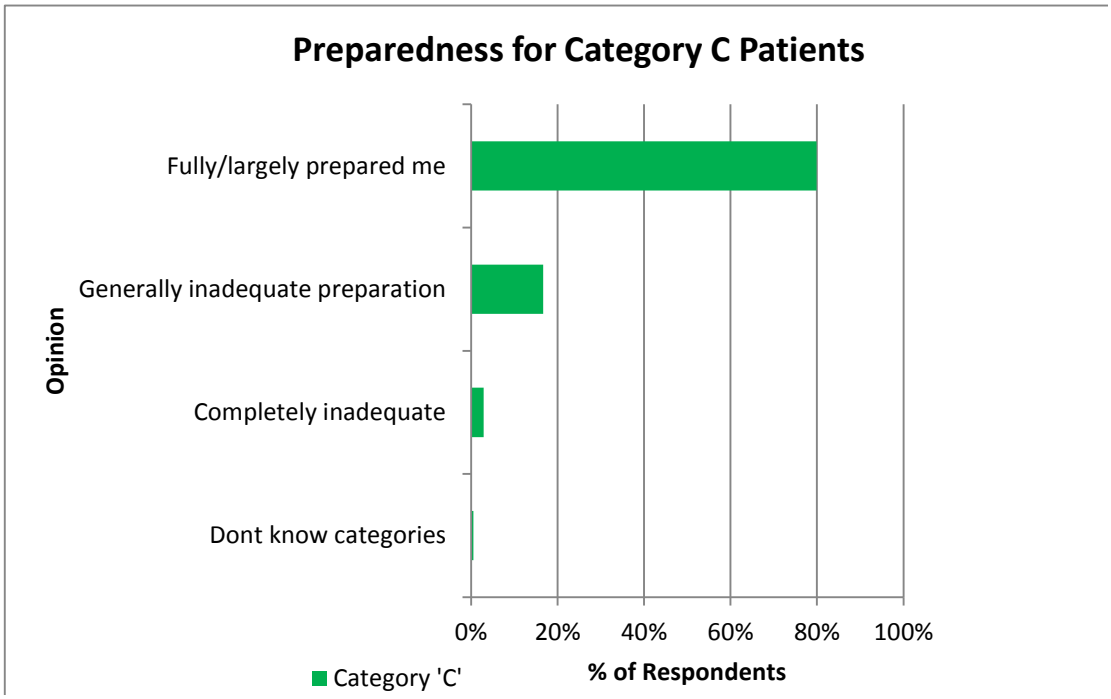

Figure 18: Preparedness for Category C patients

Category ‘C’ cases, while classified as ‘not serious and not life-threatening,’ do contain a well-documented proportion of patients with emergent conditions that can escalate to become more serious, even life-threatening. As discussed previously, the Ambulance Service was not originally conceived to be an ‘end point in care’ and if the expectation is that these patients will be transported for medical evaluation the patient and the clinical risk is transmitted ‘up the chain’ to A&E. However, if ambulance crews are encouraged to use alternative referral pathways or to terminate care in the field there is a clear mismatch in the training and education of ATTs to safely undertake this role. Unfortunately, these issues could not be fully addressed at the time of the study, due to the rapidly changing nature of the Ambulance Service and a failure to predict the extent of change in respect of conveying or not conveying patients.

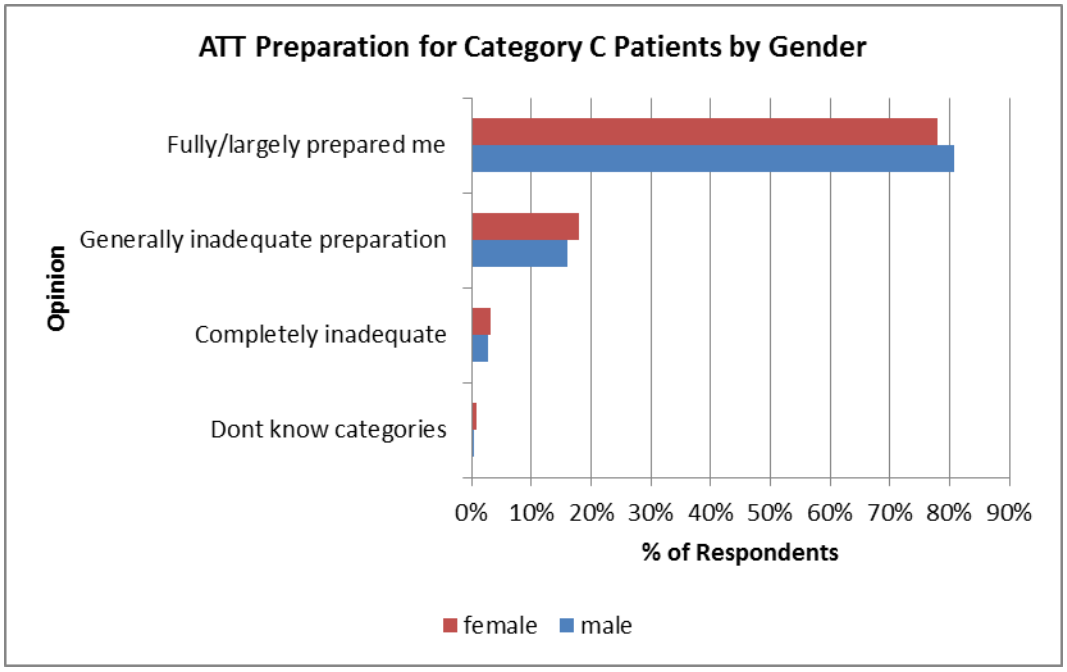

Figure 19: Preparedness for Category C patients by Gender

Figures 18 and 19 illustrate the population's opinions on how well the technician training course prepared them for Category 'C' patients. Overall respondents felt that the course had largely prepared them, as with 'A' and 'B' calls. When the information is then broken down by gender it is interesting to note that for Category 'A' calls both males and females agreed on the readiness the course had provided them with.

If the prevailing expectation was that all these patients would be removed to hospital, then the levels of confidence of the survey participants are not unreasonable. However, this is unlikely to have been the case, as during the study period, all Ambulance Services were reporting conveyance rates well below 100%. This implies that clinical decisions not to transport patients to hospital were being made. These may, in some cases, have been unsafe, as traditionally the Ambulance Service has not been designed to terminate episodes of care 'in the field,' given their

historical transport focus, although, one of the themes of this research is that this operational model is changing very rapidly now.

VII.1.6 Technician and Paramedic Curriculum

Technicians and paramedics were asked to consider areas of the technician curriculum that might benefit from greater emphasis and to rate their satisfaction with modules of the current curriculum. Details of the curriculum can be found at Appendix VI.

The following tables show the summed percentage of respondents selecting “Very satisfactory”, “Satisfactory” or “Mostly satisfactory” as an indication of general satisfaction. The percentage scores within each category for both technicians and paramedics are not shown, but are available in the Questionnaire Distribution at Appendix I Section C.

This section has divided the technicians’ training curriculum which, although modernised and revised over the last 4 decades, is still offered on a similar pattern recommended by the 1966 ‘Millar’ report, cited in the literature review, into 21 sub-sections. Each section represents a theme and immediately apparent is the differential satisfaction levels of technicians and paramedics, with paramedics consistently awarding lower satisfaction score for each of the categories.

Technicians had a higher general satisfaction with the curriculum than paramedics, for each individual module, although the responses showed a similar trend (Table 8).

The largest differences between technicians and paramedics were for the modules on ‘Understanding evidence based practice’ and ‘Information, research and study skills’.

Anatomy, physiology and management of critical medical emergencies (including cardiac resuscitation*)* were the two top ranked modules by both paramedics and technicians. Similarly, both technicians and paramedics, in terms of satisfaction with the current technician course, ranked management of psychiatric disorders lowest.

Of the 21 sections or modules that comprise the ambulance technician course, all have been analysed in terms of satisfaction in relation to gender and skill set. Seven sections are considered in detail within this results section. The remaining 14 have been included in the Appendices. The seven selected for particular attention in this section include *A&P, patient assessment, primary and social care needs, ethics and legal issues, medical emergencies, psychiatric disorders and paediatric emergencies.* The findings and trends of these modules are representative of all those modules and elements surveyed and, therefore, provide a clear and consistent picture as to the levels of satisfaction in respect of the results generally.

Table 8: Percentage of respondents generally satisfied with Technician curriculum/course modules

Item	Module	% Generally satisfied[1]	
		Technicians	Paramedics
A	Anatomy and Physiology	94	87
B	Clinical patient assessment including physical examination skills	86	70
C	Assessment of patients' primary and social care needs	68	49
D	Ethics, Law and Professional Practice issues	57	39
E	Management of critical medical emergencies including cardiac resuscitation	91	86
F	Management of critical trauma emergencies	83	78
G	Pharmacology, over-dosage of drugs, and poisoning	55	44
H	Management of psychiatric disorders	39	25
I	Management of obstetric emergencies	40	35
J	Management of Paediatric emergencies	41	36
K	Recognition of child abuse	52	36
L	Management of elderly patients	73	62
M	Management of major incidents	65	54
N	Management of hazardous materials	51	40
O	Management of aggression and violence	51	40
P	Use of technology	54	45
Q	Management Health and Safety	69	56
R	Manual handling, etc	87	75
S	Understanding Evidence Based Practice	59	38
T	Information, research and study skills	50	29
U	Teamwork skills	77	60

1. Percentage of respondents indicating “Very satisfactory”,” Satisfactory” or “Mostly satisfactory”.

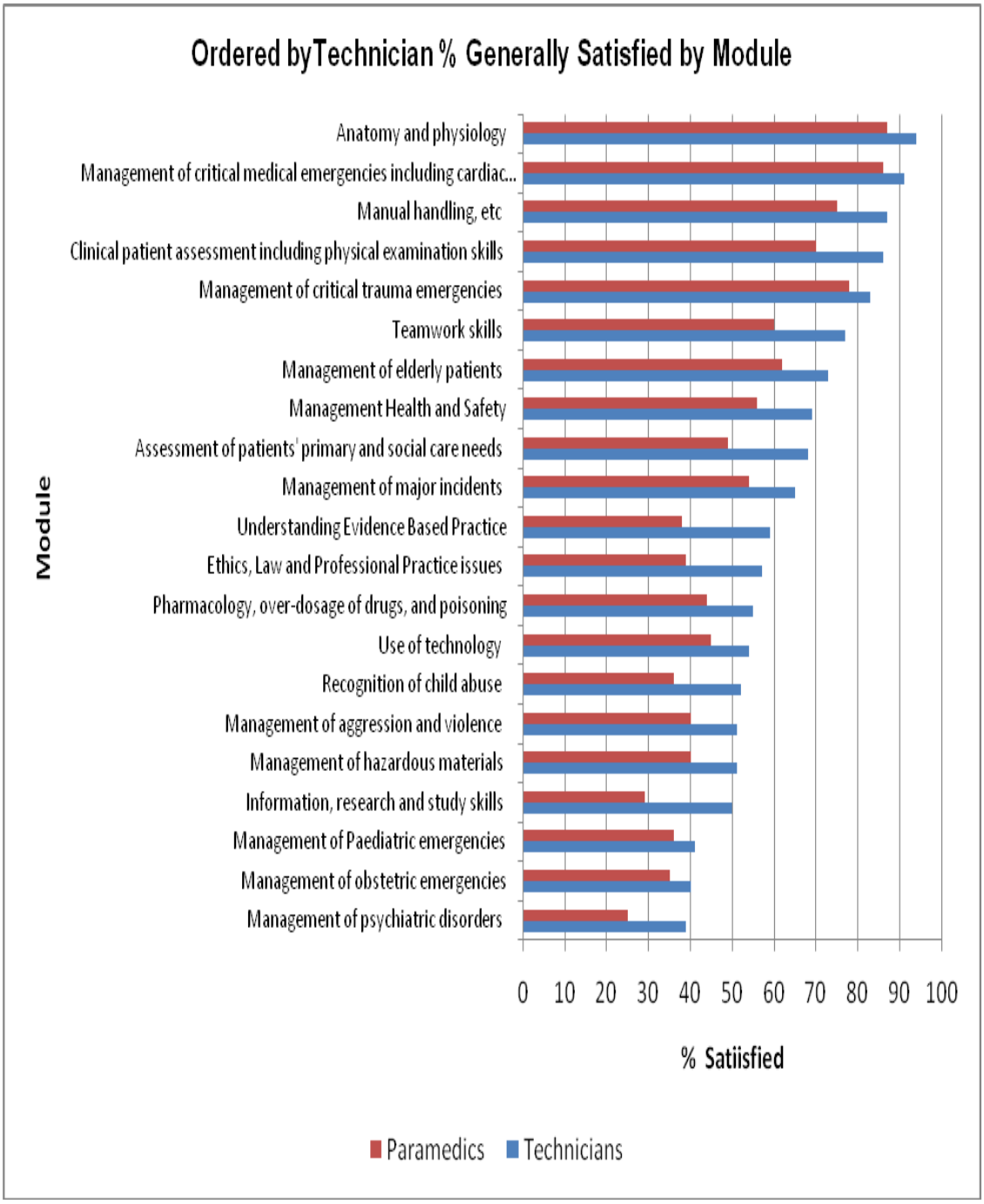

Figure 20: Ordered by technicians % generally satisfied by module.

Figure 20 outlines the modules within the ATT course that the technicians felt satisfied with them the most. The five modules that left the respondents with the highest levels of satisfaction were *A&P*, *Management of Critical Medical Emergencies (including cardiac arrest), Manual Handling, Clinical Patient*

Assessment including physical examination skills and Managment of Critical Trauma Emergencies. These modules embody key skills which both technicians and paramedics appear to view as core to their practice and which they appear to value highly.

Both technicians and paramedics showed similar levels of satisfaction (see figure 21). The most popular modules seem to be largely in accord between both groups with *A&P* and *management of medical emergencies* and *manual handling* being the same for both groups.

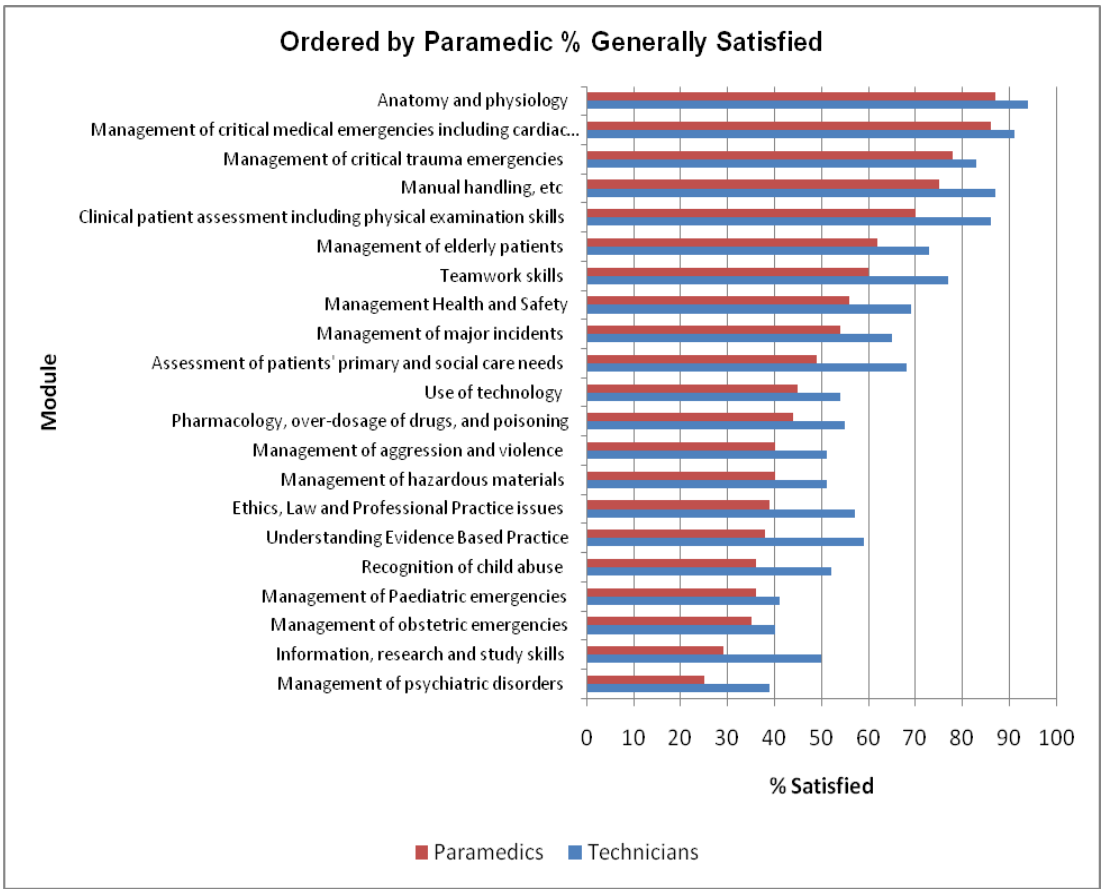

Figure 21: Percentage of respondents generally satisfied by curriculum modules on technician training course/curriculum, demonstrating a similar pattern for comparison.

Table 9: Satisfaction of the respondents to the Paramedic Curriculum

Satisfaction of the current Paramedic Curriculum				
Module	% generally satisfied[1]	rank	% generally dissatisfied [2]	rank
Anatomy and Physiology	85	1	6	20
Management of critical medical emergencies including cardiac resuscitation,	85	1	5	21
Management of critical trauma emergencies	82	3	8	19
Clinical patient assessment including physical examination skills	74	4	16	18
Manual handling	68	5	22	17
Teamwork skills	62	6	28	16
Management of Paediatric emergencies	58	7	32	15
Management of elderly patients	57	8	33	14
Pharmacology, over dosage of drugs, and poisoning	55	9	36	13
Assessment of patients' primary and social care needs	53	10	38	12
Management of obstetric emergencies	52	11	39	11
Management of major incidents	50	12	40	10
Management Health and Safety	49	13	41	9
Use of technology	47	14	43	8
Understanding Evidence Based Practice	43	15	48	7
Recognition of child abuse	41	16	49	6
Ethics, Law and Professional Practice issues	40	17	51	5
Management of hazardous materials	38	19	51	4
Management of aggression and violence	38	18	52	3
Information, research and study skills	35	20	56	2
Management of psychiatric disorders	27	21	63	1

1. Percentage of respondents indicating “Very satisfactory”, “Satisfactory” or “Mostly satisfactory”.
2. Percentage of respondents indicating “Very unsatisfactory” “Unsatisfactory” or “Mostly unsatisfactory”.

Table 9 lists the paramedic modules in order of the course participants’ general satisfaction with the modules delivering the most satisfactory at the top.

Table 9 shows that the top four modules are all focussed on the more traditional areas of pre-hospital practice with a more acute theme. This perhaps reinforces the view that respondents perceive their role and thereby value materials with a 'classic' emergency component and, indeed, paramedics have been accused of being 'trauma junkies' (Palmer 1983). There was a high level agreement between technicians and paramedics regarding the relative value of modules. When the same list is considered in terms of the least satisfying modules the module that deals with the *Management of Psychiatric Disorders* proves to be the least satisfactory.

This is a potentially important finding and there could be many explanations for why paramedics felt that their preparation in this area was poor. In the triage data extracted from the AMPDS system 3% of cases were classified as psychiatric or behavioural emergencies and a further 3% were listed as overdoses of drugs which could be expected to have some degree of psychiatric component. This provides some evidence that there is a reasonable caseload of patients with mental health problems. Certainly the technician and paramedic programmes that predominated when this survey took place had a very limited psychiatric content. Satisfaction level may, therefore, relate more to the quality of the learning experiences. Therefore it seems logical to suggest that the low priority awarded to this important area of clinical practice was the root cause of dissatisfaction.

VII.1.7 Technician and Paramedic results

This section delves further into how well the individual ATT course modules were received by the students. For each of the modules the information is looked at first by gender; this will show whether any of the modules are biased towards males or females. The second aspect to be examined is the view that the current paramedics have in comparison with the technicians. The final aspect examined is whether working with a paramedic allows a greater appreciation of the modules taught on the ATT course. This information is examined overall and then by gender. Given that each of the modules is addressed in turn there is a danger of repetitiveness, hence example modules, are considered with much of the results associated with this section forming Appendix VII. A further Appendix (VI) contains reference information regarding the structure of the technician course including how the individual models were grouped within the technician programme.

VII.1.8 Anatomy & Physiology ATT Training Module

Note that Ambulance Technician Training is contained within 3 overarching modules, ‘D’, ‘E’ & ‘F’ (See Appendix VI). Basic A&P is contained in module ‘D’.

Table 10 shows the numeric values by clinical grade and the relative levels of satisfaction. The data is used to generate figure 25.

Table 10: Anatomy & Physiology ATT Training Module

		Technician or paramedic		
		Technician	**Paramedic**	**Total**
Tech curriculum in A&P	Very satisfactory	109	50	159
	Satisfactory	193	179	372
	Mostly satisfactory	66	100	166
	Mostly unsatisfactory	11	13	24
	Unsatisfactory	3	5	8
	Very unsatisfactory	1	3	4
Total		383	350	733

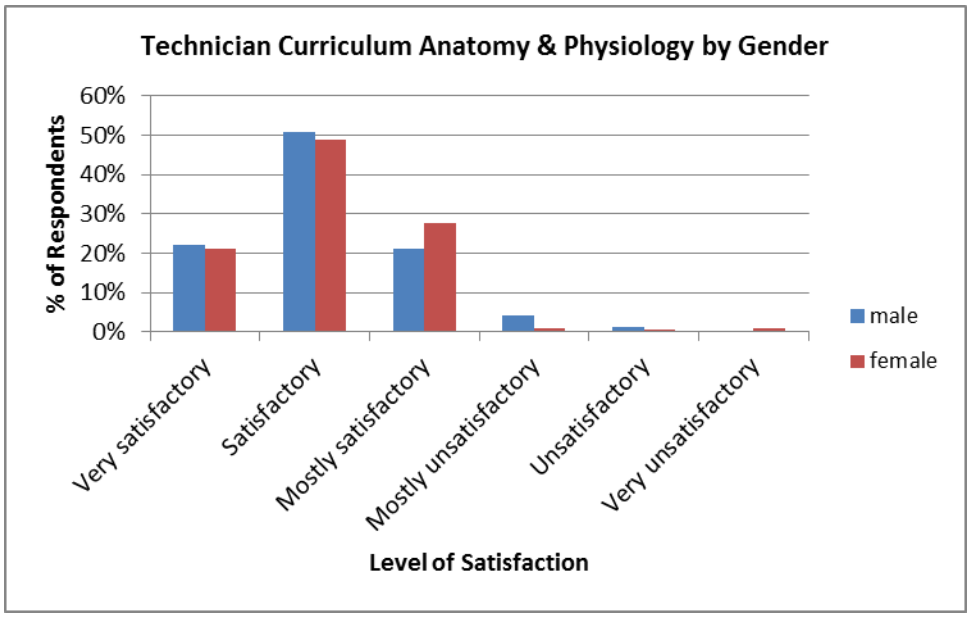

Figure 22: Satisfaction of Anatomy & Physiology ATT Training Module by Gender demonstrating that there was no difference between males and females.

Clearly the relevance of this module and the experience of staff undertaking it was regarded as rewarding. It is noteworthy that the replacement for the ATT programme (the ECSW) has removed A&P from the curriculum. It would be worth investigating if this revision has influenced rates of satisfaction.

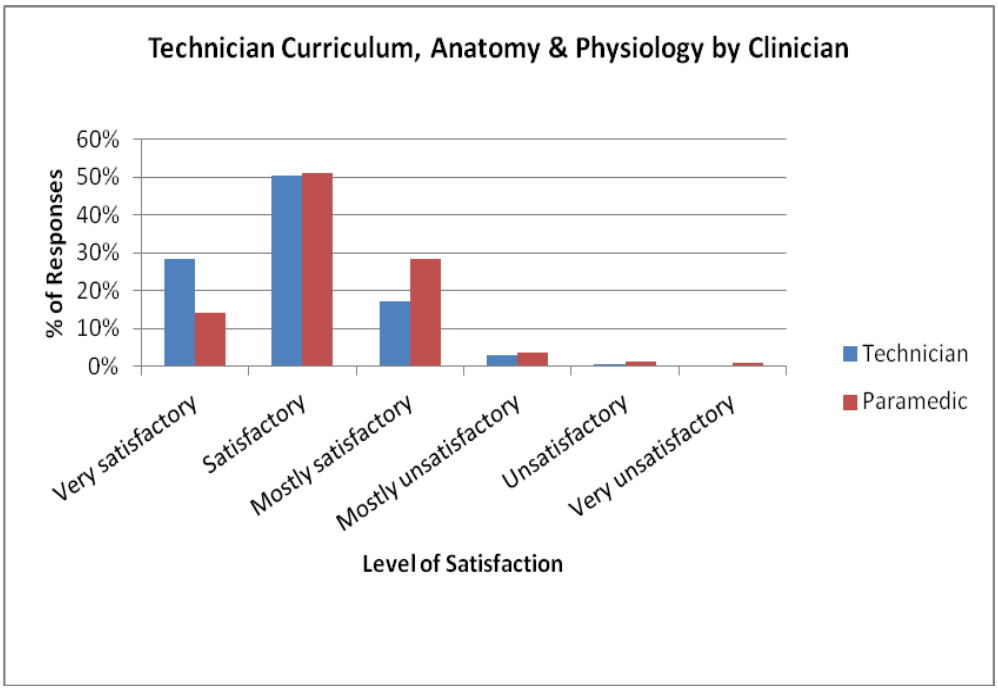

Figure 23: Satisfaction of Anatomy & Physiology ATT Training Module presented by Ambulance Technician and Paramedic.

Figure 23 shows that similar levels of satisfaction were reported by both clinical grades.

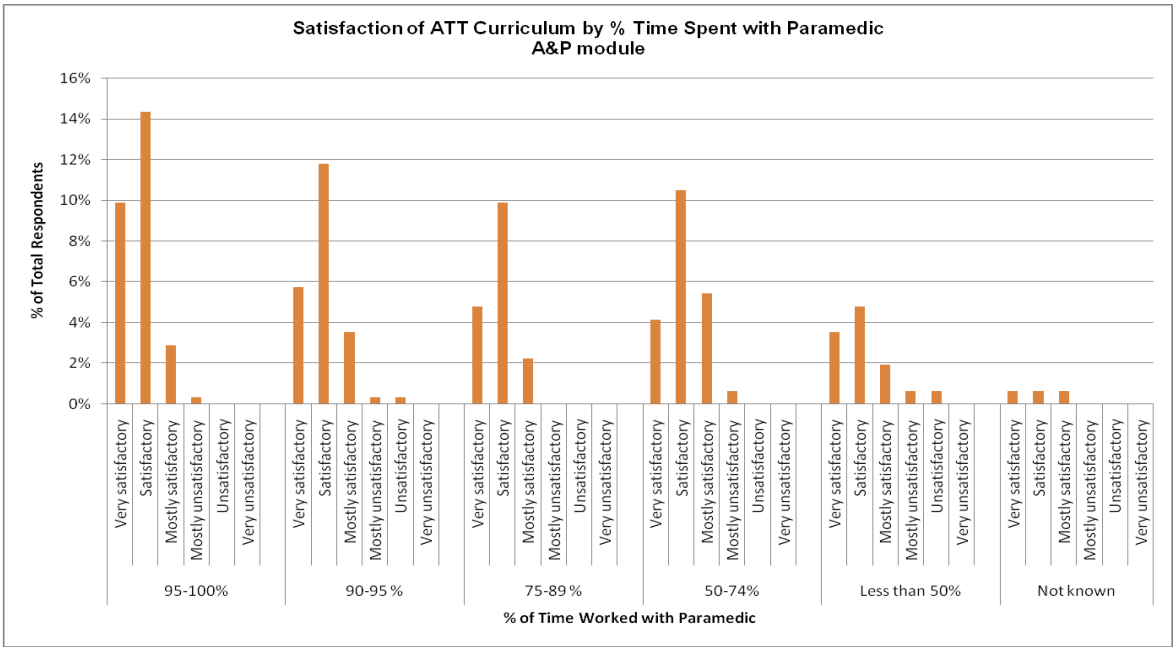

Figure 24: Satisfaction of Anatomy & Physiology ATT Training Module by Time spent with Paramedic (male and female technicians).

As can be seen in figure 24, satisfaction of respondents, both males and females, with regard to their training in A&P tends to be higher where technicians spend between 95% and 100% of their time with paramedics.

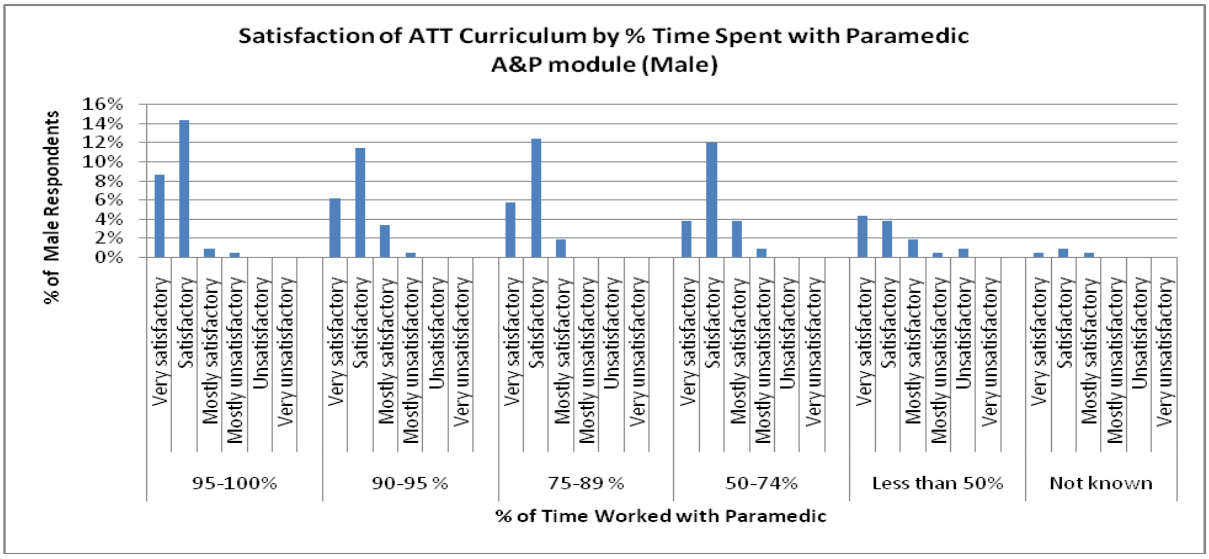

Figure 25: Satisfaction of Anatomy & Physiology ATT Training Module by Time spent with Paramedic (male technicians).

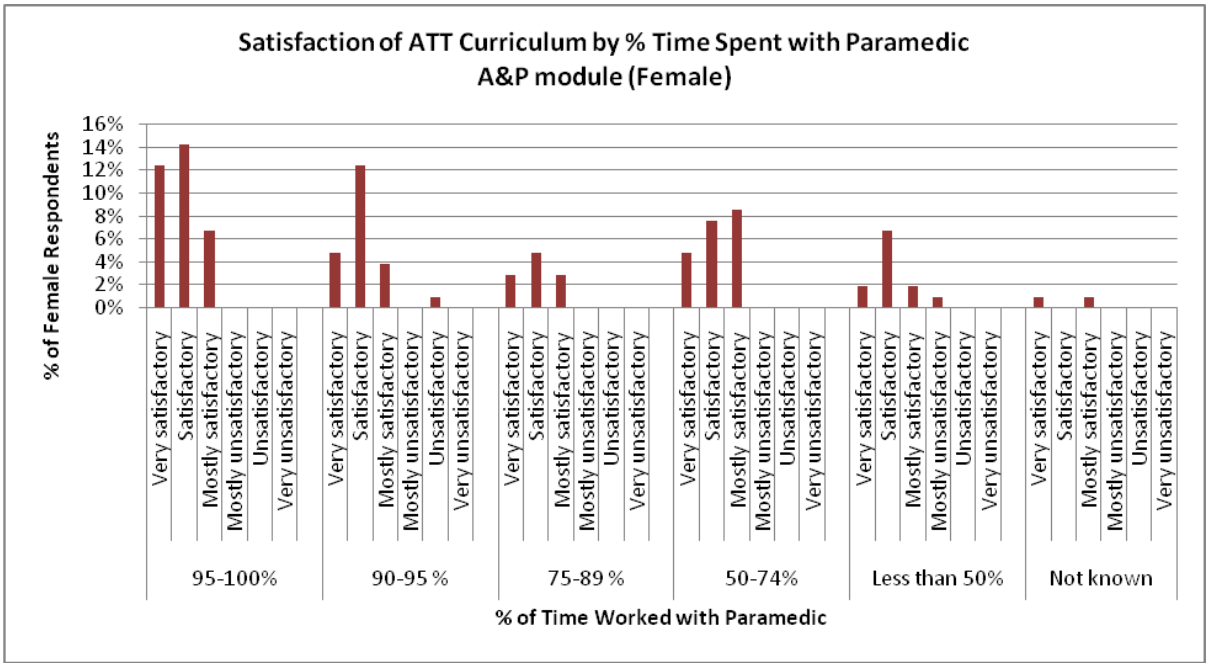

Figure 26: Satisfaction of Anatomy & Physiology ATT Training Module by Time spent with Paramedic (female technicians)

Figures 25 and 26 illustrate that in both genders a clear majority considered the module to be satisfactory, the figures also show that the module is not significantly biased towards either gender.

As indicated, technicians spending between 95% and 100% of their working time with a paramedic tended to appreciate the value of the A&P module more than those who spent less time with a paramedic and figures 25 and 26 show this to be the case whether the technician is male or female.

VII.1.9 Clinical Patient Assessment ATT Training Module

Table 11 and figures 27 to 31 show the same analysis for the clinical patient assessment module.

Table 11: Technician curriculum & clinical assessment

		Technician or paramedic		Total
		Technician	Paramedic	Technician
Tech curriculum & clinical patient assessment	Very satisfactory	63	25	88
	Satisfactory	148	121	269
	Mostly satisfactory	120	123	243
	Mostly unsatisfactory	38	41	79
	Unsatisfactory	11	27	38
	Very unsatisfactory	4	13	17
Total		384	350	734

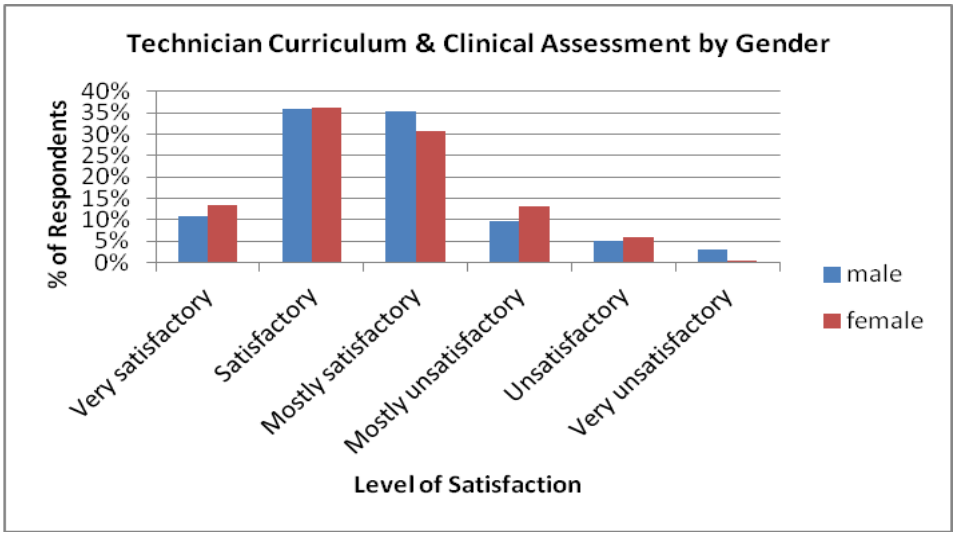

Figure 27: Technician curriculum & clinical assessment by gender, demonstrating few differences.

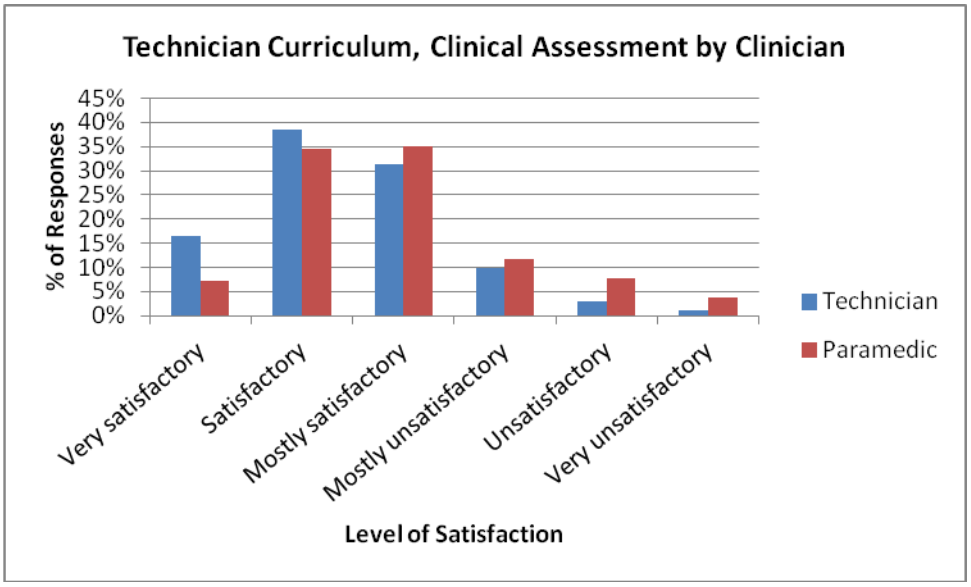

Figure 28: Technician curriculum & clinical assessment as evaluated by Technicians and Paramedics.

As with A&P, the findings of respondents both in clinical grade and in gender terms follow a similar pattern. There is a slightly lower satisfaction rate of paramedics at the very satisfactory level but otherwise the data is unremarkable.

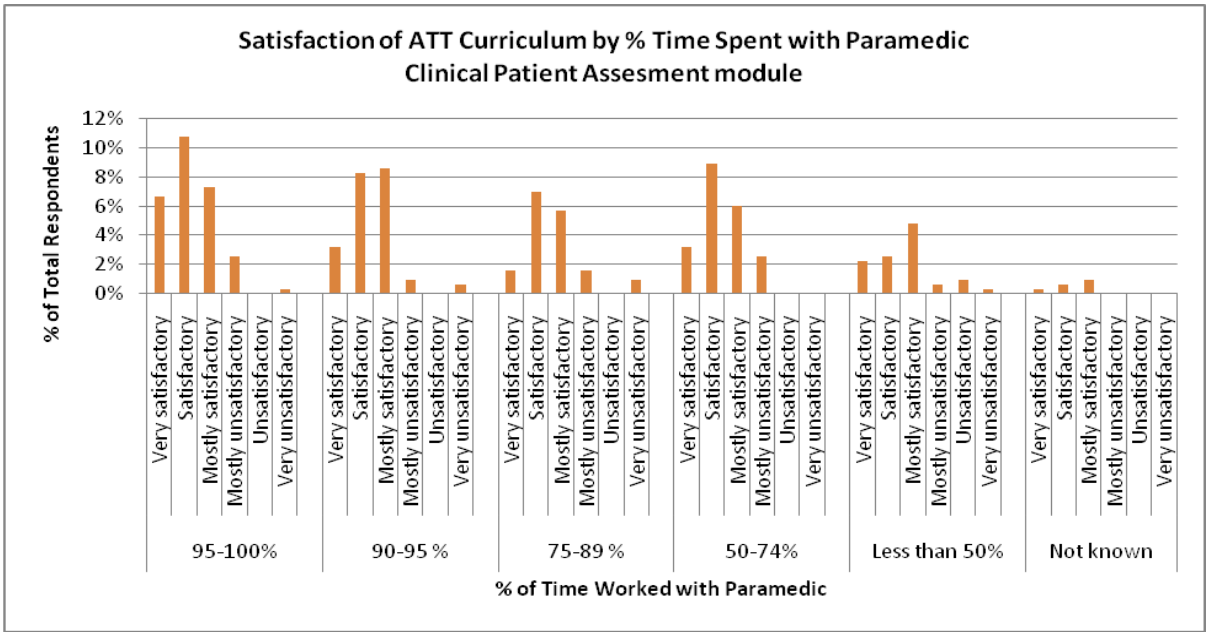

Figure 29: Technician curriculum clinical assessment by time spent with paramedic.

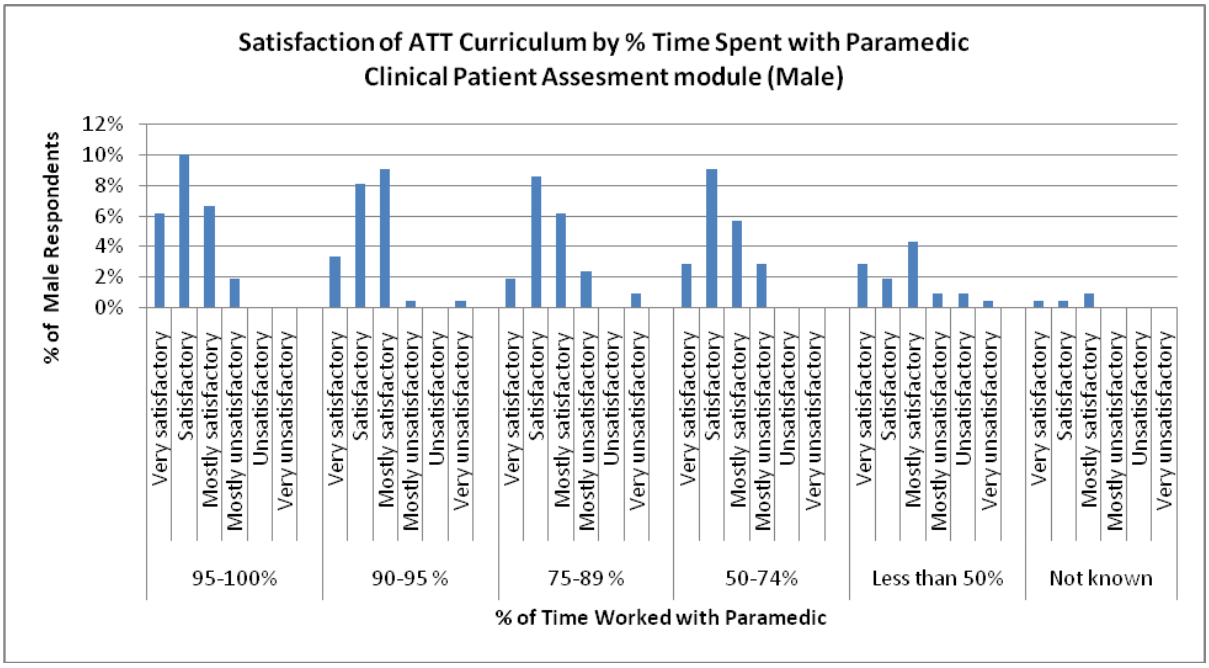

Figure 30: Technician curriculum clinical assessment by time spent with paramedic (male technicians).

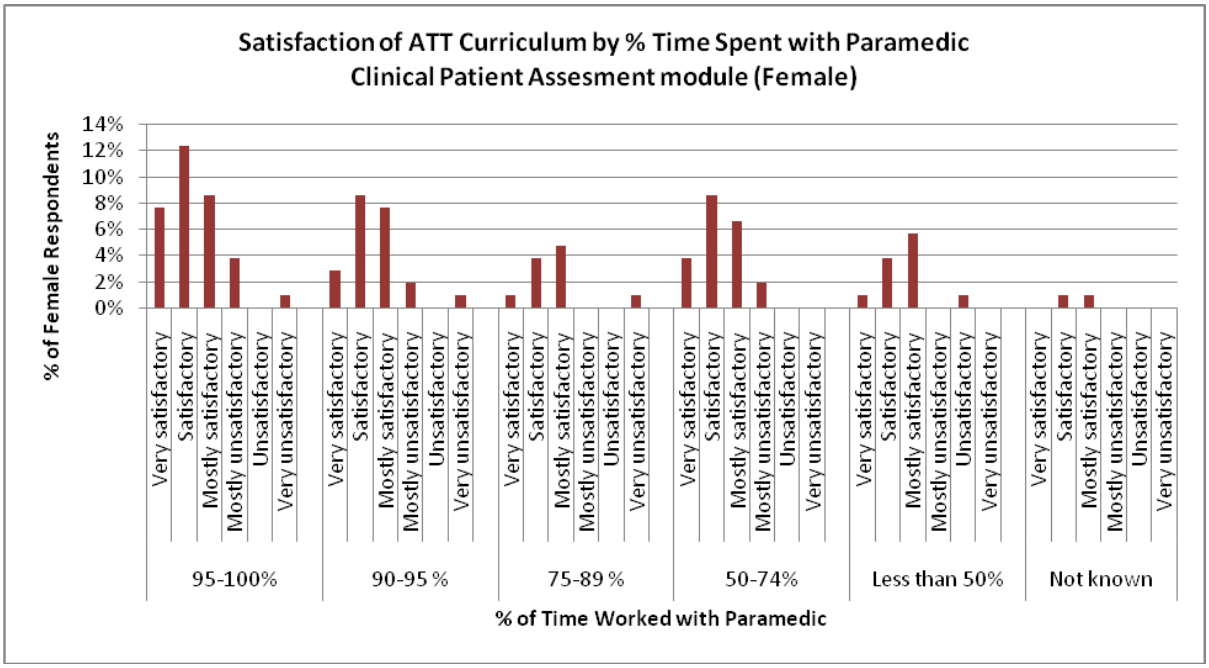

Figure 31: Technician curriculum clinical assessment by time spent with paramedic (female technicians).

Again the pattern of increasing time spent crewed with a paramedic tends to improve satisfaction levels with this aspect of the curriculum. There is the same trend for

males and females. The emerging theme is that technicians show greater levels of satisfaction broadly progressively as they spend more time working with a paramedic.

VII.1.10 Clinical Patient Assessment Primary & Social Care Needs ATT Training Module

Table 12 and the figures 32-36 show the analysis for the module in *primary and social care needs*

Table 12: Technician curriculum & assessment primary & social care needs

		Technician or paramedic		Total
		Technician	Paramedic	Technician
Tech curriculum & assessment primary & social care needs	Very satisfactory	28	10	38
	Satisfactory	91	66	157
	Mostly satisfactory	140	111	251
	Mostly unsatisfactory	69	85	154
	Unsatisfactory	36	53	89
	Very unsatisfactory	19	24	43
Total		383	349	732

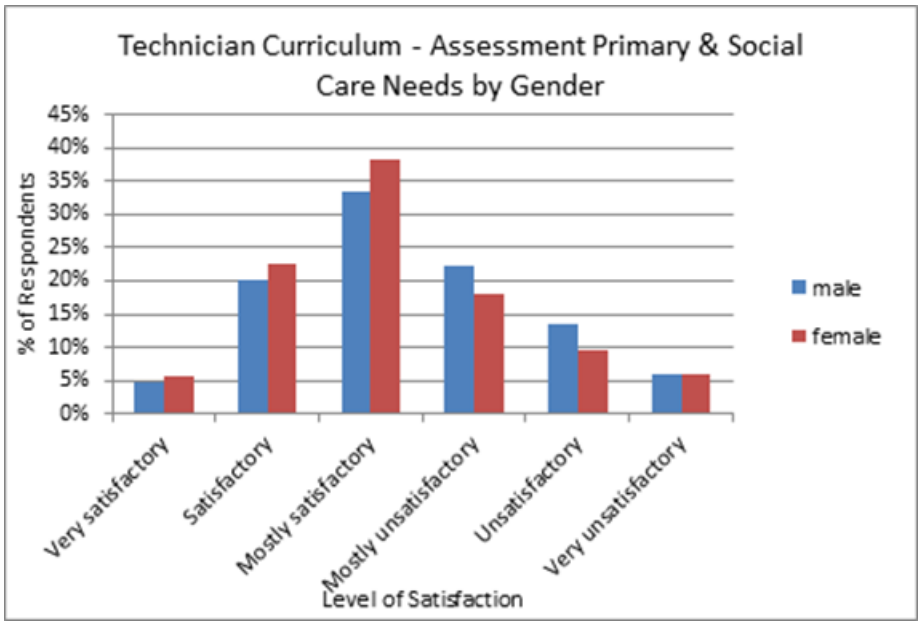

Figure 32: Technician curriculum & assessment primary & social care needs by gender.

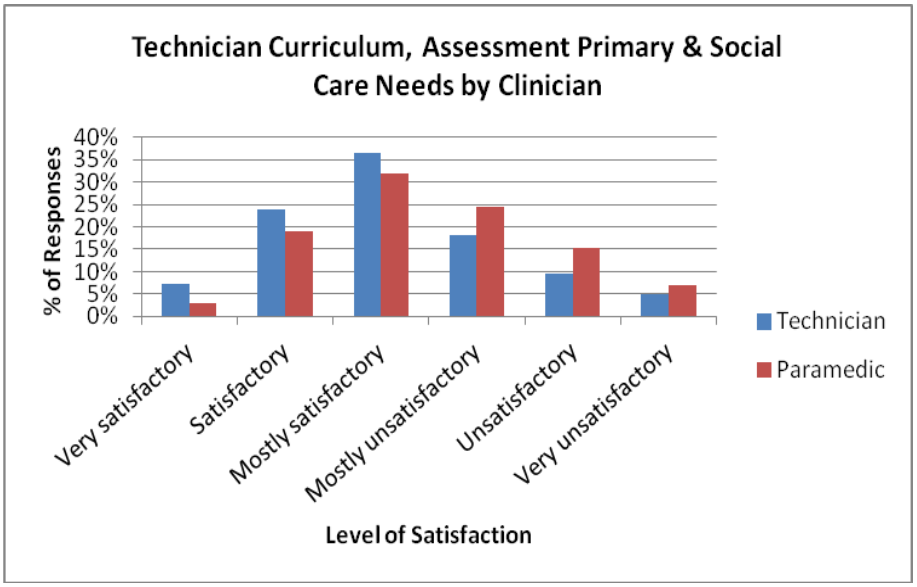

Figure 33: Technician curriculum & assessment primary & social care needs

Figure 33 illustrates that the *Assessment of Primary & Social Care Needs* module is not as well received as the previous two modules. This is evidenced by the fact that there exists a greater number of mostly satisfactory and unsatisfactory scores.

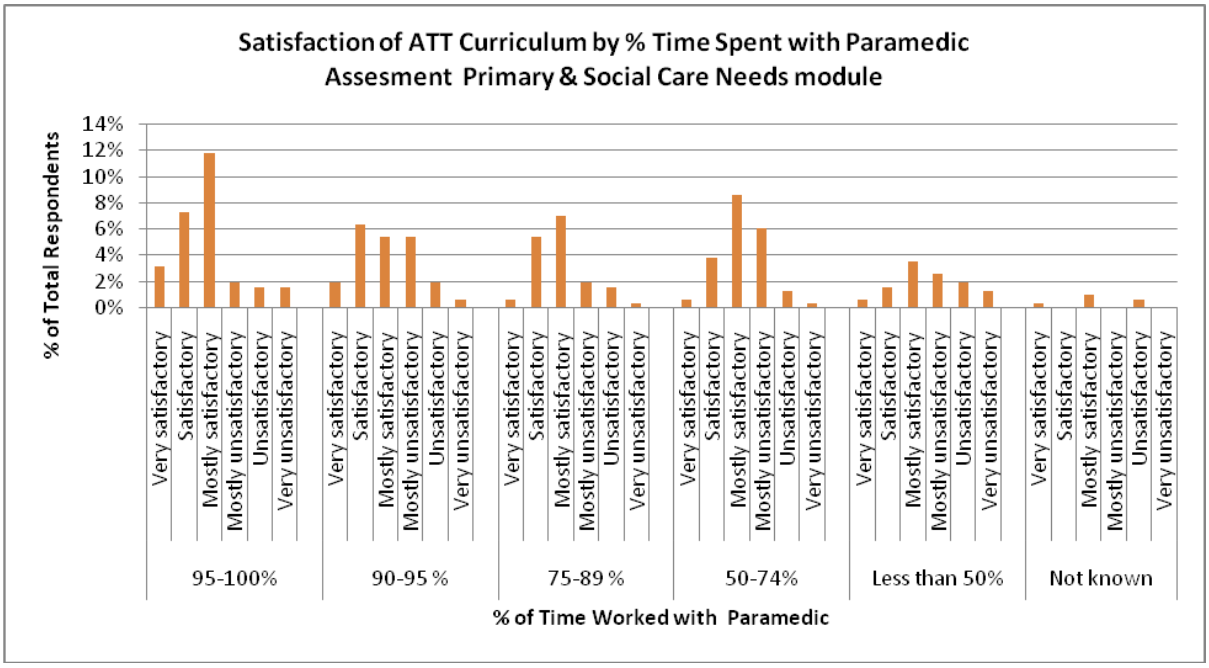

Figure 34: Technician curriculum primary & social needs by time spent with paramedic

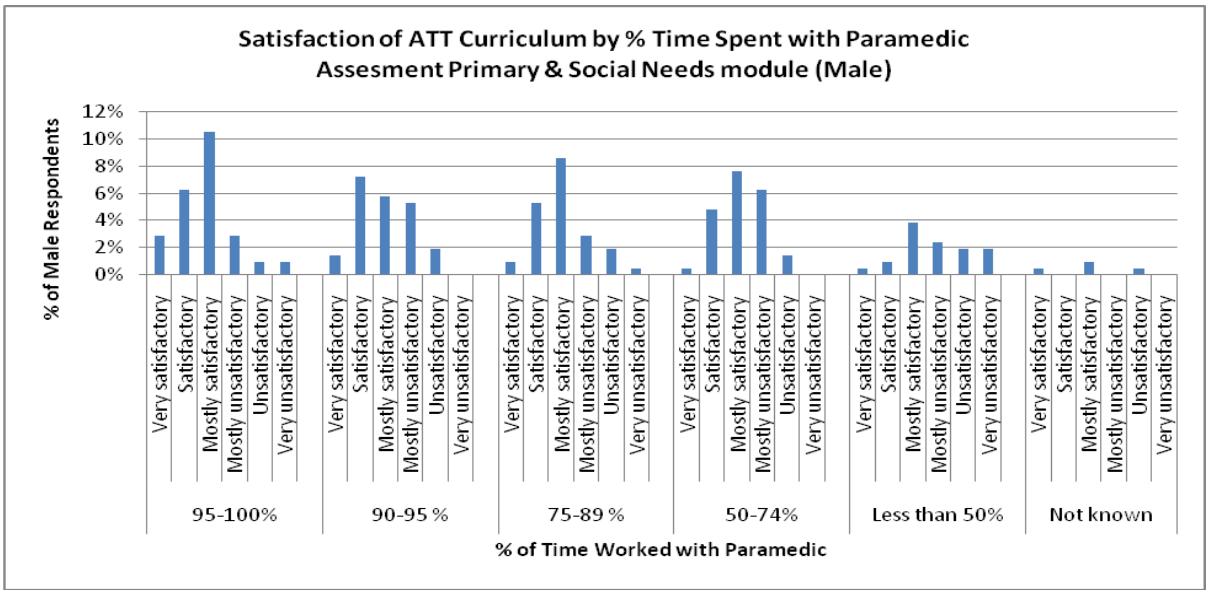

Figure 35: Technician curriculum primary & social needs by time spent with paramedic (male technicians).

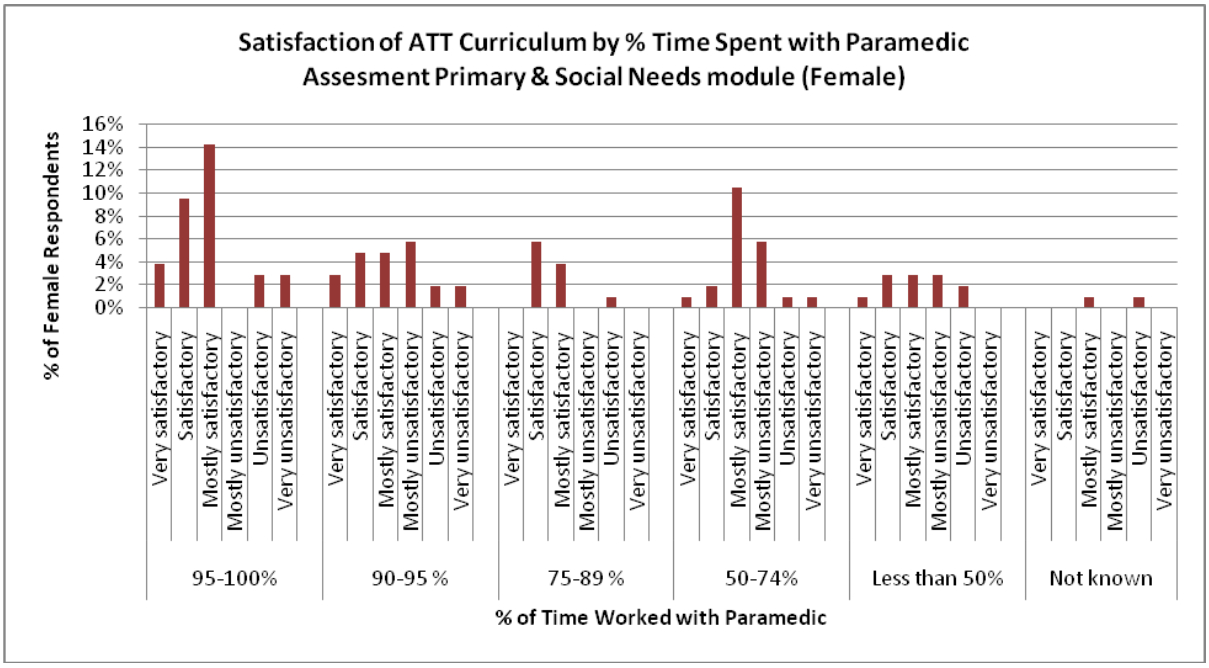

Figure 36: Technician curriculum primary & social needs by time spent with paramedic (female technicians).

From Figures 34, 35 and 36, it appears that whether or not participants work with a paramedic has less of an impact on participants' satisfaction with the module than in previous modules. The increasing predominance of patients with both health and social care needs is likely to require this aspect of paramedic practice to be explored and developed in greater depth in future.

VII.1.11 Clinical Patient Ethics, Law & Professional ATT Training Module

Ethics and law, whilst clearly very important topics, are certainly under-represented in terms of content within the traditional Institute of Health and Care Development (IHCD) paramedic curriculum. Academic programmes have clearly corrected this with more detailed input yet most respondents are likely to have undertaken the older programmes, some of which may have included "module J" ('Profession

issues'), an addition to the IHCD Paramedic course, which addressed this issue to some degree.

Table 13: Technician curriculum & ethics, law & professional

		Technician or paramedic		Total
		Technician	Paramedic	Technician
Tech curriculum & ethics, law & professional	Very satisfactory	18	13	31
	Satisfactory	78	36	114
	Mostly satisfactory	124	104	228
	Mostly unsatisfactory	85	94	179
	Unsatisfactory	50	67	117
	Very unsatisfactory	28	35	63
Total		383	349	732

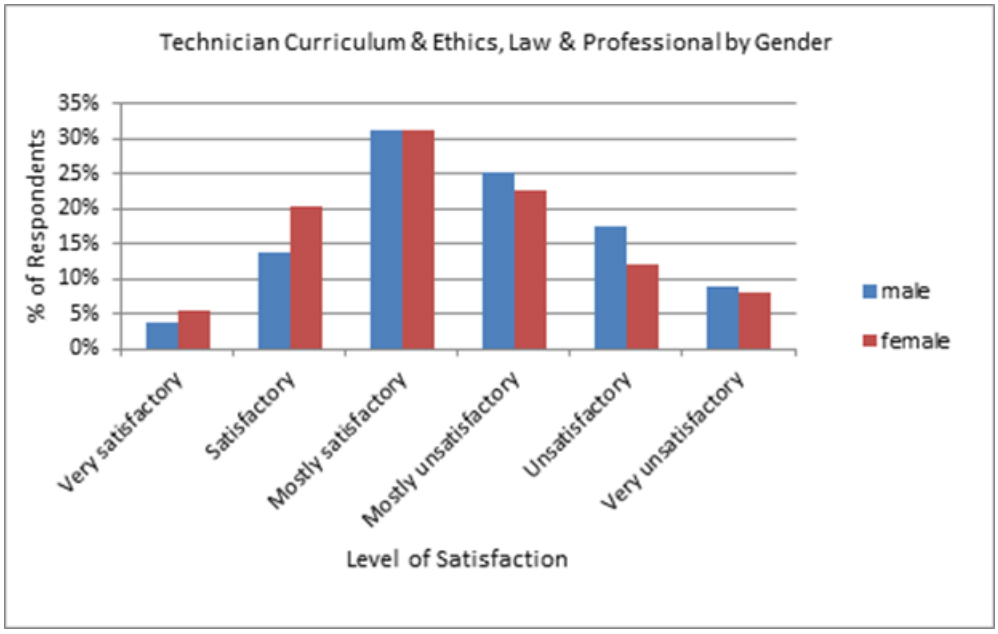

Figure 37: Technician curriculum & ethics, law & professional by gender.

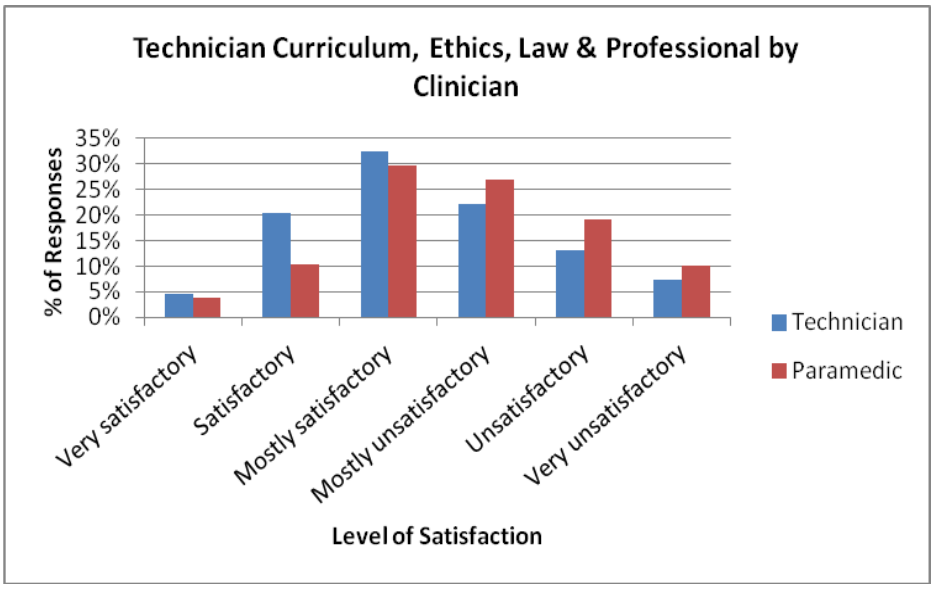

Figure 38: Technician curriculum & ethics, law & professional, Technicians and Paramedics.

On the whole the legal context of practice has progressively become even more relevant with statutory changes to legislation, such as the Mental Capacity Act and a greater public propensity to resort to law when shortcomings in care are identified. This module found to be “mostly satisfactory” by both genders and both skill sets. There are, therefore, fewer differences than have been exhibited in previous figures.

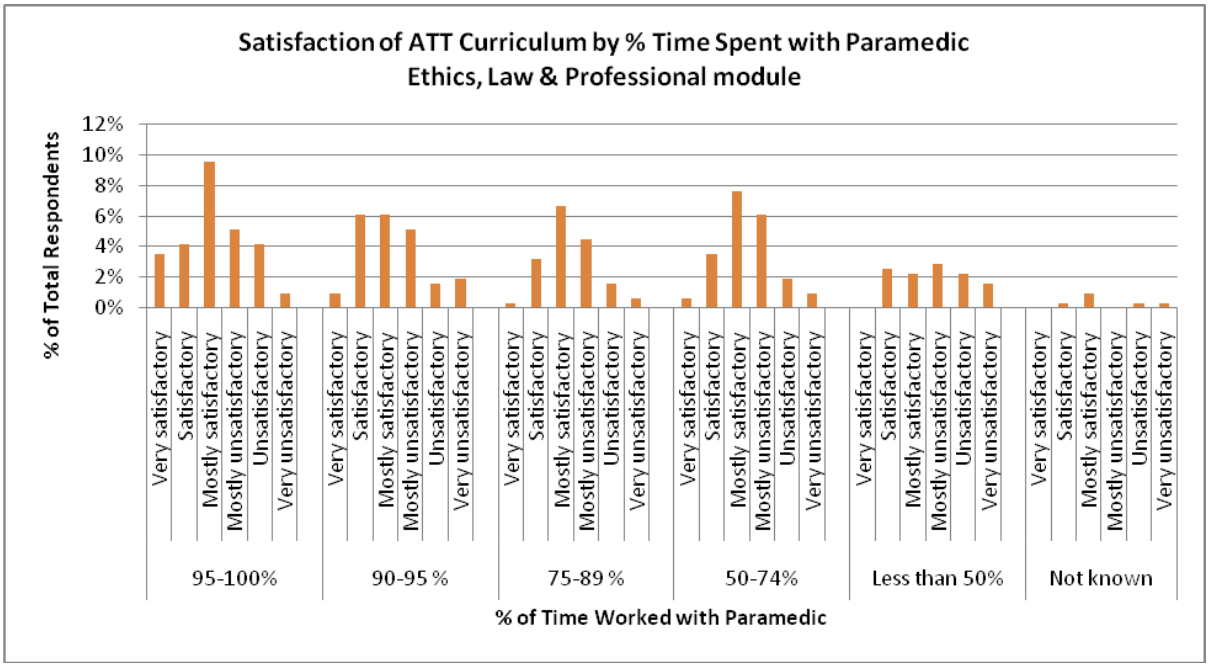

Figure 39: Technician curriculum ethic, law & professional by time spent with paramedic

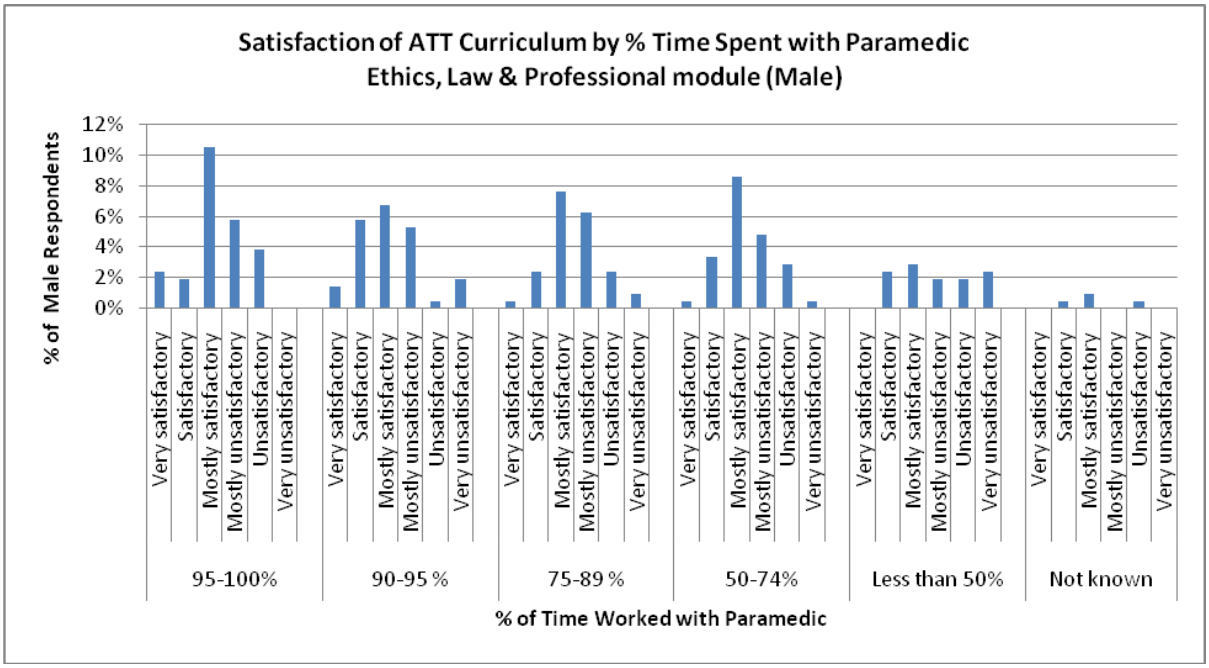

Figure 40: Technician curriculum ethic, law & professional by time spent with paramedic (male technicians).

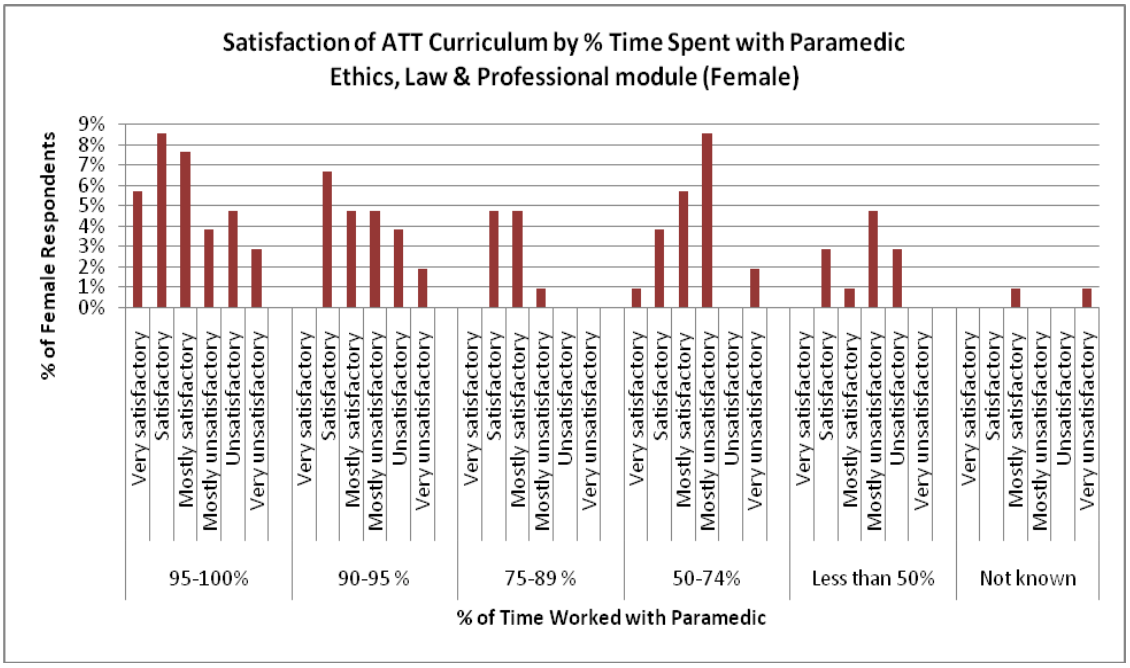

Figure 41: Technician curriculum ethic, law & professional by time spent with paramedic (female technicians).

Again, figure 41 shows that there is a very slight trend towards improving satisfaction as technicians spend more time with paramedics particularly in the female group at a 95% level.

VII.1.12 Management Critical Medical Emergencies ATT Training Module

Table 14 and figures 42 to 46 provide an analysis of responses related to the module 'Management of Critical Medical Emergencies'. This area has previously been regarded as very much the 'bread and butter' of ambulance life and has been a core aspect of both ATT and paramedic education. The data shows that satisfaction levels are quite high and that they are affected by working with a paramedic, but the association is, perhaps, not as strong as might be expected.

Table 14: Management Critical Medical Emergencies

		Technician or paramedic		Total
		Technician	Paramedic	Technician
Tech curriculum &management critical medical emergencies	Very satisfactory	118	88	206
	Satisfactory	159	156	315
	Mostly satisfactory	78	84	162
	Mostly unsatisfactory	22	17	39
	Unsatisfactory	5	5	10
	Very unsatisfactory	1	0	1
Total		383	350	733

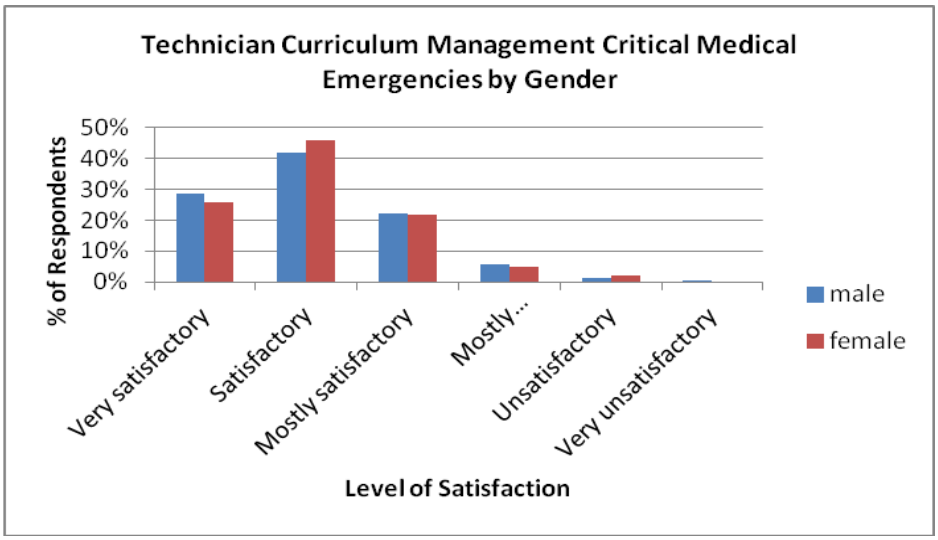

Figure 42: Management Critical Medical Emergencies by gender.

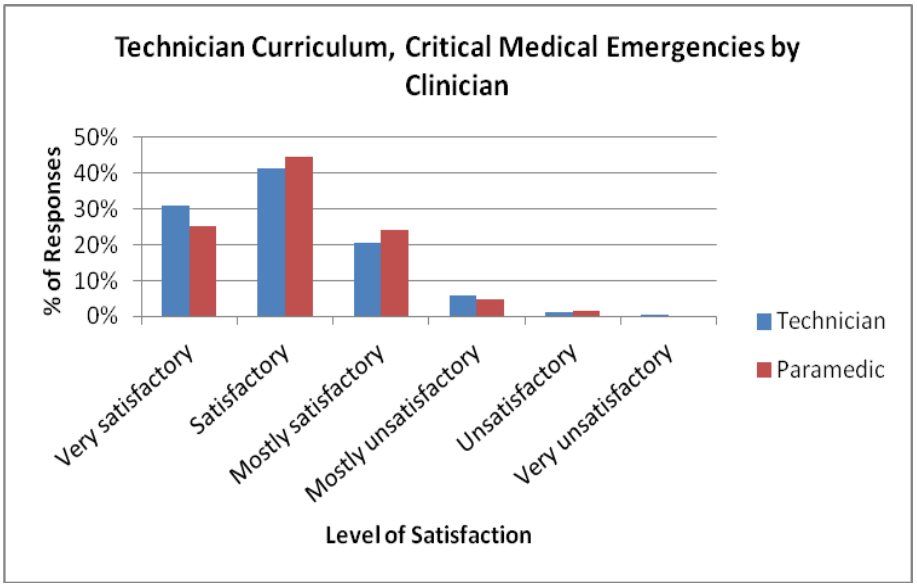

Figure 43: Management Critical Medical Emergencies by Technicians and Paramedics.

Much of the content of the traditional technician was focused on this area and satisfaction appears correspondingly higher than in many other modules.

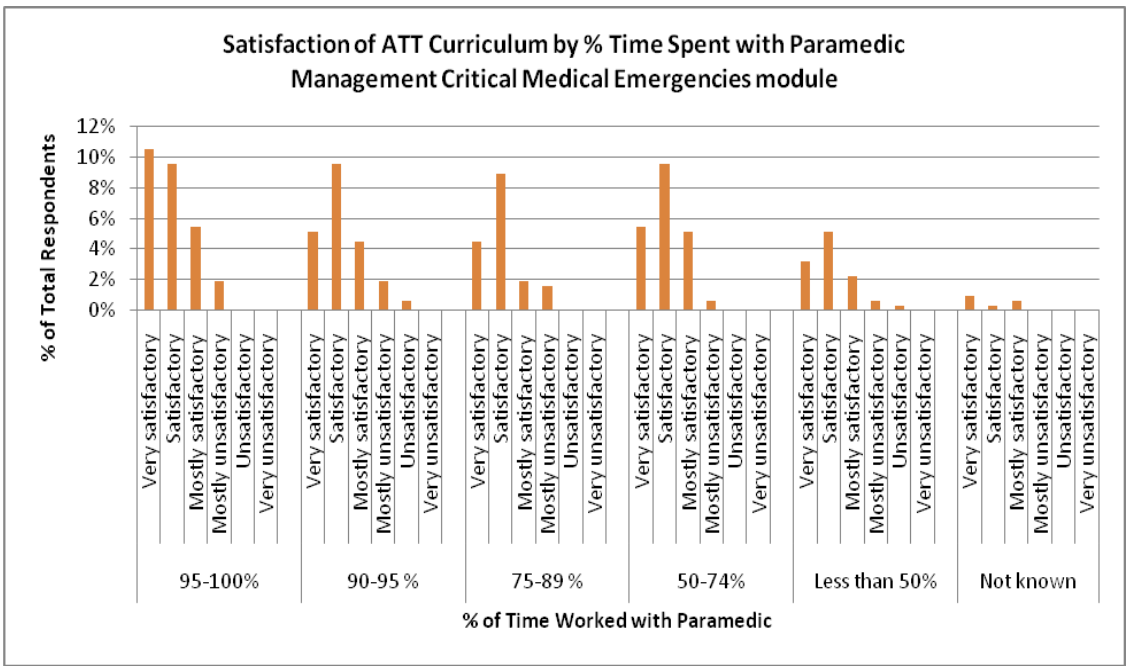

Figure 44: Technician curriculum management critical medical emergencies by time spent with paramedic.

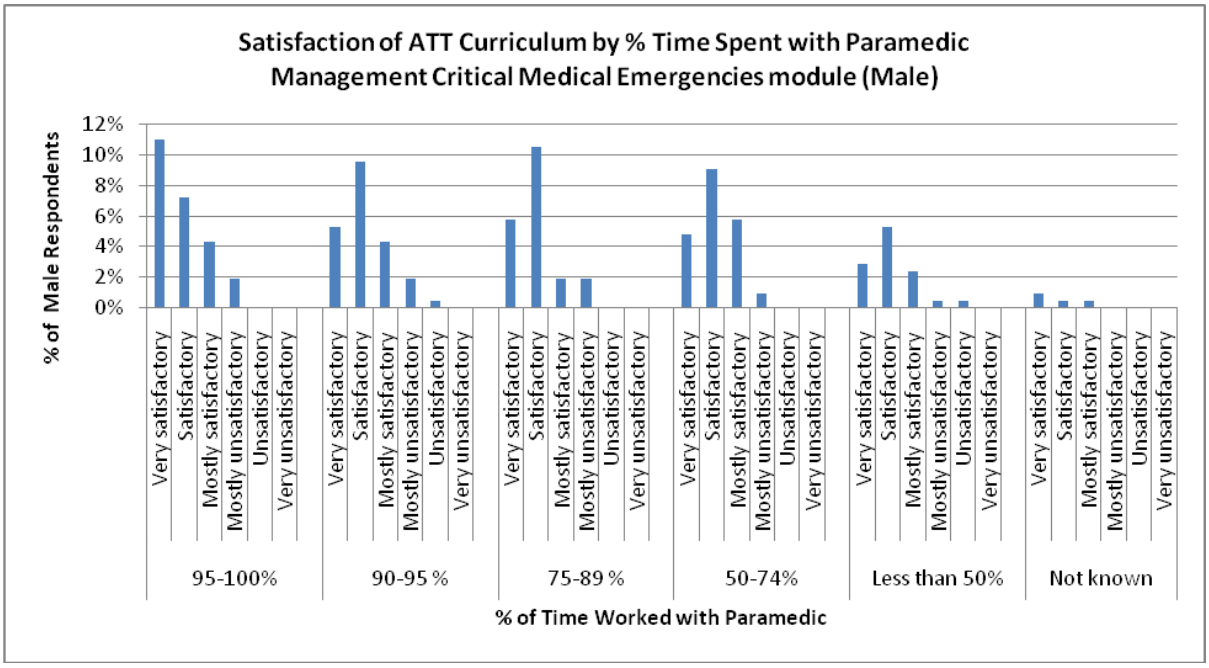

Figure 45: Technician curriculum management critical medical emergencies by time spent with paramedic (male technicians).

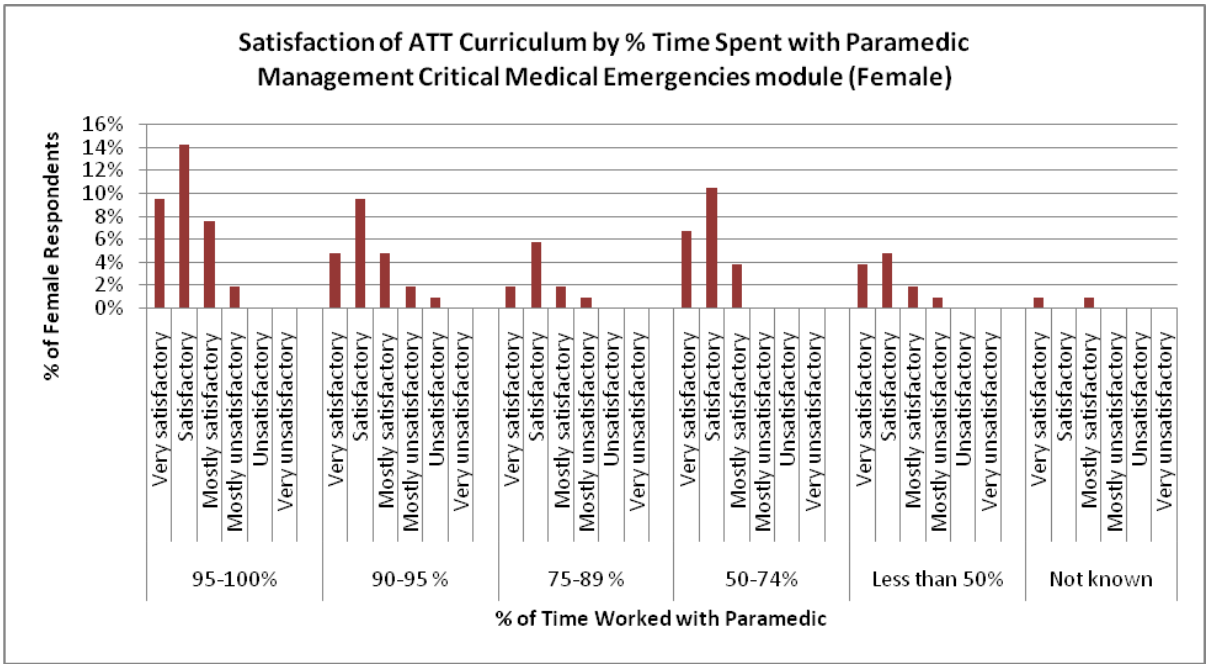

Figure 46: Technician curriculum management critical medical emergencies by time spent with paramedic (female technicians).

The results shown in figures 44, 45 and 46 follow a similar pattern with a progressively improving level of satisfaction as technicians spend more time working

with a paramedic. This is particularly true for male technicians spending 95-100% of their time with a paramedic.

VII.1.13 Psychiatric Disorders ATT Training Module

Table 15 and figures 47 to 51 provide an analysis of responses related to the module *Psychiatric Disorders.* This is an area that has previously been identified as an area of low satisfaction in terms of preparation. Relatively little time is afforded to this increasingly important area. It is likely to be an area worthy of revision to the curriculum and clearly deserves to have a high priority in the future.

Table 15: Technician curriculum & psychiatric disorders

		Technician or paramedic		Total
		Technician	Paramedic	Technician
Tech curriculum &psychiatric disorders	Very satisfactory	8	3	11
	Satisfactory	47	25	72
	Mostly satisfactory	96	69	165
	Mostly unsatisfactory	120	111	231
	Unsatisfactory	79	96	175
	Very unsatisfactory	32	45	77
Total		382	349	731

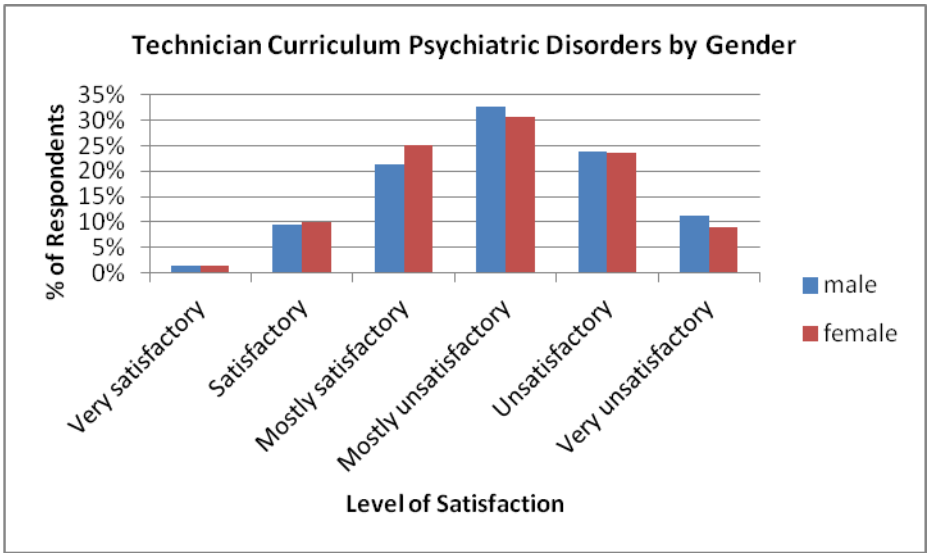

Figure 47: Technician curriculum & psychiatric disorders by gender

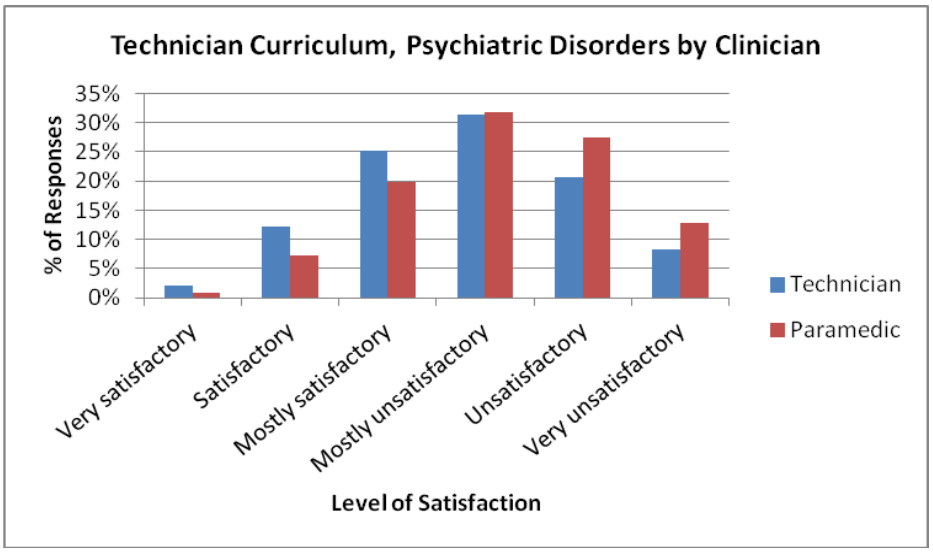

Figure 48: Technician curriculum & psychiatric disorders by Technician and Paramedic.

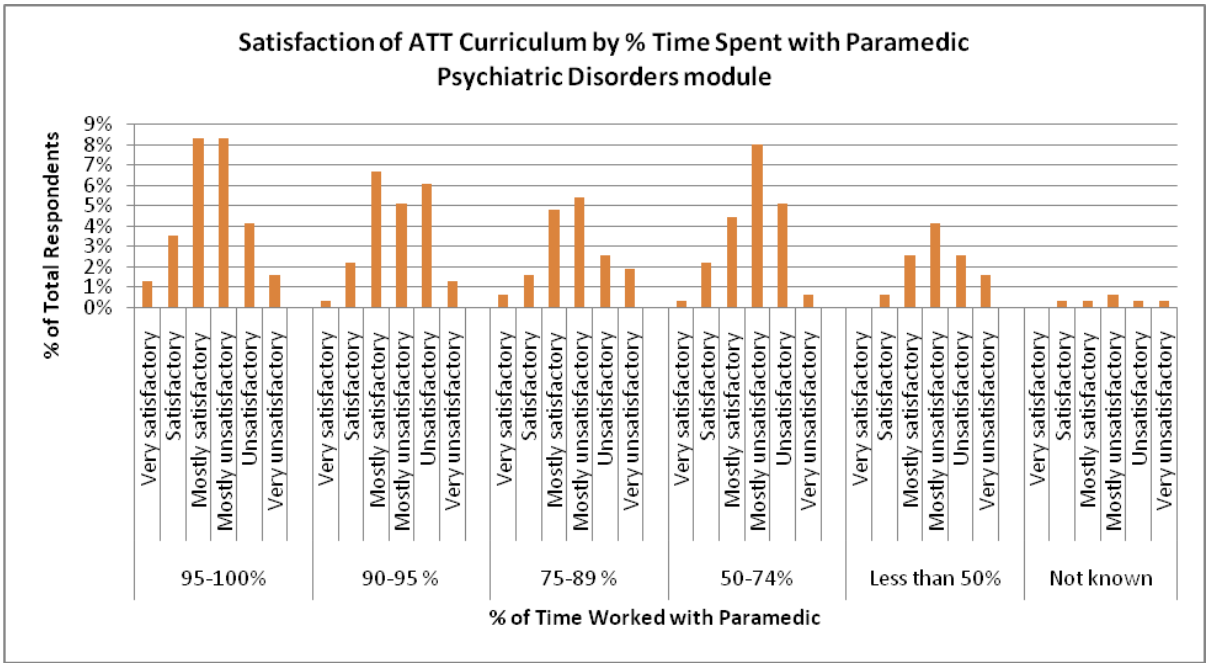

Figure 49: Technician curriculum psychiatric disorders by time spent with paramedic.

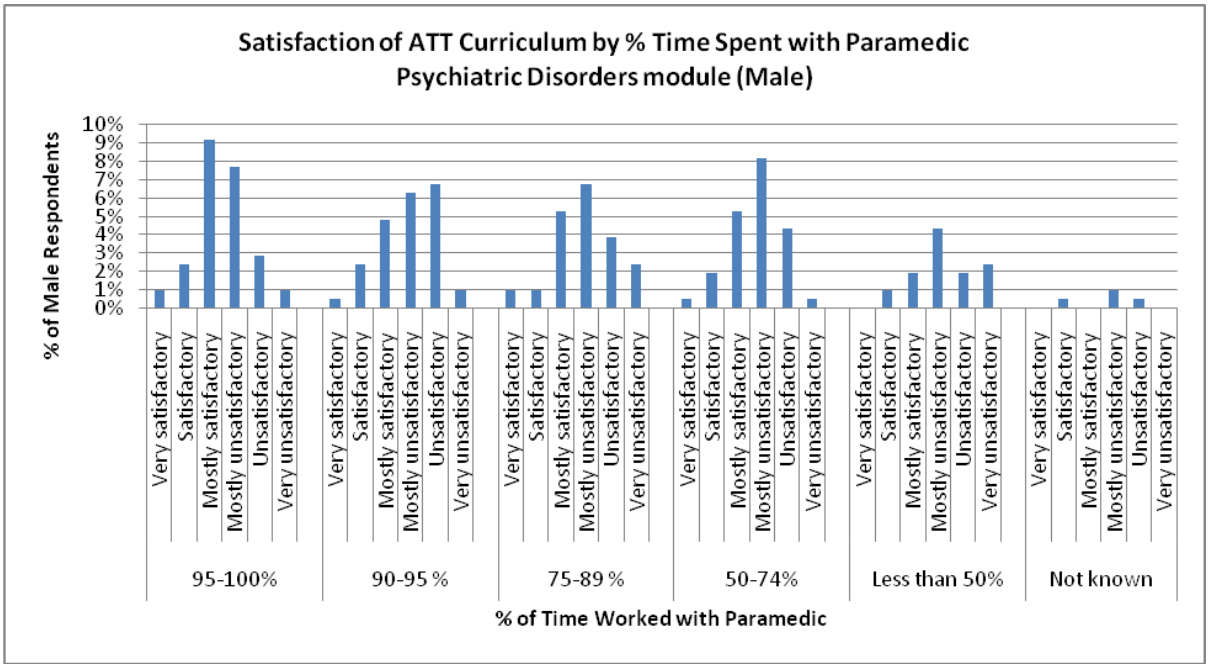

Figure 50: Technician curriculum psychiatric disorders by time spent with paramedic (male technicians).

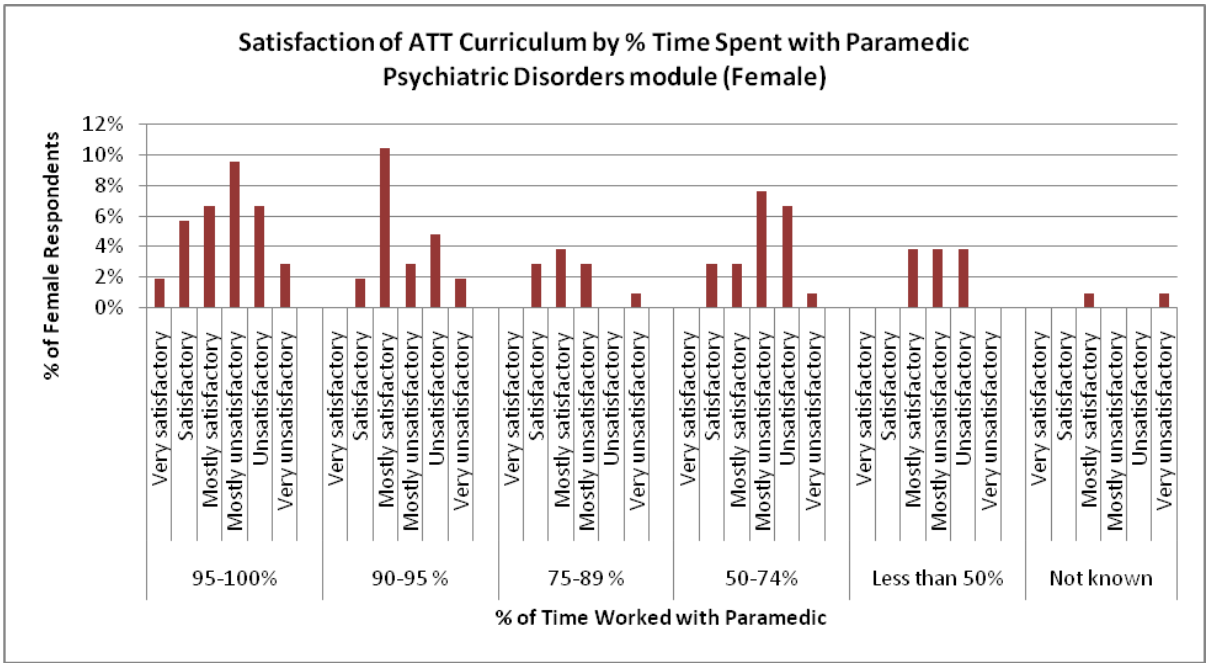

Figure 51: Technician curriculum psychiatric disorders by time spent with paramedic (female technicians).

This module was rated poorly, with a majority of technicians and paramedics finding it unsatisfactory. This was true for both male and female respondents and from the data presented in figures 49, 50 and 51 there appears to be a tendency for those working with a paramedic for more of their time to be less dissatisfed with the module.

VII.1.14 Paediatric emergencies ATT Training Module

Table 16 and figures 52 to 56 provide the analysis of responses related to the module *Paediatric Emergencies.*

Overall this module is consdered unsatisfactory by a majority of respondents, whether they are technicians or paramedics and also whether they are male or female.

Table 16: Technician curriculum & paediatrics

		Technician or paramedic		Total
		Technician	**Paramedic**	**Technician**
Tech curriculum &paediatric emergencies	Very satisfactory	9	8	17
	Satisfactory	50	40	90
	Mostly satisfactory	98	88	186
	Mostly unsatisfactory	109	98	207
	Unsatisfactory	76	68	144
	Very unsatisfactory	41	46	87
Total		383	348	731

Ambulance staff often report a degree of under confidence in dealing with this patient group and there may be issues of skill fade due to the relatively rare opportunities to address the critical care and other needs of children. As with the managmeent of psychiatric disorders, it is likely to be an area that could benefit from curriculum revisions to further training.

Satisfaction levels are certainly somewhat lower than in many other areas and the association between working with a paramedic and satisfaction might have been expected to be higher.

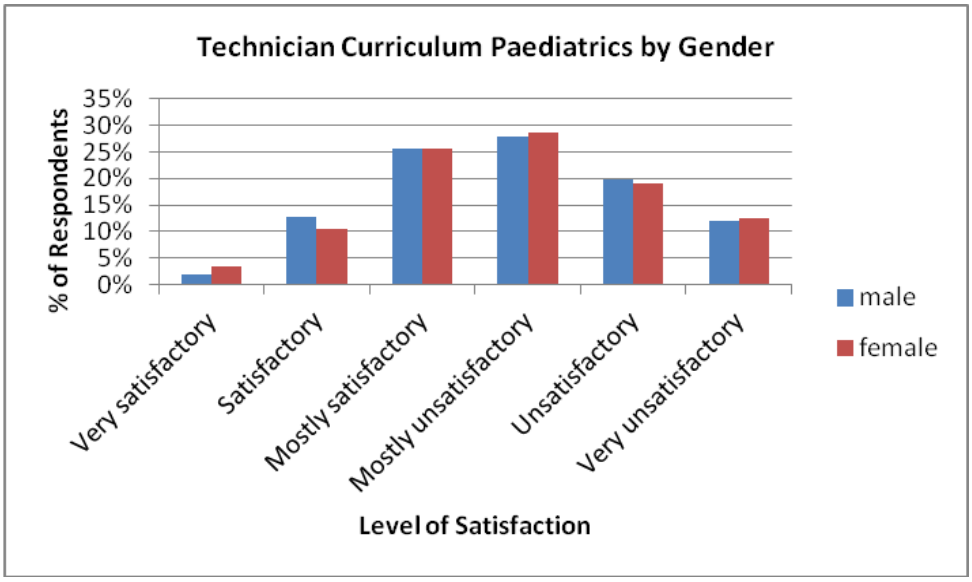

Figure 52: Technician curriculum & paediatrics by gender.

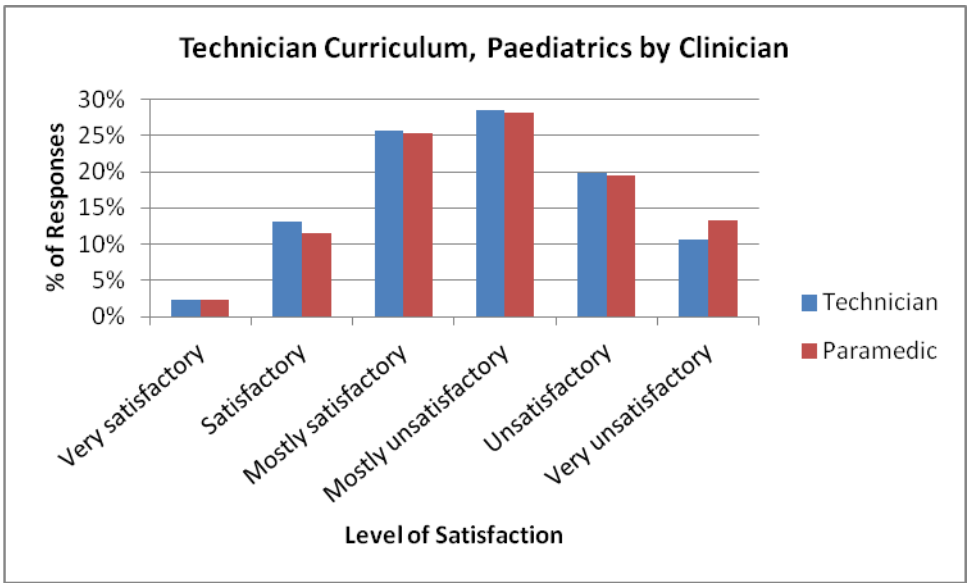

Figure 53: Technician curriculum & paediatrics by Technician and Paramedic.

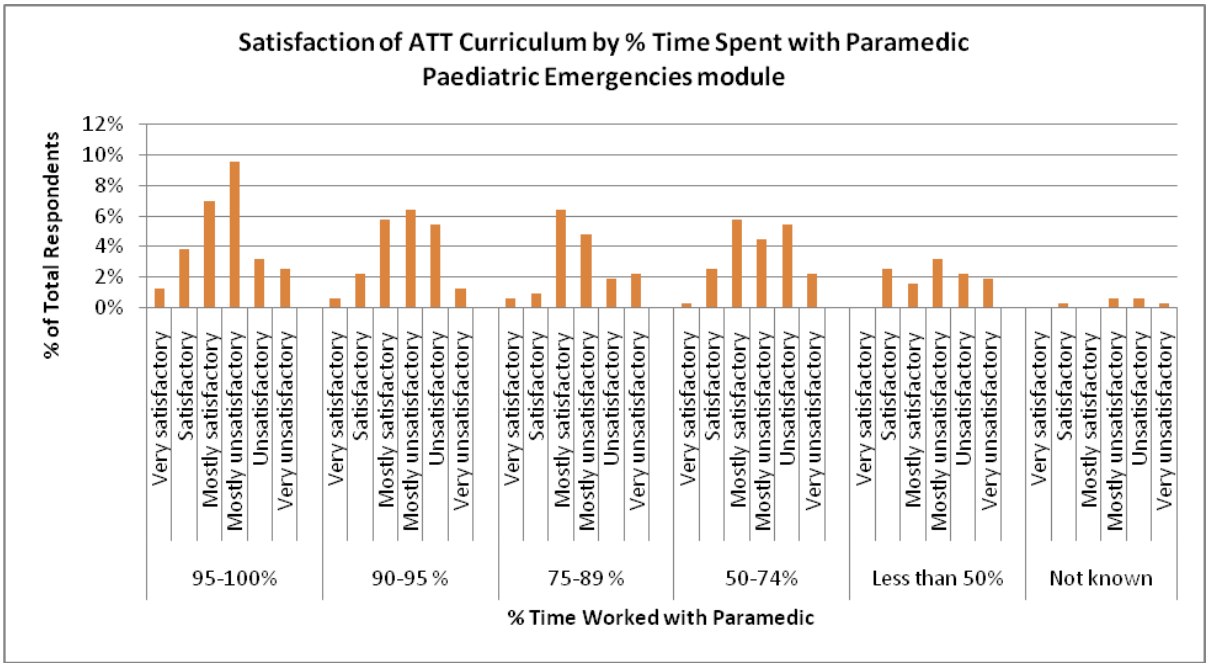

Figure 54: Technician curriculum paediatric emergencies by time spent with paramedic.

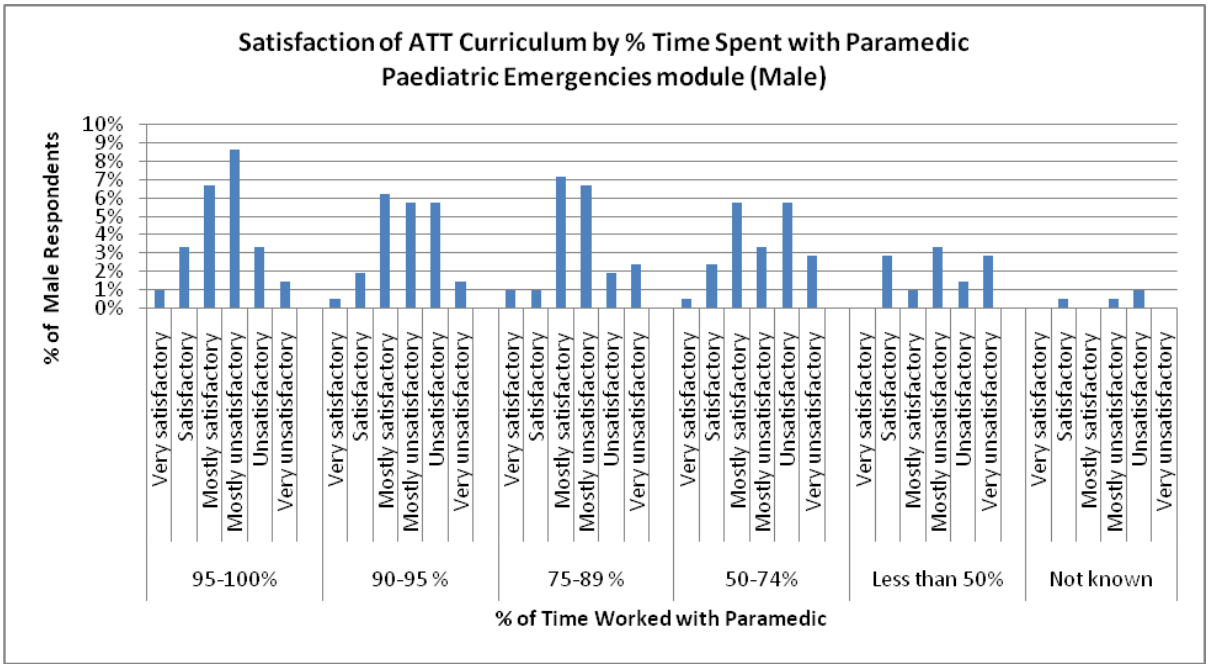

Figure 55: Technician curriculum paediatric emergencies by time spent with paramedic (male technicians).

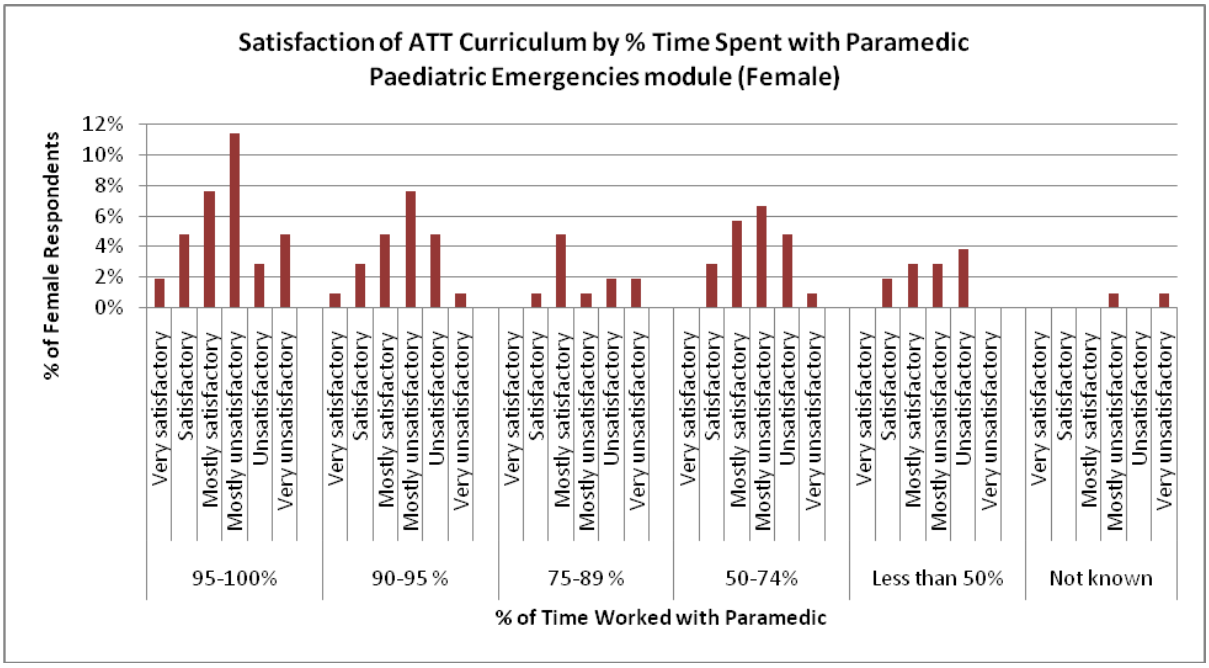

Figure 56: Technician curriculum paediatric emergencies by time spent with paramedic (female technicians).

There was a slight trend towards increased satisfaction by technicians when working with a paramedic but this was not as strong as indicated in some other modules.

VII.1.15 Training and educational opportunities

This section explored the participants' views in relation to potential educational opportunities and demonstrated a clear trend in favour of moving to validated educational qualifications for both technicians and paramedics. Staff seemed to be clearly ahead of policy makers and most other key stakeholders in recognising the desirability of qualifications as opposed to vocational credentials that would not hold currency outside the Ambulance Service. This area of the data and its relationship to the wider study objectives will require further research, but is considered a major theme within the discussion section.

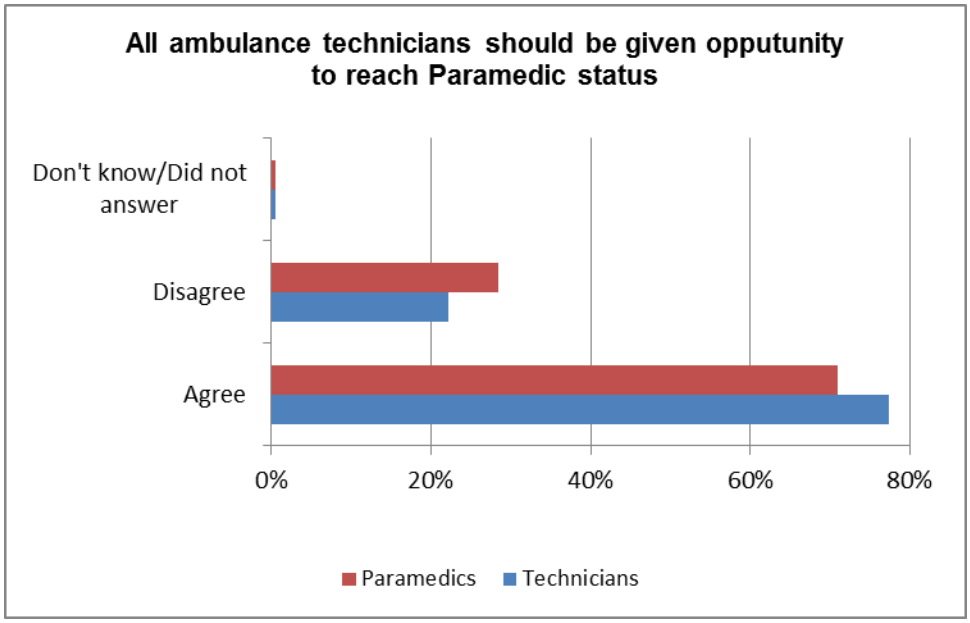

Figure 57: Programmes for technicians to reach paramedic status

Figure 57 shows that the majority of both paramedics and technicians believe there should be an opportunity for technicians to reach paramedic status. It is interesting to note, however, that some staff, and indeed a sizable minority, disagree.

Table 17: Higher Education choices of Technicians and Paramedics

If there were to be a standard academic qualification that incorperated Ambulance Technician status it should be at?						
	Technicians			Paramedics		
Level	First or only choice	Second choice	Third choice	First or only choice	Second choice	Third choice
Honours Degree[3]	60	9	67	0	0	3
Diploma in Higher Education[2]	118	74	4	111	38	10
A Certificate of Higher Education[1]	144	36	41	185	44	7
None of the Above	12	5	11	21	6	23
No Academic Award	30	10	6	41	11	27

1. Equivalent to the first year of a Degree programme and worth 120 academic credits, 120 at Level 1 [at the time of the study, now level 4].
2. Equivalent to both the first and second years of a Degree programme and worth 240 academic credits, 120 at Level 1 and 120 at Level 2 [now levels 4 and 5].
3. 360 academic credits, similar to other AHPs and many nursing programmes [previously at level 3, but now classified as level 6].

.

Table 18: Standard Academic Qualifications incorporating Technician and Paramedic requirements.

If there were to be a standard academic qualification that incorporated both the Ambulance Technician and Paramedic requirements to achieve registration, the combined award should be set at?						
	Technicians			**Paramedics**		
Level	**First or only choice**	**Second choice**	**Third choice**	**First or only choice**	**Second choice**	**Third choice**
Post Graduate Cert[3]	38	18	28	48	14	31
Degree	167	37	29	161	41	10
Diploma in Higher Education[2]	116	63	26	124	44	27
A Certificate of Higher Education[1]	25	20	46	11	12	28
None of the Above	10	2	4	10	1	7
No Academic Award	14	1	4	11	1	4
	NVQ 3 or 4			NVQ or above		
	Specific ambulance award (Miller)					
	GCSE inc eng + maths					

1. e.g. below other AHPs and nurses.
2. Similar to many nursing programmes.
3. Graduate entry level like many medical programmes.

Tables 17 and 18 clearly demonstrate that the majority of respondents considered a Diploma/Foundation Degree or BSc the most appropriate academic level, incorporating 'tech' level to paramedic level practice. This is quite surprising given that at the time the study questionnaire was being completed there was only one BSc (Hons) level paramedic programme in the UK, with only one other country in Europe offering paramedics education to this level [Hungary]. Even in countries such as the United States and Australia, few degree programmes for paramedics existed, making the views of respondents even more far sighted. However, while such programmes for paramedics were rare, other AHP programmes had already mandated that degree level should be minimum level for registration with the

registrant body and it may be that it was this reference point that influenced many of the answers to this question.

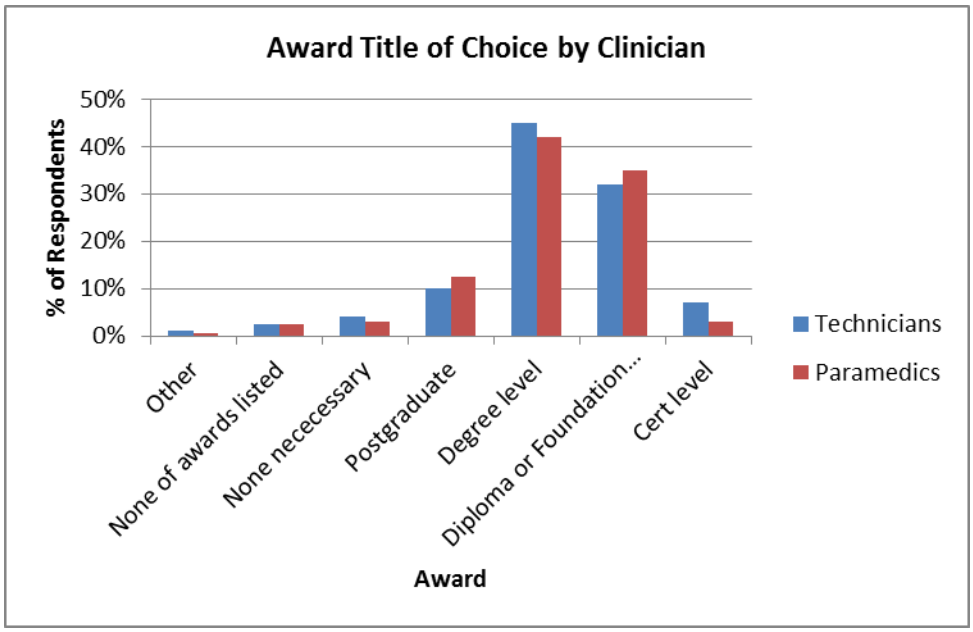

Figure 58: Percentage of selection

Figure 58 shows that both technicians and paramedics concur that staff should enter programmes that lead to an academically accredited qualification and that these should be at the level of Dip HE/FD or BSc. There is possibly an assumption that this state of affairs might happen 'automatically' on an in-service, and importantly paid basis, but it is not possible to test this assumption. Equally, issues of cost were not addressed and this was a limitation and an oversight. Certainly, when the question was raised virtually all paramedic training was conducted on a pattern whereby staff were both released on a fully paid basis and without any fees. Such training was therefore something of an expectation for many.

VII.1.16 Ambulance Technician Qualifications

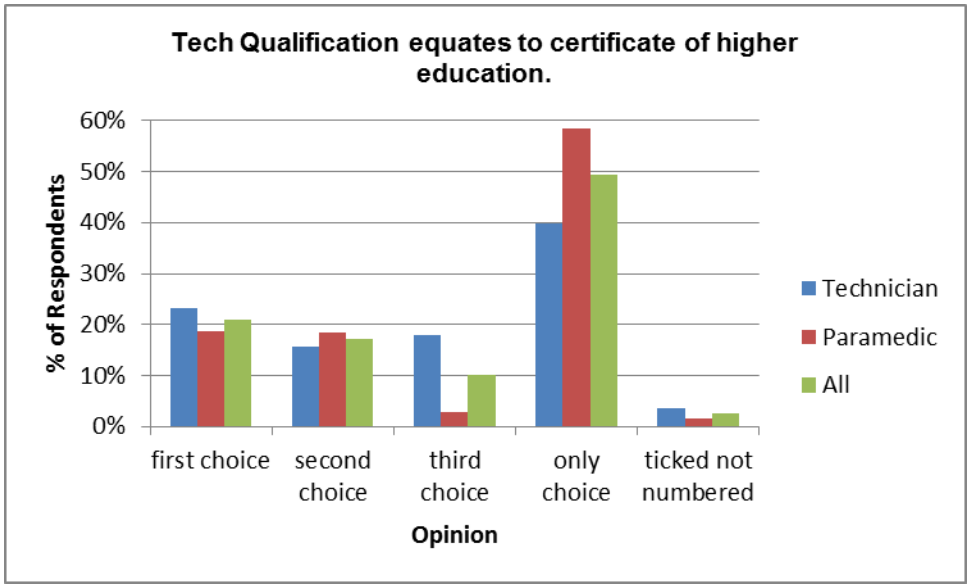

Figure 59: Technician qualification equates to certificate of higher education

Figure 59 illustrates that both paramedics and technicians considered a certificate of higher education to be the most appropriate choice. However, this is arguably beyond the IHCD level, although some IHCD courses have been accredited at this level after some changes in structure and content. A certificate of higher education [or equivalent] remains the registration standard for paramedics today, although there is now a stronger likelihood that the next iteration of the HCPC's Standards of Proficiency and Standards of Education and Training may revise the standard upwards.

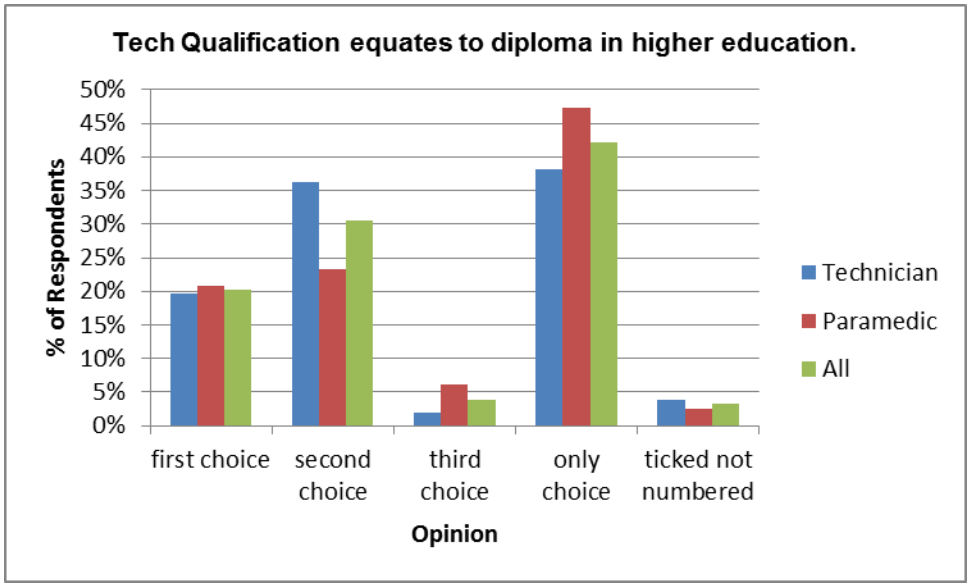

Figure 60: Technician qualification equates to diploma in higher education

While a majority of paramedic and technician respondents consider a diploma in higher education the first or only choice, a substantial minority of the technicians questioned (25%) felt that a diploma in higher education was their second choice (figure 60).

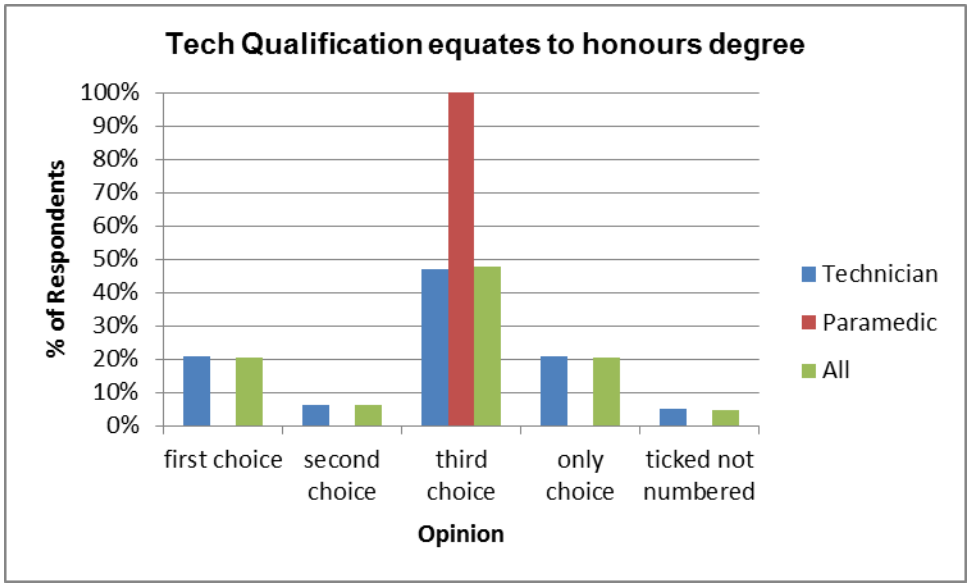

Figure 61: Technician qualification equates to honours degree

Figure 61 clearly shows that paramedics consider an Honours degree their third choice qualification, again an interesting finding when considering the rarity of this level of educational preparation at the time of the study.

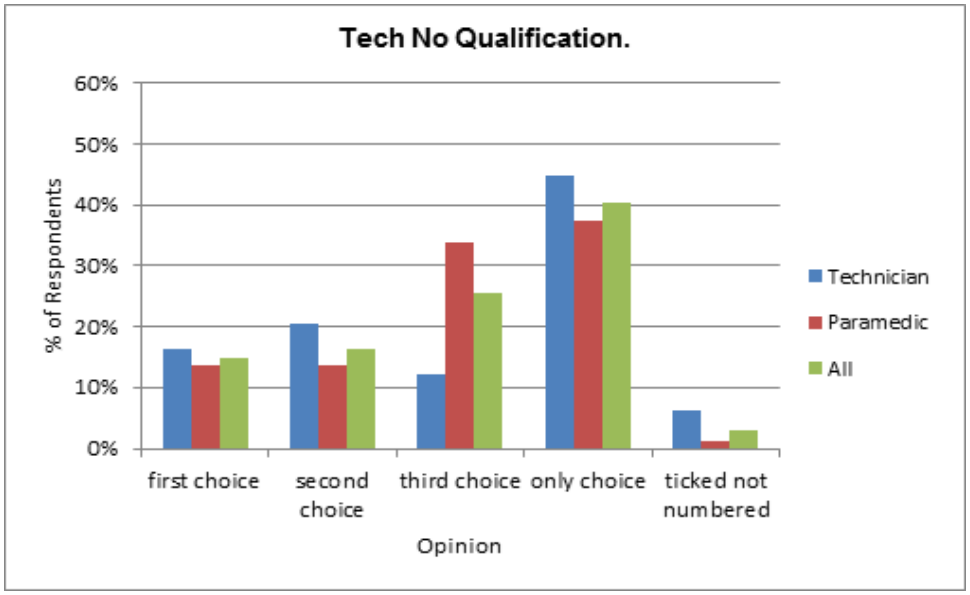

Figure 62: Technician qualification equates no qualification

Figure 62 shows that overall 40% of the clinicians surveyed indicated that a qualification was not necessary at technician level and indeed in the years since the survey was taken the ambulance technician has largely been consigned to history. No academic framework was ever put around it and very few technician courses are run nationally today.

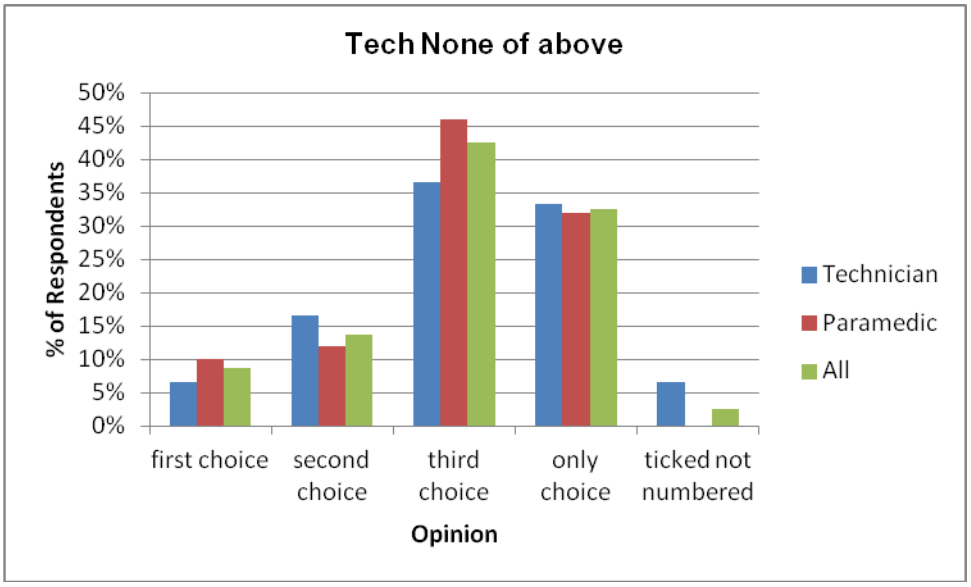

Figure 63: Technician qualification equates to none of the given options

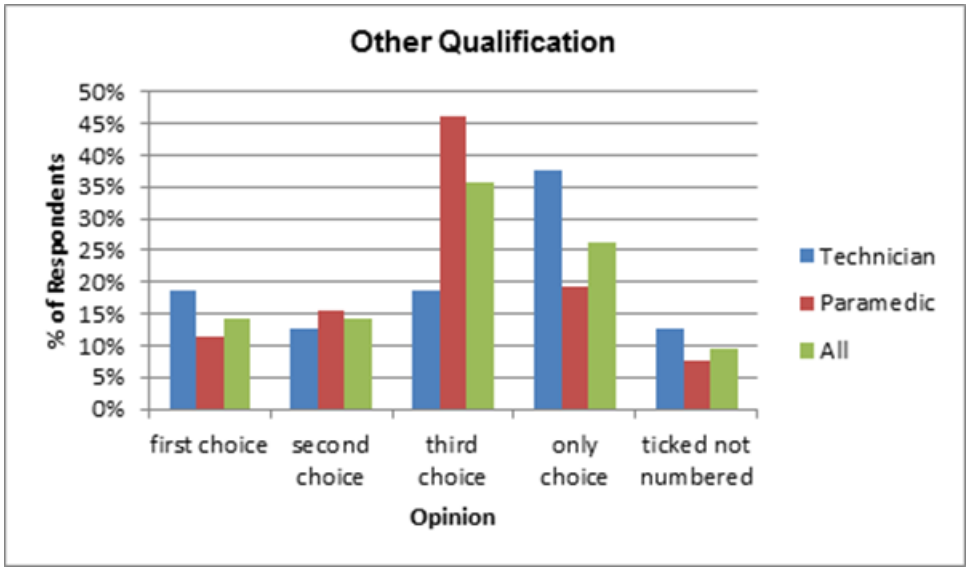

Figure 64: Technician qualification replaced with other qualification

Considering figures 63 and 64, in particular, over 45% of paramedics consider that other qualifications should be offered than those above. While the technician has rather 'withered on the vine,' the ECSW course is now being offered at a BTEC level in some areas of the UK.

The idea of a jointly validated standard of academic qualification that incorporated both the ambulance technician and paramedic requirements to achieve registration was also considered. However, with the relative demise and replacement of the technician grade and the commensurate elevation of the paramedic the question is now somewhat redundant.

Figures 65, 66 and 67 illustrate that degree level is the most favoured qualification with approximately 70% of respondents making this level their first or only choice. Interestingly this was true for both paramedic and technician respondents.

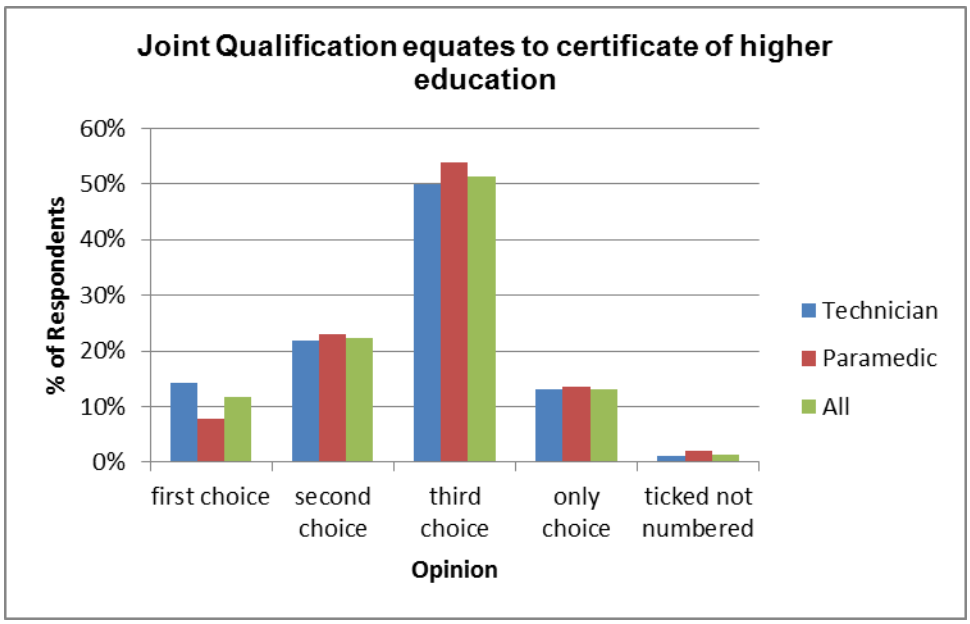

Figure 65: Joint qualification equates to certificate of higher education

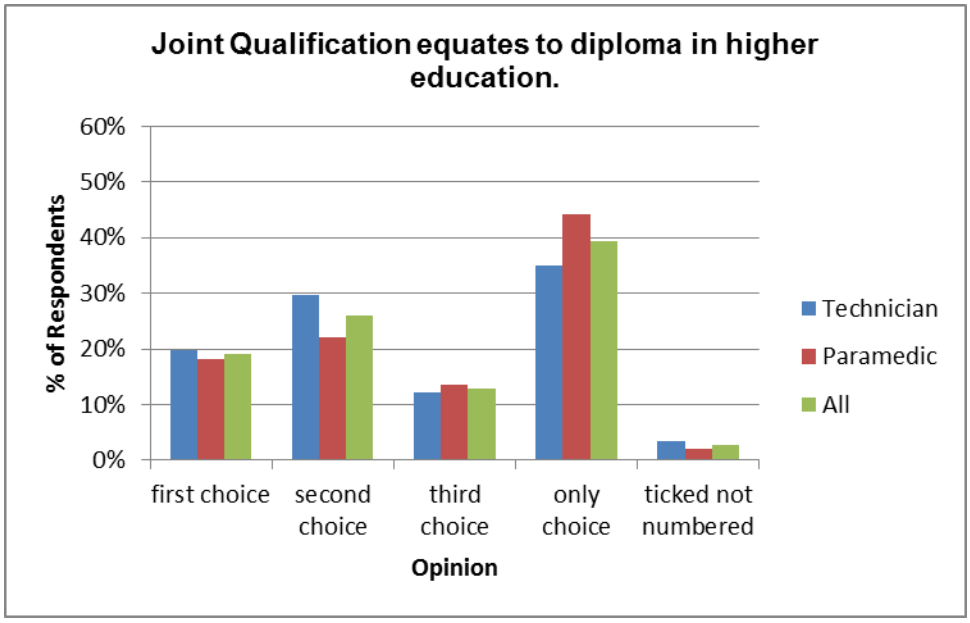

Figure 66: Joint qualification equates to diploma in higher education

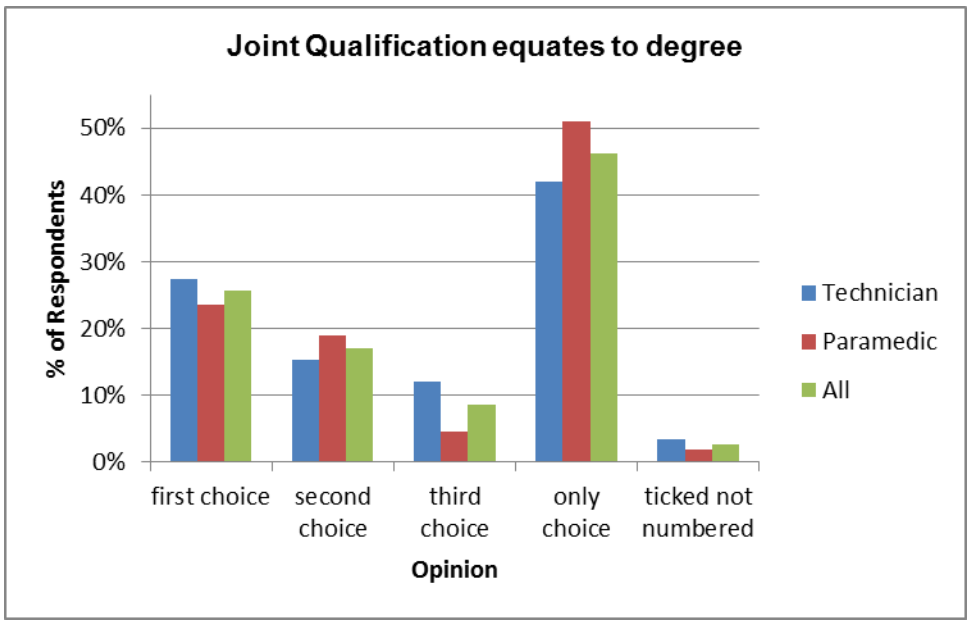

Figure 67: Joint qualification equates to degree, indicating a perhaps surprisingly strong preference for a BSc level award.

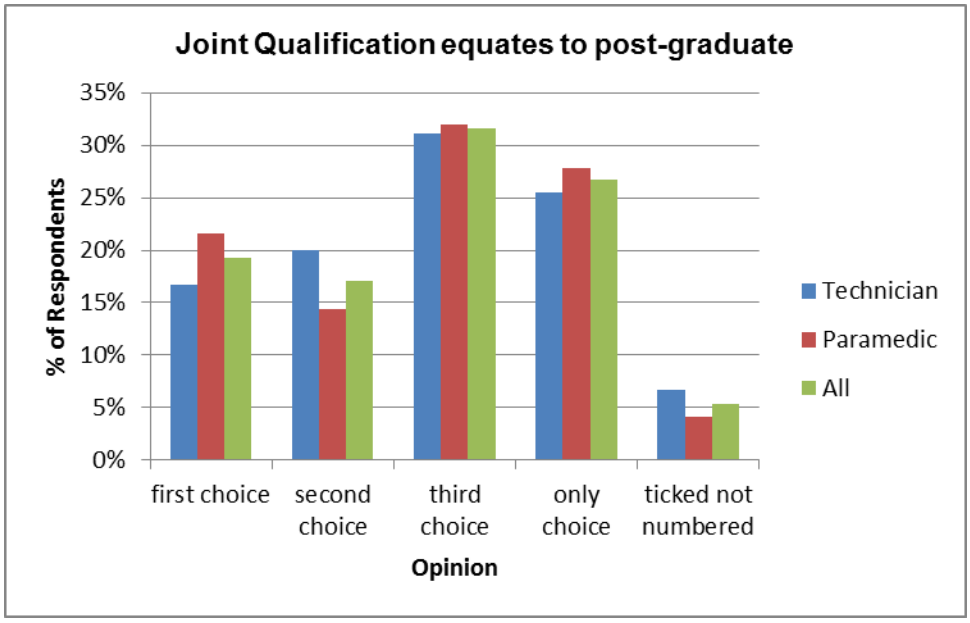

Figure 68: Joint qualification equates to post-graduate.

Even the more established AHPs have tended to shy away from post-graduate entry, although the route is available to some professions, such as physiotherapy, and it is the only route of entry for Clinical Psychology. There may be some lack of clarity as to the implications of picking this option by respondents. Master's level education can, however, be expected to become more mainstream in relation to specialist paramedic practice.

Figures 69 to 82 analyse the responses related to the reasons that would encourage individuals to enter higher education to study a programme linked to paramedic practice or a related field.

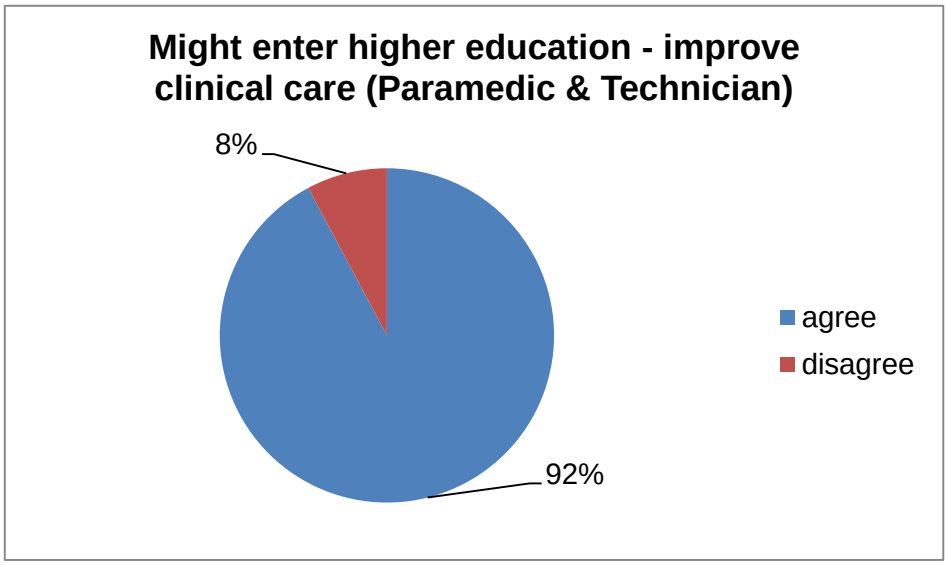

Figure 69: Respondents motivated to seek higher education to improve their clinical care.

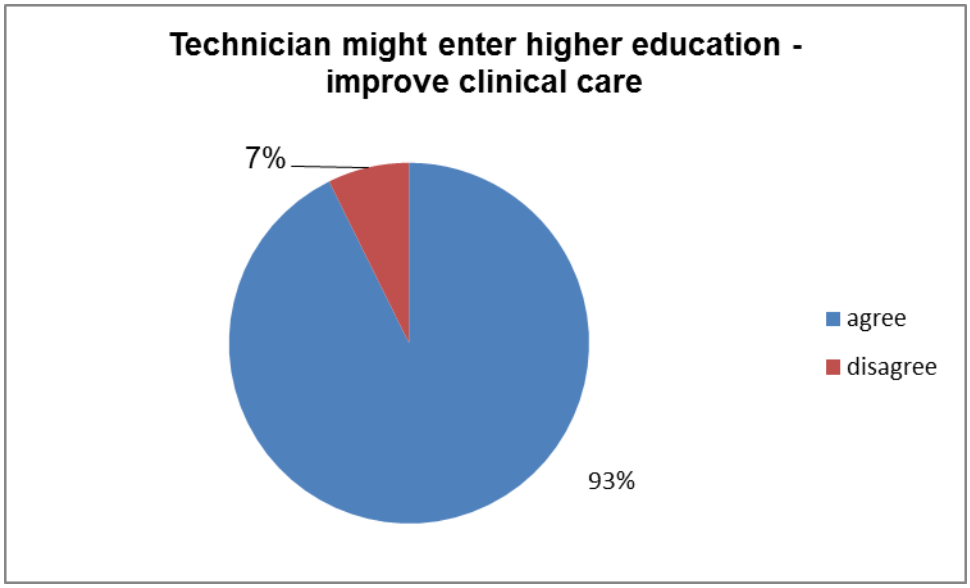

Figure 70: Percentage of Technicians who are likely to enter higher education to improve their patient care.

Figure 70 illustrates that respondents were motivated to seek higher education to improve their clinical care. This is a very positive response and demonstrates the strong inclination of ambulance clinicians to seek to improve the care they provide to their patients.

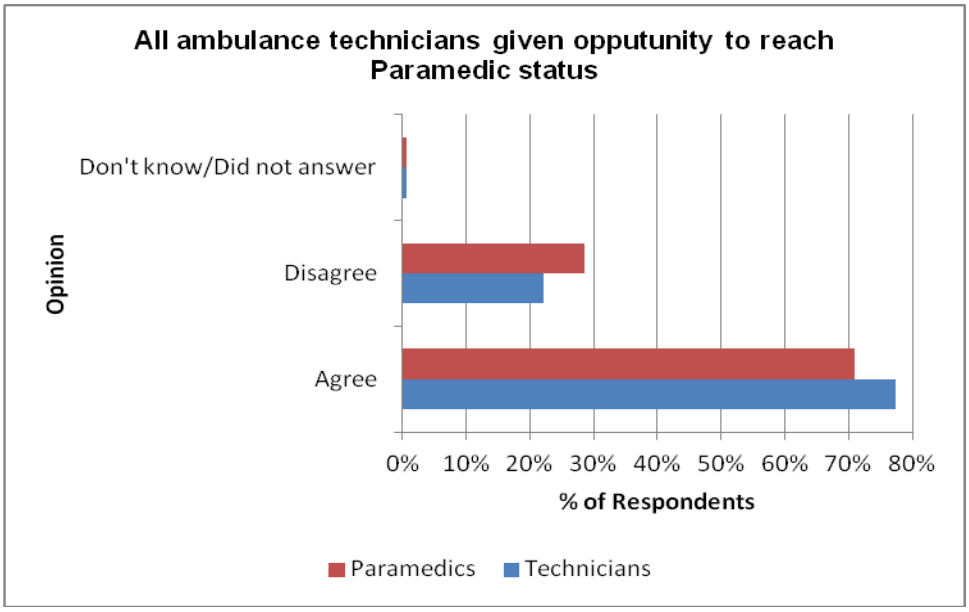

Figure 71: Opportunity for Technicians to Reach Paramedic Status

Figure 71 shows that for all the ambulance technician population the level of motivation is equally high to that demonstrated in the surveyed paramedic population.

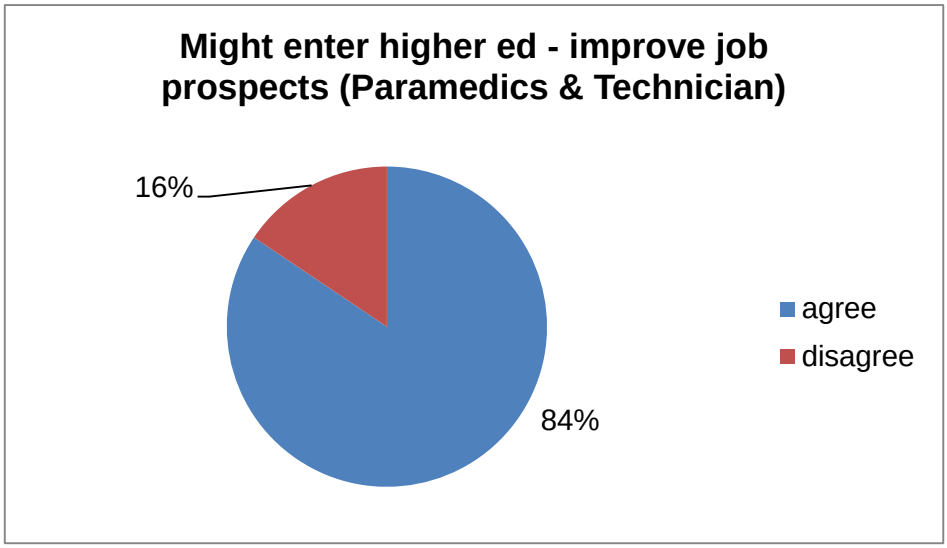

Figure 72: Percentage of Paramedics and Technicians who are likely to enter higher education to improve their job prospects.

Figure 72 shows that the opportunity for technicians to reach paramedic status was, at the time of the study, and as previously recognised, something of the ‘natural order,’ with the technician role often simply a stepping stone. However, while the self improver technician to paramedic route continues to be available it is fast being supplanted by the direct entry route today. In addition where the route continues to be provided by employers, the registration level tends to be at Foundation Degree, not BSc level.

The question as to whether paramedics & technicians might enter higher education to improve job prospects received a very postive reponse with 84% in agreement and it is even truer today that having a paramedic qualification is now almost a universal requirement to further advancement, especially so for specialist practice developmental opportunities, but also often for other non-clinical managerial roles.

Although completed prior to the publication of the paramedic career framework, the notion that additional education improves career prospects appear to have become embedded.

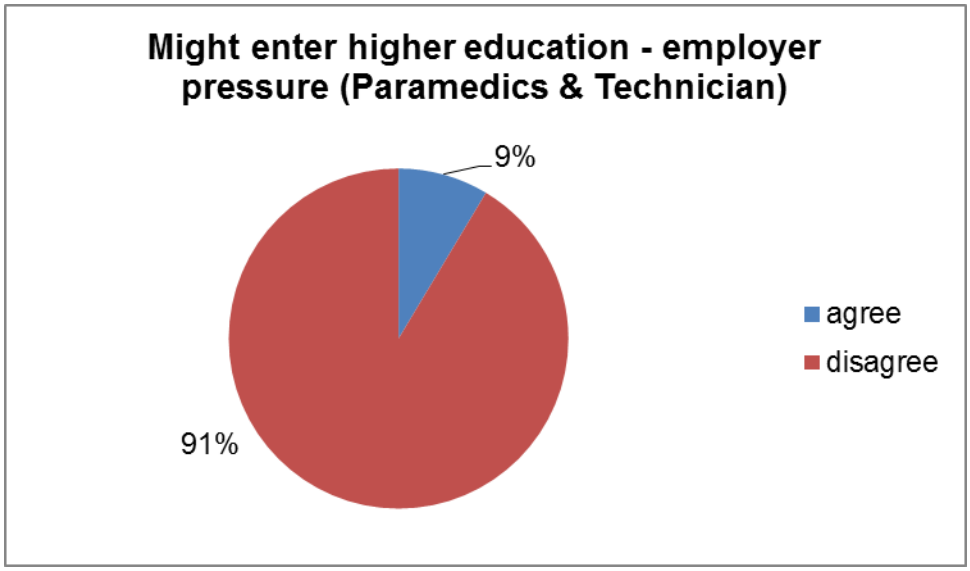

Figure 73: Might Paramedic & Technician enter higher education employer pressure?

This question elicited an extremely negative response, indicating that any desire by employers to enforce educational programmes upon staff is likely to be unrewarding and perhaps reveals a rather independent mindset among ambulance personnel.

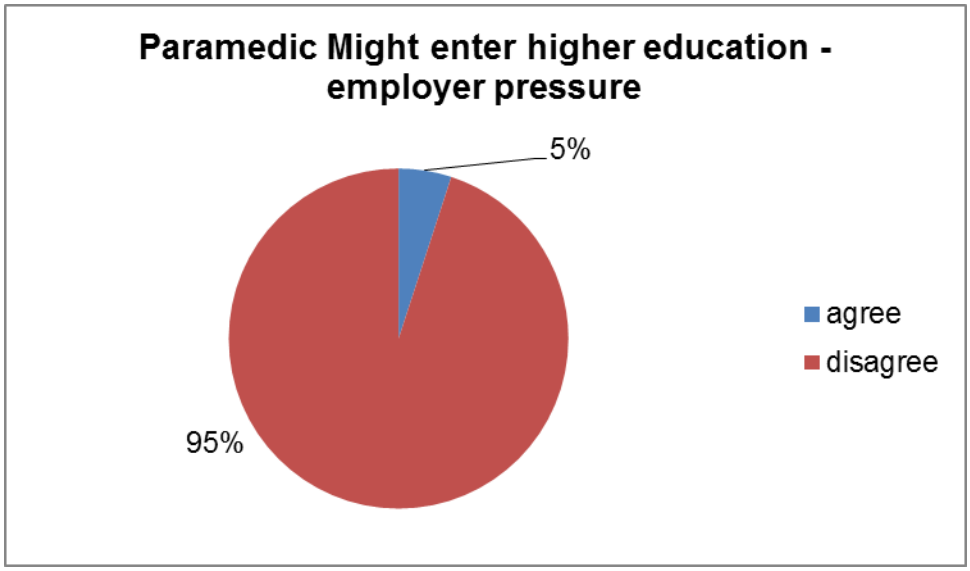

Figure 74: Percentage of Paramedics who might enter higher education due to employer pressure.

Figures 74 and 75 show that the technician respondents are only slightly more susceptible in regard to employer pressure with 88% rejecting employer pressure compared with 98% of the paramedic sample.

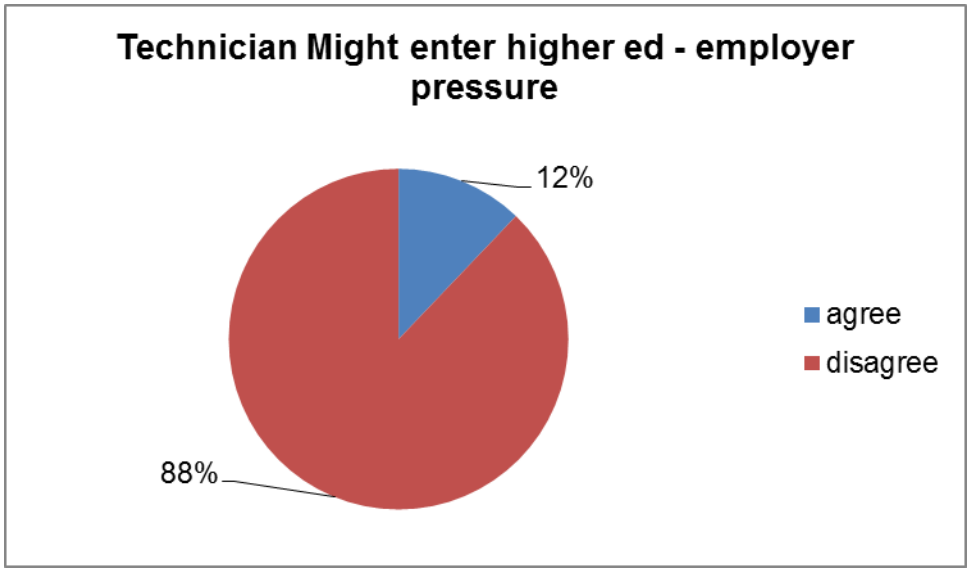

Figure 75: Percentage of Technicians who might enter higher education due to employer pressure.

Figure 75 shows that the technician respondents are highly resistant to what might be perceived as coercive pressure, with 88% rejecting the notion of complying with employer pressure as a driving force to seek additional educational development.

From these tables it is clear that paramedics and technicians would consider continuing their education if it was to improve care of the patient or for self-development reasons. However, from the information available it is evident that the majority of the respondents would be less inclined to respond to direct employer led demands to advance the educational status of the Ambulance Service Workforce.

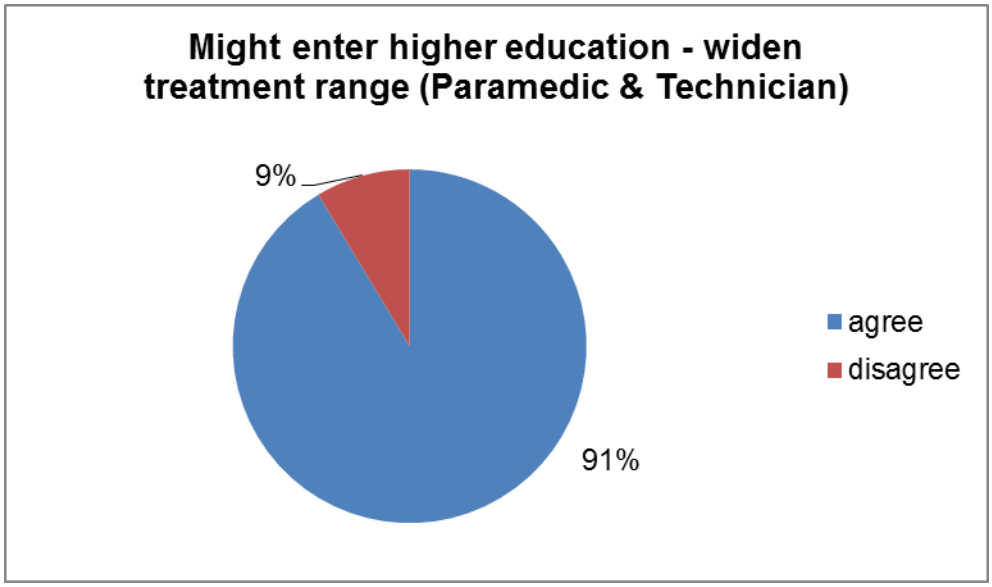

Figure 76: Percentage of Paramedics and Technicians who might enter higher education in order to gain a wider treatment range.

Figure 76 shows that 91% of the respondents might enter higher education if it was to widen their treatment range, a similar, but slightly more focused question to the one above. Traditionally, ambulance technicians and paramedics have sought opportunities to be trained in new items of equipment and patient care technology, this result appears to confirm this trend and perhaps the technical orientation of the Ambulance Service workforce that values skills highly.

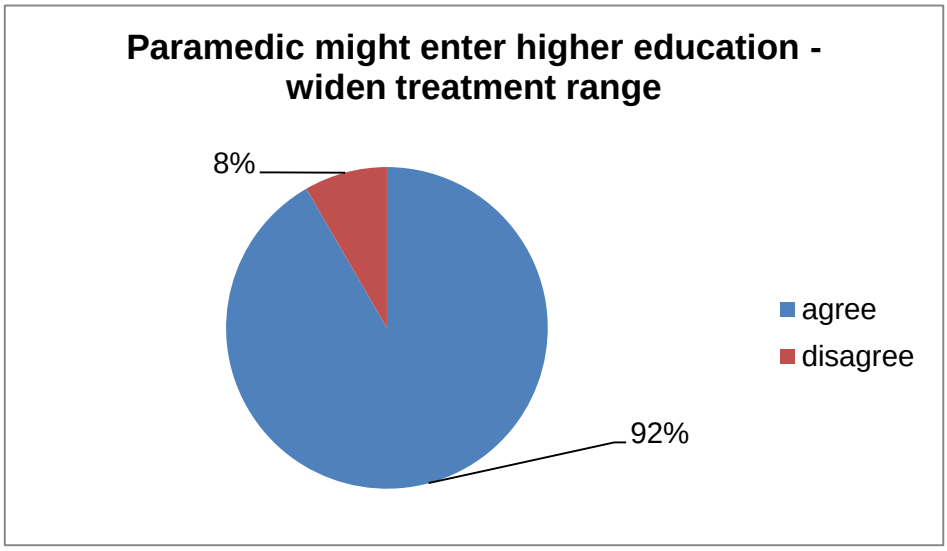

Figure 77: Percentage of Paramedics who might enter higher education in order to gain a wider treatment range.

Figure 77 shows that 92% of the paramedic respondents might enter higher education if it was to widen their treatment range. As with the above result, paramedics demonstrate a strong preference for training and education, which can offer direct patient benefits.

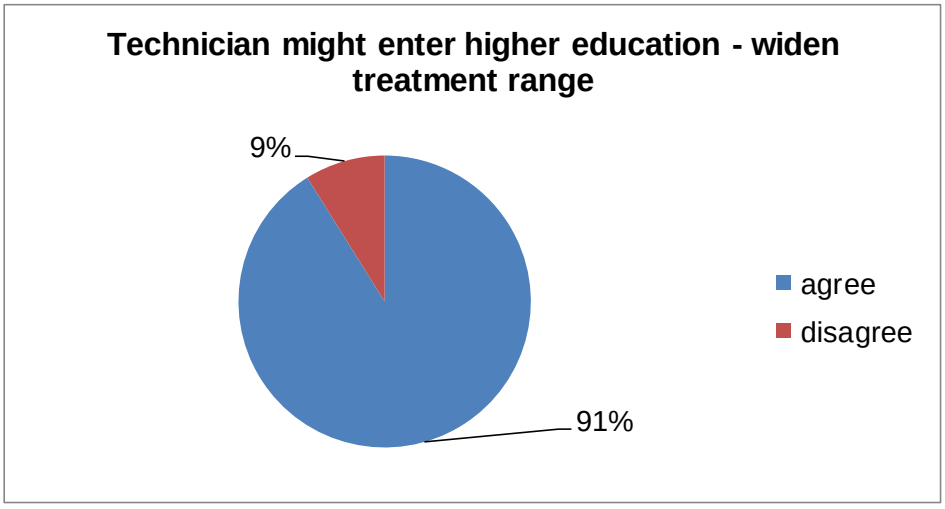

Figure 78: Technicians who might enter higher education to widen their treatment range.

Figure 78 shows that 91% of the technician respondents might enter higher education if it was to widen their treatment range.

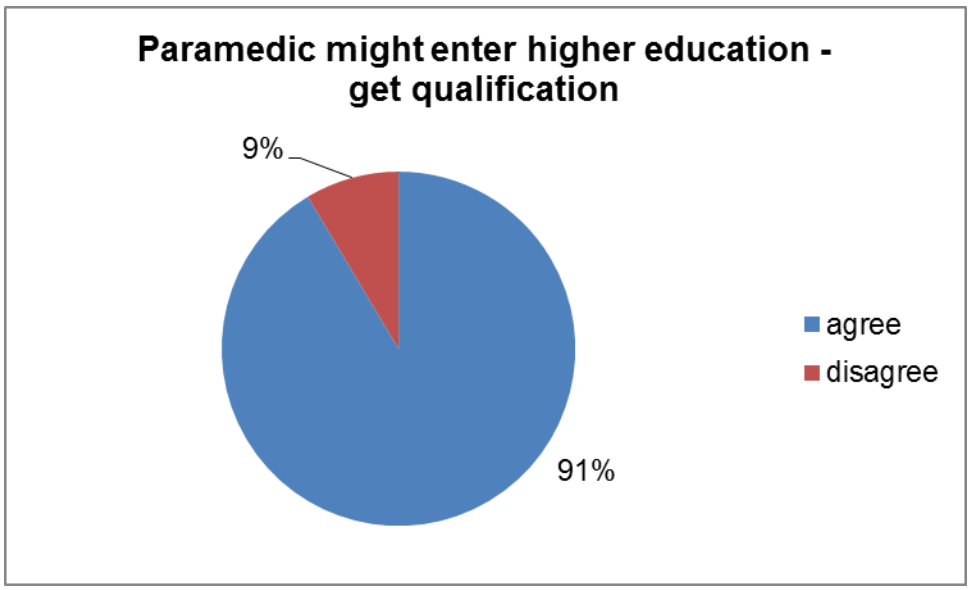

Figure 79: Percentage of Paramedics who might enter higher education in order to gain a qualification.

Figure 79 shows that 91% of the paramedic respondents might enter higher education if it was to get a qualification. For those paramedics who were trained via the vocational route the opportunity to gain valid education credentials appears attractive.

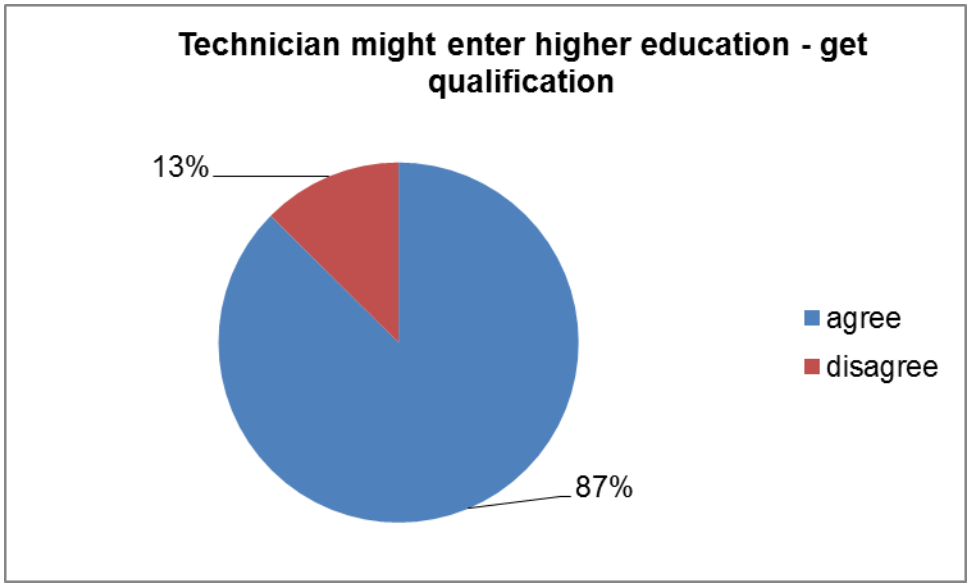

Figure 80: Amount of Technicians who might enter higher education in order to gain a qualification.

Figure 80 shows that 87% of the technician respondents might enter higher education if it was to get a qualification, demonstrating the same inclination as for paramedic respondents shown in Figure 78.

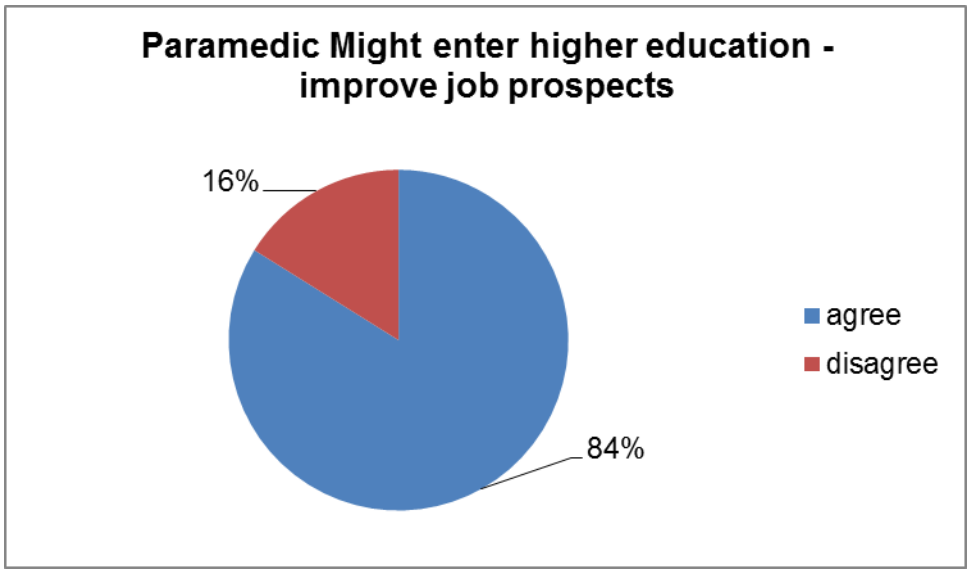

Figure 81: Percentage of Paramedics who might enter higher education in order to improve their job prospects.

Figure 81 shows that 84% of the paramedic respondents might enter higher education if it was to improve their job prospects. Clearly improved prospects, including promotion are powerful synergistic inducements to the paramedic workforce.

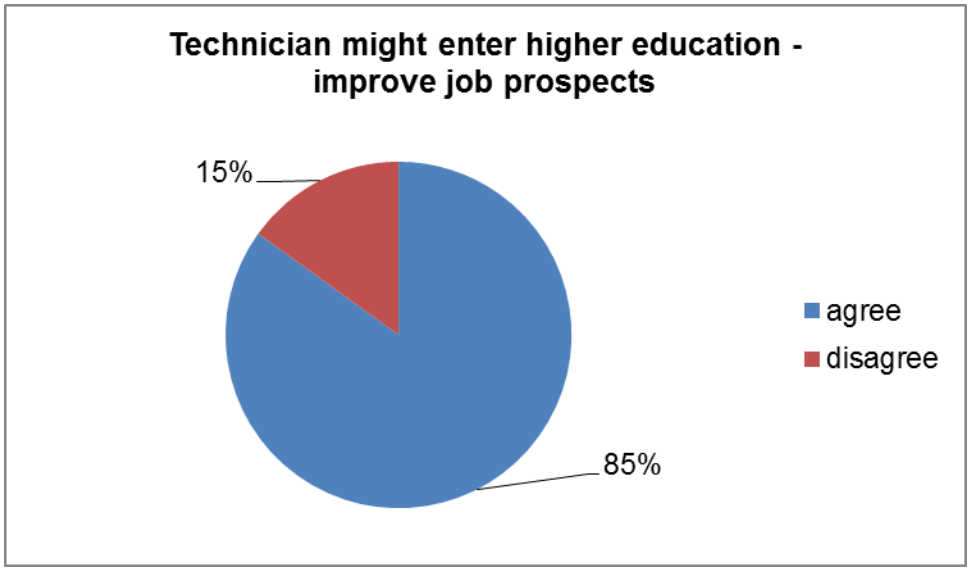

Figure 82: Percentage of Technicians who might enter higher education in order to improve their job prospects.

Figure 82 shows that 85% of the technician respondents might enter higher education if it was to improve their job prospects and this compares with the paramedic respondents.

VII.1.17 Summary

The survey was designed to explore the preparation and views of both technicians and paramedics and to consider a range of specific themes in relation to their satisfaction, insights and aspirations for the future of both themselves as individuals and, to an extent, for the emerging paramedic profession as well.

Results for Phase A of the study initially considered demographic factors and included details such as return rates. Of the 3000 questionnaires, which were allocated on the basis of 50% for ambulance technicians and 50% allocated to paramedics a return rate of 24% was achieved, both groups responding at very similar levels. Issues such as gender were considered and it became apparent that female participation in the Ambulance Service had increased progressively over the last few years, a finding exemplified by the relatively fewer females in the longer service, i.e. service over 20 year point. Female ambulance technicians did however progress to paramedic training a little earlier on average than male technicians.

The origins of staff were also addressed and this is an area that has changed radically over the last 10 years. Many of the respondents joined the A&E part of the service from other positions within the organisation. Fifty eight percent came from either the non-emergency patient transport operation, where they had functioned as Ambulance Care Assistants (ACAs) or from the control room, where staff had been previously employed as emergency medical call takers. The remaining 42% had joined the organisation directly as trainee Ambulance Technicians. A high percentage of respondents when asked about the value of ACA training as a pre-requisite for emergency ambulance duties felt that this should be either mandatory or encouraged, a view that is currently something of a political vogue today in light of the Francis report.

When questioned about preparedness in respect of dealing with category ‘A,’ life-threatening, ‘B,’ serious, but not life threatening, and ‘C’ neither life-threatening or

serious, respondents generally felt equally well prepared to manage these calls. This result was not expected and is important when considering the changing role of the Ambulance Service and paramedics in particular. The quality of content of ambulance technician and paramedic programmes were also explored and it was possible to demonstrate clearly which elements were felt to be most and least valuable. A surprising finding was the apparent association between the value technicians, in particular, found in relation to elements of their programme and the time they spent working with paramedics, with perceived value increasing sharply as time spent with a paramedic increased to the 90% plus level. Other interesting findings are the strongly supported views that both ambulance technician and paramedic preparation should become educationally accredited, together with the value placed on being able to improve patient care through improved education.

In the event and given the changing circumstances within health care generally and the Ambulance Service specifically, it is ever more apparent that education and training provide the single largest factor in enabling the service to morph into a more eclectic organisation with broader capabilities. There is an apparent synergy between these changes, the status of the paramedic in particular and their ability to undertake their role more effectively seems to resonate with the respondents to a significant extent. The impact of these results is, therefore, a major focus within the discussion section.

VII.1.18 Reflection on the Emergent Research Design

Previous sections (I.3 and I.4) set out the case for a necessary extension of the initial research focus from a questionnaire based approach to one that incorporated a second phase incorporating Horizon Scanning. There were many logical reasons for this, but the process of transitioning from one to the other was not entirely linear. This reflection, informed by Gibbs (1988), is designed to help the reader appreciate more fully why certain choices were made in relation to the research design framing this study.

At the transfer stage a decisive point in the process had been reached and yet there did not appear to be an obvious way of making best use of the emerging data, largely due to the pace of change that was happening in the field of practice related to the study. This led to feelings of concern and discomfort as there was a risk that the project might fail for want of being able to shape it into something that would be practically useful in terms of both adding to the literature and in respect of taking the paramedic profession forward. There was always an implicit assumption that the ultimate outputs would be of value in understanding how the paramedic profession evolved and how it could be further developed successfully.

From an evaluative perspective it appeared that while the information in relation to the views and opinions of staff were certainly useful and, to some extent, unexpected, there seemed to be a need for a more strategic context in which to frame the changes that were taking place. The analysis of the situation revealed that there would have to be a further stage that could accomplish several ambitious

objectives; (i) take a more eclectic and strategic approach, (ii) take a future oriented line of enquiry and, in doing so, attempt to overcome the immediate concern that revolved around the danger of information becoming outdated much more rapidly than had been expected. There seemed no easy way to achieve these objectives. Devoting a second stage to the theme of education and patient safety did seem to be promising; ultimately this area did, in fact, attain greater national prominence in terms of the Francis Report. Entirely serendipitously I became aware of the Department of Health's Horizon Scanning unit in Birmingham. Work commenced to prototype a methodology building on this area and much later this became incorporated into a sub-section of the thesis. This form of methodology was relatively unknown to the researcher, but greatly appealed because it had the capacity to meet the desire to take a much more strategic viewpoint, while also overcoming the risks of data becoming redundant. It was ultimately adopted to provide the methodology for the second phase of the research process.

Chapter VIII

Methodology: Phase B – Horizon Scanning

VIII.1/ Phase B – Research Design and Methods

Horizon scanning is still a relatively new technique and it could be argued that, although it is finding increasingly widespread application, particularly in the West, as commented on by Reuter's correspondent Peter Apps in August 2012, its evolution into a fully accepted research tool is not yet complete. Nevertheless, it is increasingly being seen as an essential tool that enables organisations to anticipate change and as identified earlier in this document, seems particularly attractive to Government, while also finding a place in the area of health technology assessment. This level of acceptability is evidenced by the existence of the DH/National Institute of Health horizon scanning unit. The methodology is, in principle at least, straightforward and most workers in the field appear to subscribe to the view summarised in 1979 by Graham Molitor who regards the core purpose as taking an 'emerging issues' approach. Molitor also believed that most 'issues' tend to follow a cycle and that 'signals' of weakness or otherwise, in the form of events of one form or another can be plotted on a 'y' axis, against time on the 'x' axis.

Other authorities, specifically Chun Wei Choo (1999), divide the types of 'scan' into four approaches, 'undirected', 'conditional', 'informational' search and 'formal' search. A conditional approach best describes the method followed in this section, in that a topic has been specifically selected with the intention of appraising or gauging the potential impact on, in this case, the paramedic profession and the future complexion of pre-hospital care. Sources can be many and varied, published reports, statistical data, the relevant literature, the position of advocates and organisation, as Lang records.

If used judiciously there seems to be high levels of agreement that it can help in strengthening institutional robustness and strategic insight or, as anticipated in this study, professional understanding in relation to changes in the NHS pre-hospital care environment. One telling fact is that the military are intensive users of Horizon Scanning techniques, often using them in combination with other methods, such as scenario planning.

Brown (2007) has drawn upon work developed by a commercial organisation 'Technology Futures'. In the non-military sector, horizon scanning has found particular application in healthcare, with an emphasis on new technological devices, drugs and clinical procedures.

The Horizon Scanning process, as Brown et al (2005) note can be conceptualised as 'systematic' progression, either continuous or periodic in nature, [diagrammatically represented in Figure 83]. This design is rather similar in some respects to the widely used 'Strengths, weaknesses, opportunities and threats', or SWOT analysis

which is familiar in the business world and beyond. The Department for Environment Food and Rural Affairs (DEFRA) represents an intensive user of the methodology, even publishing a regular 'horizon scanning' newsletter in partnership with Cranfield University's Centre for Risks and Futures. The DEFRA approach identifies a five-stage process: gathering information, spotting signals, watching trends, making sense of what is occurring, and determining a response.

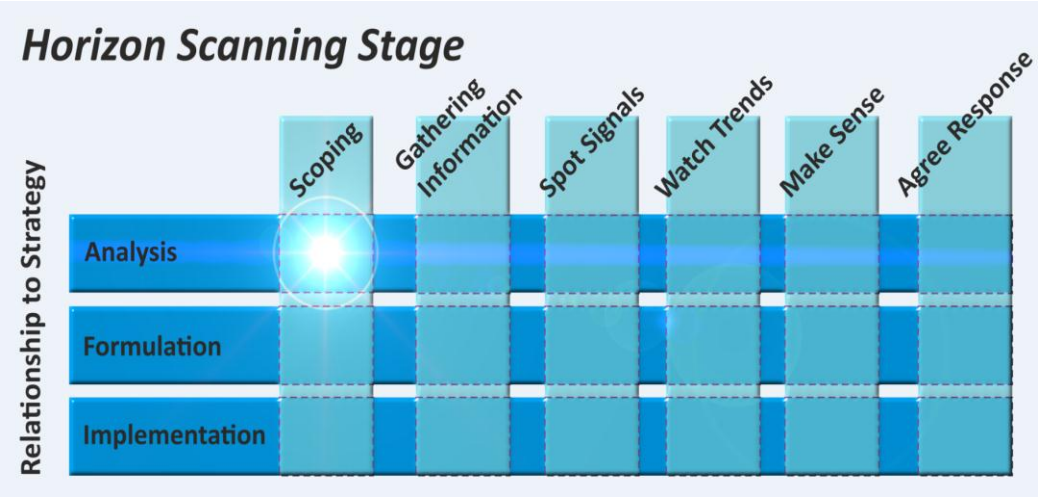

Figure 83: Relationship to strategy - adapted from the DH Horizon Scanning Unit

The UK Ministry of Defence (MoD) has commented on the use of the technique, which is used by its own Development, Concepts and Doctrine Centre (DCDC) suggesting that the first priority is to define the 'horizon' itself. In the case of this study, the time horizon is 18 years and the breadth of the horizon is 4 professional groups operating in a rather complex political, environmental, social, technical, legal and legislative context (PESTLL) to which it is necessary to add the intensive financial and equally pressing professional imperatives (Wilson, Charmantier and Hadfield (2008).).

The value of horizon scanning is often regarded as two-fold, i.e. the value of undertaking an assessment and the value derived from the results of an assessment. Value, at least in general policy-making terms, also results from providing 'timely' information that policy makers can use in decision-making (Douw et al 2003) In this case it is used to help acquire information about signals and trends, which are a particular interest to those engaged in using horizon scanning methods. Although not generally used to assess future workforce options this is, after all, one of the original aspects of the study, it is the ability to capture 'weak signals' and to interpret those which are noteworthy. The possibility of using the resulting information to help build scenarios provides an attractive and powerful combination which could help assess the trajectory of each of the workforce groups and their likely 'penetration' of pre-hospital care and the Ambulance Service in the next decade.

Having determined the timeframe and established what the 'technology' options are, generally a two-stage process, as described by Douw et al (2004) it involves filtering and precise selection of technologies, also referred to as 'priority setting'. In this case the included options were Paramedics, Medically qualified personnel (at first registration level, but with further consideration as to the effect of seniority later), Nursing personnel, and New Practitioners. Ambulance technicians were eliminated from participation at this stage, due to regulatory and scope of practice incompatibility with the four remaining groups. EuroScan (2005) offers guidance as to what might constitute valid criteria for entering into the horizon scanning process in the context of health services as follows:-

1. What are the long-term financial consequences?

2. Will service re-design be required?

3. Political, ethical, legal environmental or social issues associated with the technology

A focused literature review follows, augmented subsequently in the discussion section, incorporating any systematic reviews or other relevant controlled studies. No randomised controlled trials comparing paramedical and medical personnel have been published, but lower order data is available. However, these papers tended to be narrow in focus and methodologically contentious and neither did they help capture the broader historical and evolutionary factors that were believed to be of value.

In order to establish the fullest possible appraisal of the context to change, the health care system in which one is operating has to be carefully considered as noted by Henshall et al (1997). Many Horizon Scans appear to have little to say about the strategically important environment within which change occurs, which is of importance when inter-professional factors are involved. Such broader issues were also considered important to the analysis and discussion sections and include matters such as changes in relevant professional body attitude, policy statements etc.

Only a detailed literature review, of both published and grey literature can help capture the range of information necessary and horizon scanning, deliberately takes a broad and eclectic approach drawing upon both key scientific journals, policy, commercial and other sources. These can also include the use of focus and Delphi groups and increasingly Internet based data in some cases. Caution in interpreting the validity of such sources is therefore a significant concern. Such a review also helps facilitate the sub objective of developing a historical summary of the UK Ambulance Service and the emergence of paramedics.

In terms of identifying signals, the method for this aspect of horizon scanning appears sparse indeed. In an effort to place some structure around the process used in this study the workforce options have been arrayed with four key areas, each of which are considered important and able to influence the success of a professional group. Four groups were considered, due to the fact that each group now has a presence or power base in the Ambulance Service and pre-hospital care as identified in Table 19.

Table 19: Comparison areas between professional groups.

	Paramedic	Medical	Nursing	New Practitioners
Numbers of staff in practice with Pre-hospital Care/Ambulance Service	✓	✓	X	✓
Evidence base for each professional group	✓	✓	X	X
Policy position	✓	X	X	✓
Professional Body view	✓	✓	X	X

Table 19 shows the areas that were compared in relation to each professional group. In the event, it transpired that not all areas could be fully assessed due to limitations with the availability of appropriate data.

Some measures, for example numbers of people employed, are a direct quantitative measurement of the penetration of a particular working group, and this could be easily represented and built into the analysis. Numbers within each professional group working in the pre-hospital role were believed to be a very clear representation of the success or otherwise of the groups in the study and were accessible from the NHS Electronic Staff Record via the NHS Data Workhouse. In some cases this data was not available and it was necessary to conduct telephone surveys. Further literature searches were undertaken during this period.

Equally, if there was a specific DH policy guidance regarding a particular workforce option this would represent a strong signal and while there was a little more subjectivity in this area the approach was transparent. To facilitate the development of the data into quantitative formats the initial plan was to grade non-directly quantitative data [non-workforce numbers]. A weighting was added, with each data point or 'signal' being considered or categorised as very weak 1, weak 2, moderate 3, strong 4, and very strong 5. Once the grading of the non-quantitative data, which by definition will have an element of subjectivity [hopefully reduced to a minimum] was concluded, four statistical process control charts, one for each of the groups, was generated in an attempt to establish trends over the last 10 years (these were later changed to a more conventional graphic arrangement). However, this

approach was subsequently replaced by more conventional Microsoft Excel based histograms with trend lines. This produced a series of visual representations regarding the relative health or strength and hopefully trajectory of a given workforce group.

There is no universally accepted format for the collation of the horizon scans and EuroScan only makes general comments on the subject ‘an assessment of likely impact in terms of health and financial impact.’ However, the following analysis is divided into sections and adopts a style that closely emulates that which is used in the UK and Australasia (Australian and New Zealand Horizon Scanning Network). Mundy et al (2005) describe horizon scans as a ‘state of play’ [technology] assessment based on available information, which is not intended to be the last word on the subject. The following elements form the main body of the horizon scanning section.

- Executive Summary
- Context in which UK ambulance services and paramedics operate
- Target Group (i.e. the group of patients the technology (workforce options) are designed to serve)
- A description of the technologies and their intended purpose
- Innovation and advantage [of paramedics]
- Stage of development
- Relevant guidance (NICE etc)

- Relationship with NHS priority areas
- Clinical need and the burden of disease
- Place of use
- Developers
- Efficacy and safety
- Existing comparators
- Cost analysis
- Limitation of assessment
- Conclusion

Parker and Alexander (2005) have described some limitations with the method, which is regarded as inevitably being based to some degree on an 'unsystematic' summary of potentially 'incomplete' data, especially if assessment is being conducted at an early stage in a product's lifecycle. In this case the paramedic 'product' is still evolving, which the other competitor workforce options are still 'adapting' to their role. A further, even more cautionary note is sounded by Montori, Wilczynski, Morgan and Haynes (2003) in that it cannot only be methodologically inexact, but may also reflect the 'bias of the author.' Horizon scanning, in the minds of some is, at its least edifying, as Popay et al (2005) suggests a 'narrative review,' although they appear to accept that a well conducted systematic approach, particularly in regard to the conduct of 'search and appraisal' strategies, can help enhance the quality of the final output of the Horizon Scanning process.

As with all research, the quality can be, to some extent, defined as ‘the extent to which all aspects of a study’s design and conduct can be shown to protect against systematic bias, no-systematic bias and inferential error,’ is largely a function of the strength of the inputs, such as the grades of evidence available to appraise in combination with an open and enquiring mind.

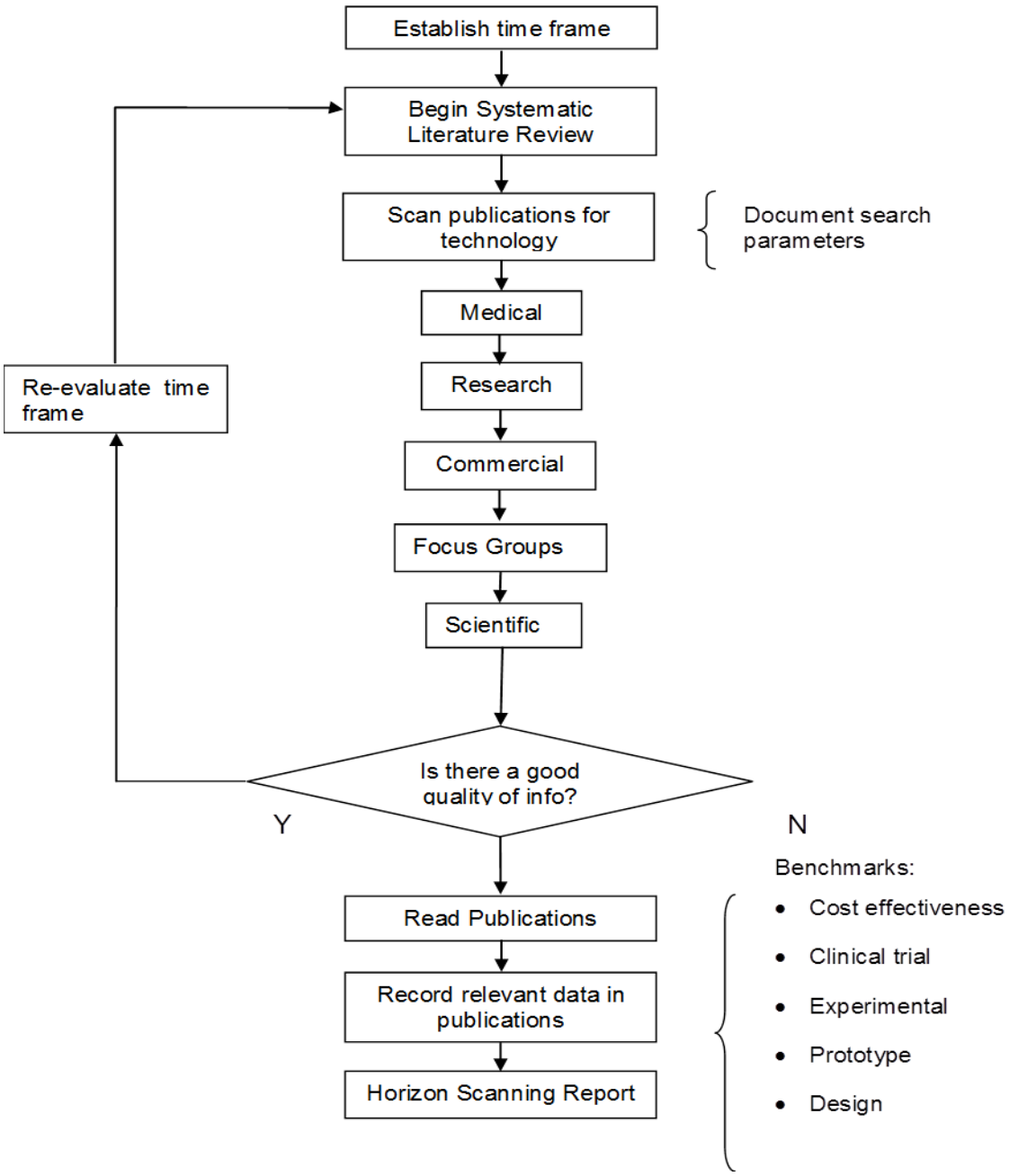

Figure 84: Adapted from Brown et al, 'The methodology for Horizon-Scanning'

Figure 84 shows an indicative process for undertaking Horizon Scanning.

VIII.2/ Summary

The motivation and research rationale for adopting a phase 'B' section to this study has been widely addressed in Chapter I and subsequently, the approach appeared to offer at least some opportunity to help understand the shifting environmental context and to anticipate the effect of these changes. Horizon scanning is increasingly used as a tool by those involved in planning and public health, the first logical step was therefore to determine the wider context in terms of both population growth, together with the organisation contact, for example the numbers of Ambulance Organisations and the demand in respect of growth in request for service via the 999 system. This revealed a marked growth in call volume, the composition of which could be divided into clinical categories, through the use of triage systems. It was considered that all of the above factors would be material to the integrated discussion section.

The second and more focused level of enquiry related to the specific issues of how to employ horizon scanning to attempt to answer questions related to the impact of other professions seeking to occupy the same occupational space as paramedics. These groups included the medical and nursing professions and 'new practitioners.' The possibility that ambulance technicians could have represented a further group in effect 'disrupting' the 'disruptive' paramedic profession was considered, but rejected. The reasons for eliminating this option was the national decision to eliminate this grade of staff and the failure to provide any degree of professional regulation, which

would have been necessary if the group were to develop. Horizon scanning, when employed as part of health technology assessment, seeks to elucidate signals and trends and is expected to consider opportunities for health gain with reference to the evidence base, together with economic considerations. It also inevitably leads to the provision of information that can aid any resulting service redesign.

The horizon scanning process builds up a template in the form of a narrative description, itself comprising an established series of sections. These incorporate the context in which the 'product' under consideration is operating within and other factors including the 'target group,' i.e. which patients the product is designed to serve, a description of the purported advantages, stage of development, safety etc. It also considers comparators and this is where the contrasts with the other available professional groups can be considered. The mechanisms by which this was addressed was via both complying with the horizon scanning template approach, but then going a little further to discern specific signals that might give an indication as to the strength or otherwise of uptake of these alternative options. This was achieved by considering four factors for each group; the numbers employed in relevant practice areas, the evidence base for use in the proposed pre-hospital role, the level of policy support from the DH and the profession's professional body perspective.

Chapter IX

Results from Phase B: Horizon Scanning

IX.1/ Horizon Scan: Paramedics, with reference to competing workforce technology options, (Medical, Nursing and New Practitioners)

IX.1.1 Introduction

The following examples examine a range of relevant variables. The opening section explores the context of change, demographically (i.e. population growth), increase in demand for emergency ambulance services, changes in organisational numbers, for example, number of ambulances services and A&E units/emergency departments. This section will then explore the workforce option data before moving into the narrative results from the horizon scanning process which are laid out in a standardised sequence which inevitably involves a somewhat staccato effect given that this involves 17 sub-sections following a particular form.

One of the most obvious trends is the growth in population within England. Indeed the whole of the UK is changing, with population numbers growing more rapidly than many policy makers anticipated. In itself, this can be expended to add pressure for health services, including those provided by the Ambulance and other pre-hospital services. It is also well established that the population is ageing and as it does so demand for health care, again, increases. The DH Horizon Scanning unit has devoted a large part of its 1997 report, pages 4-7 explaining these trends, with the ultimate conclusion that while overall population is showing some improvements, nothwithstanding obesity, health needs in the over 85 group, in particular, is likely to expand rapidly.

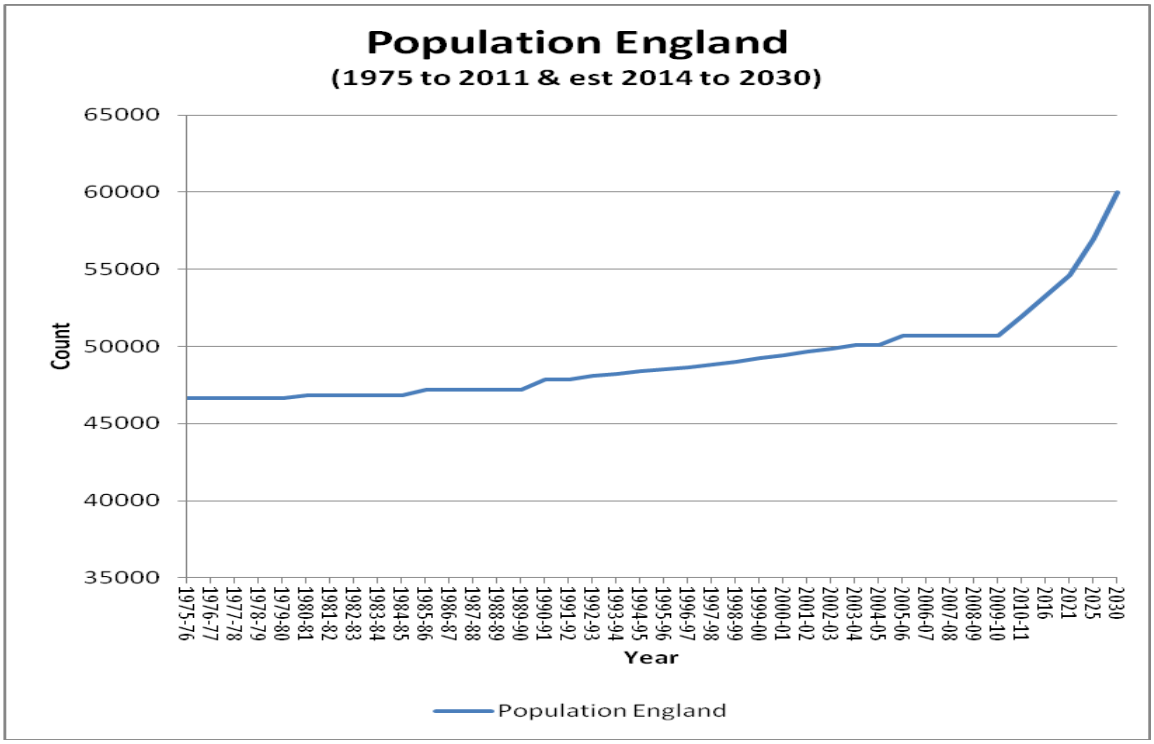

Figure 85: Population of England from 1975.

The population of England is increasing as illustrated in Figure 85, and factors such as an ageing population are known to impact significantly on the demand for health care generally and ambulance services specifically.

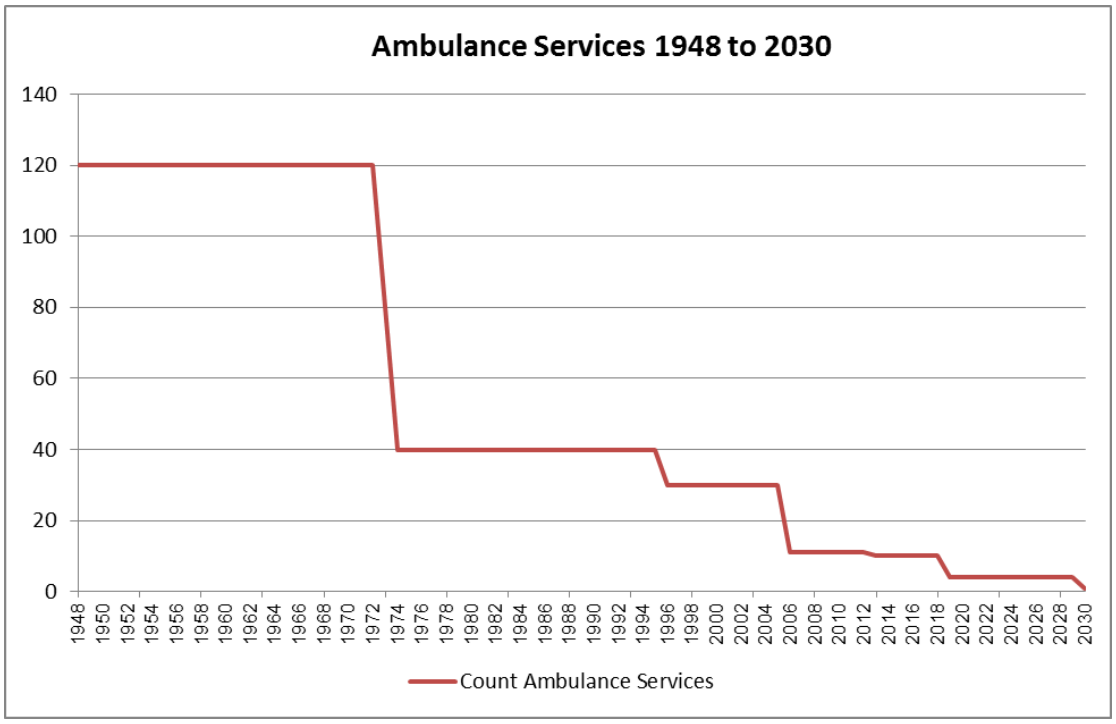

Figure 86: Ambulance Services 1948 to 2030.

The number of Ambulance Services in England has reduced to 10 (see Figure 86) regional services, plus the Isle of Wight, which is a sub-unit of the local hospital. Each of the other countries within the United Kingdom has 1 service, as does the province of Northern Ireland. There is uncertainty as to future organisational arrangements, but the dominant theme over the last 50 years has been a progressive reduction in the number of ambulance services.

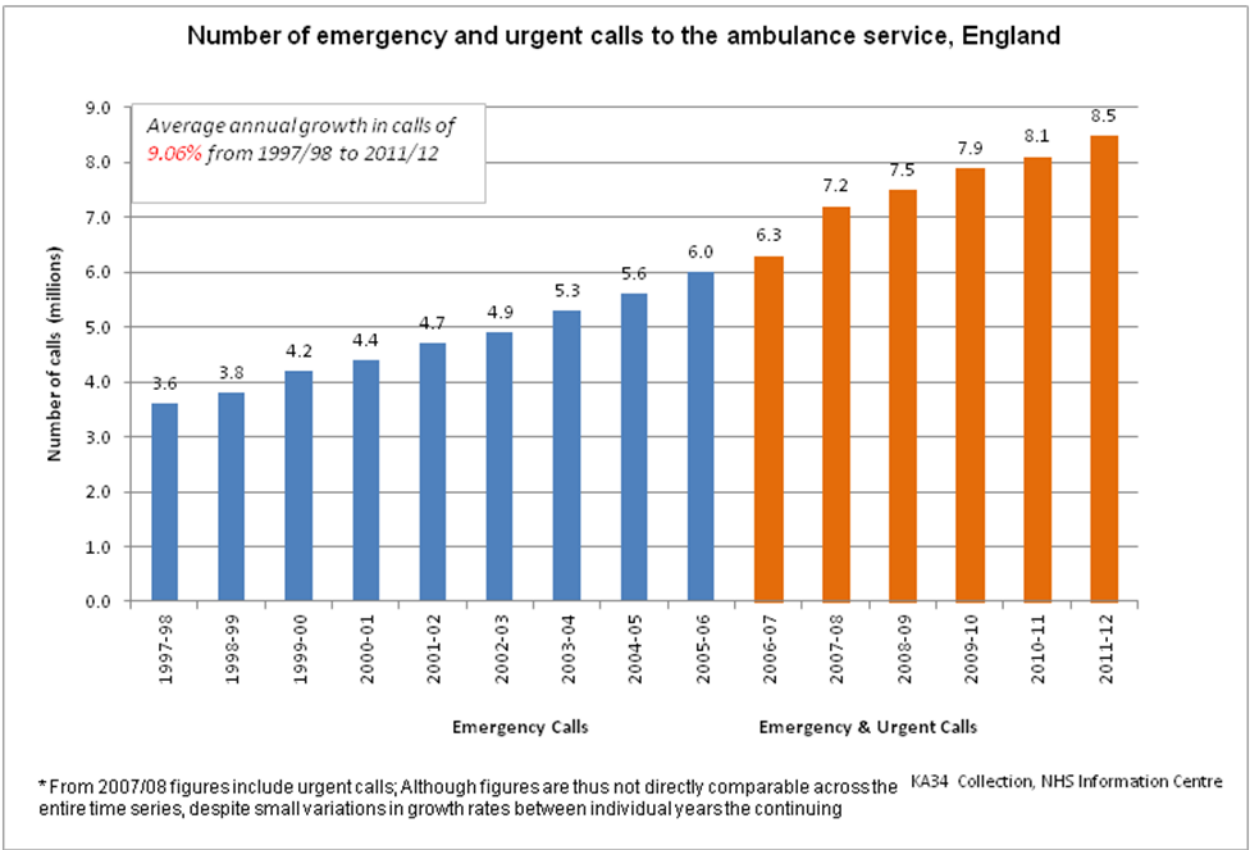

Figure 87: Number of emergency and urgent calls to the ambulance service.

The number of emergency and urgent calls has shown a continuous and rapid increase during the last 20 years as demonstrated in Figure 87 and many factors that account for this rapid rise are discussed in this text, including, social, population growth, technology (increasing availability of communications, such as mobile phones) an ageing population and other reasons.

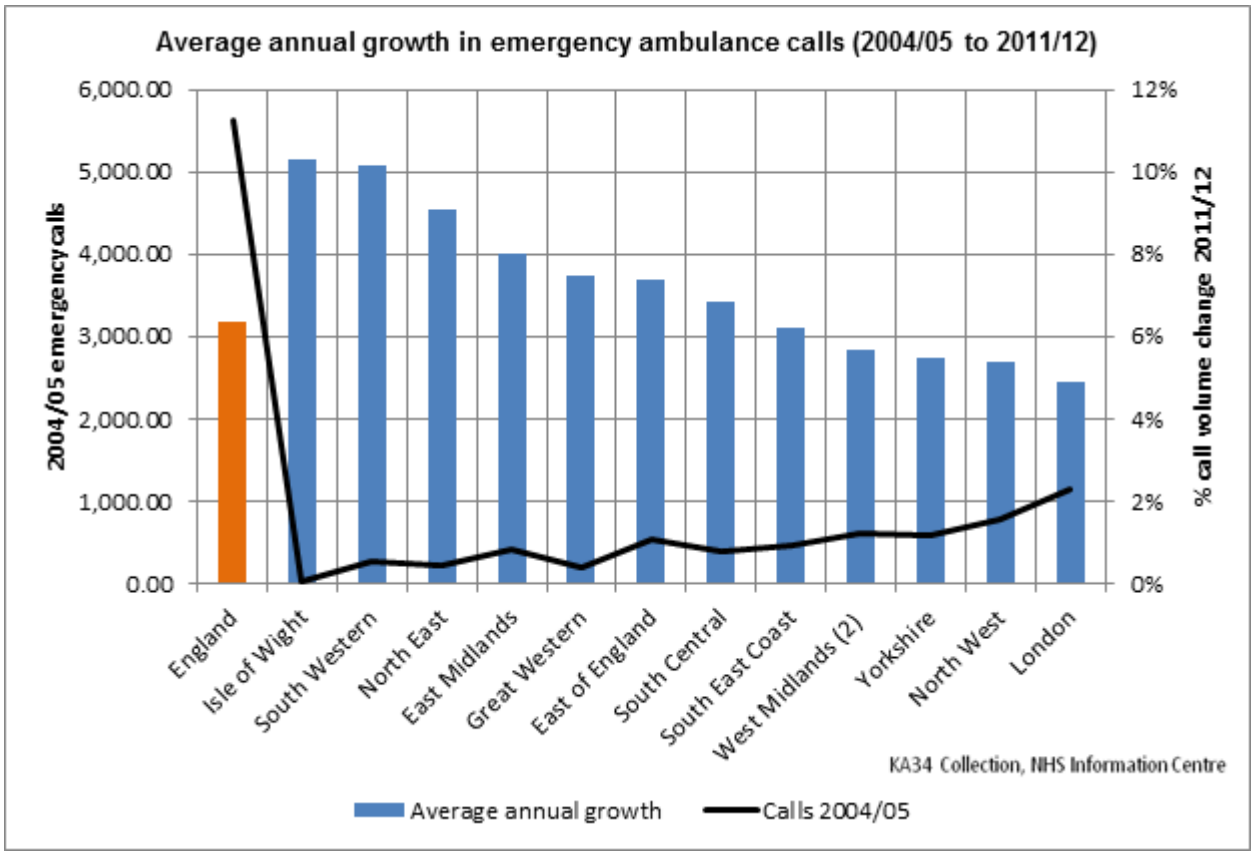

Figure 88: Average annual growth in emergency ambulance calls

All ambulance services have experienced a rapid growth in demand, but with some variation between Trusts (figure 88). There has also been a shift from 'urgent' journeys to 999 calls, as GPs reduce the number of home visits.

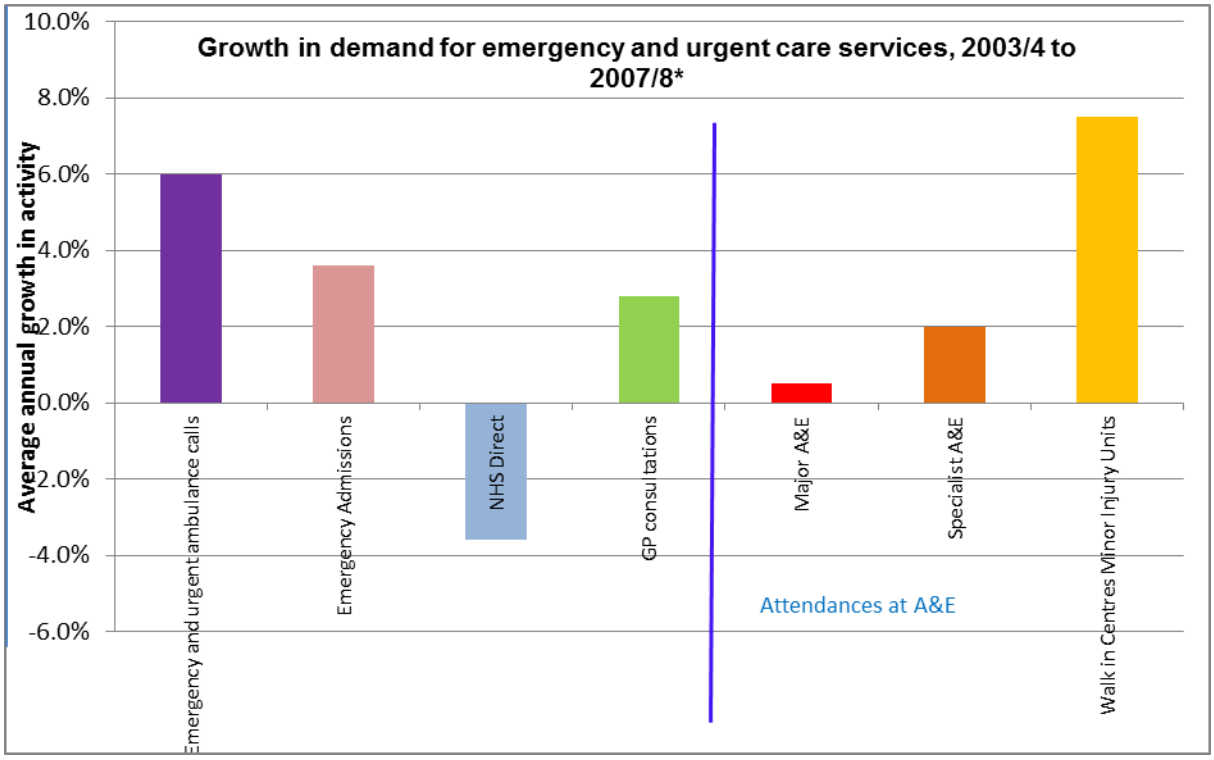

Figure 89: Growth in demand for emergency and urgent care services.

During the last 15 years a wider array of urgent care health facilities have become available, such as 'Walk-in centres and venues other than A&E, are now frequently renamed as 'Emergency Departments' following the American nomenclature. Patterns of usage of a variety of different health care facilities are illustrated in Figure 89. Current commissioning intentions increasingly emphasise the role of these units, in an attempt to divert away activity from the 'Emergency Departments' in an effort to relieve pressure and reduce admissions, although the latter objective represents a 'high bar' and is difficult to achieve without an effective diagnostic capability. Demand for NHS Direct services has fallen and the service has largely been decommissioned and replaced by the new '111' telephone advice and 'urgent care co-ordination telephone service, some of which are being operated by ambulance services.

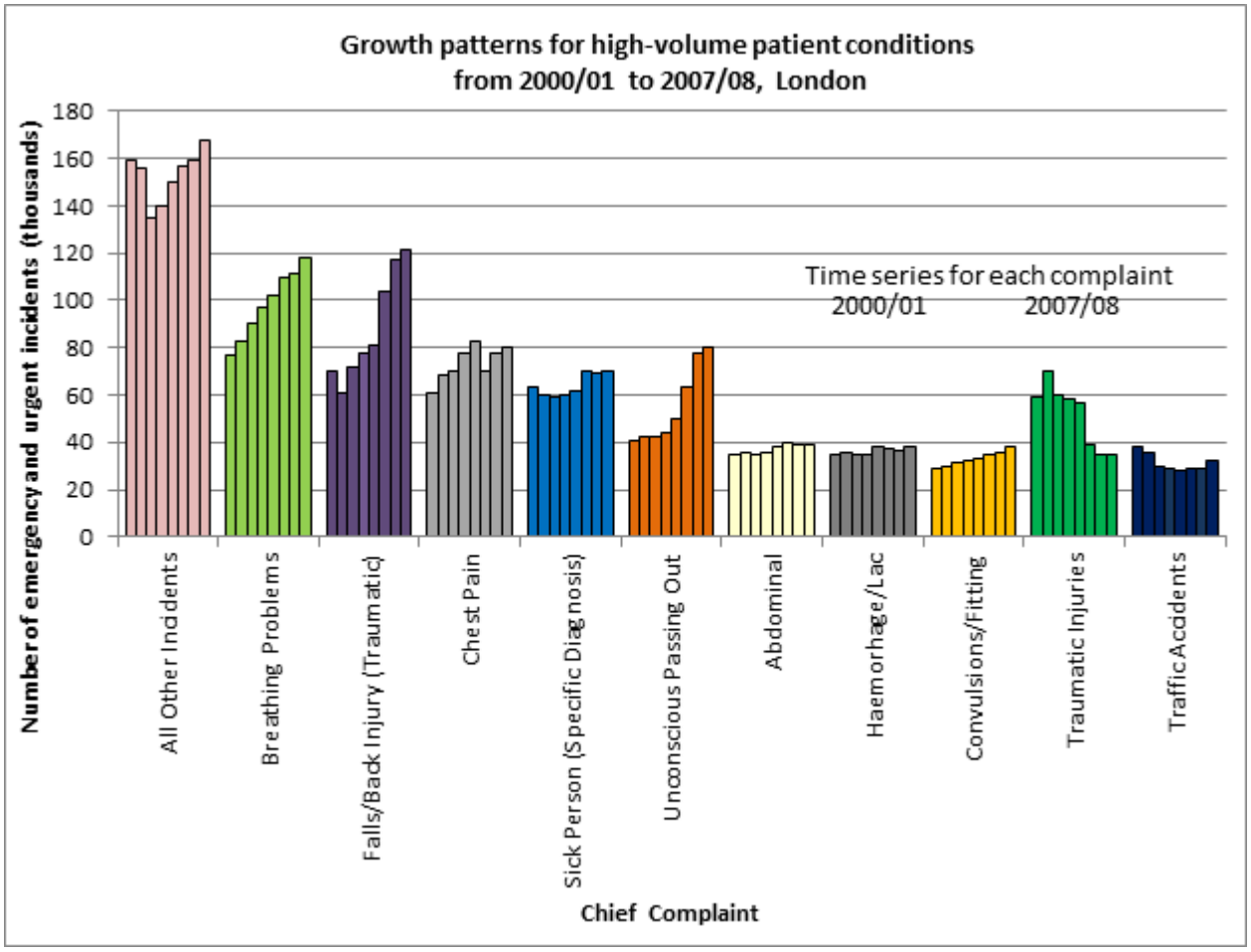

Figure 90: Growth patterns for large-volume patient conditions

Certain categories of call appear to be increasing across the UK (Figure 90), with breathing difficulties, falls and chest pain strongly represented and reflecting the aging nature of the communities served.

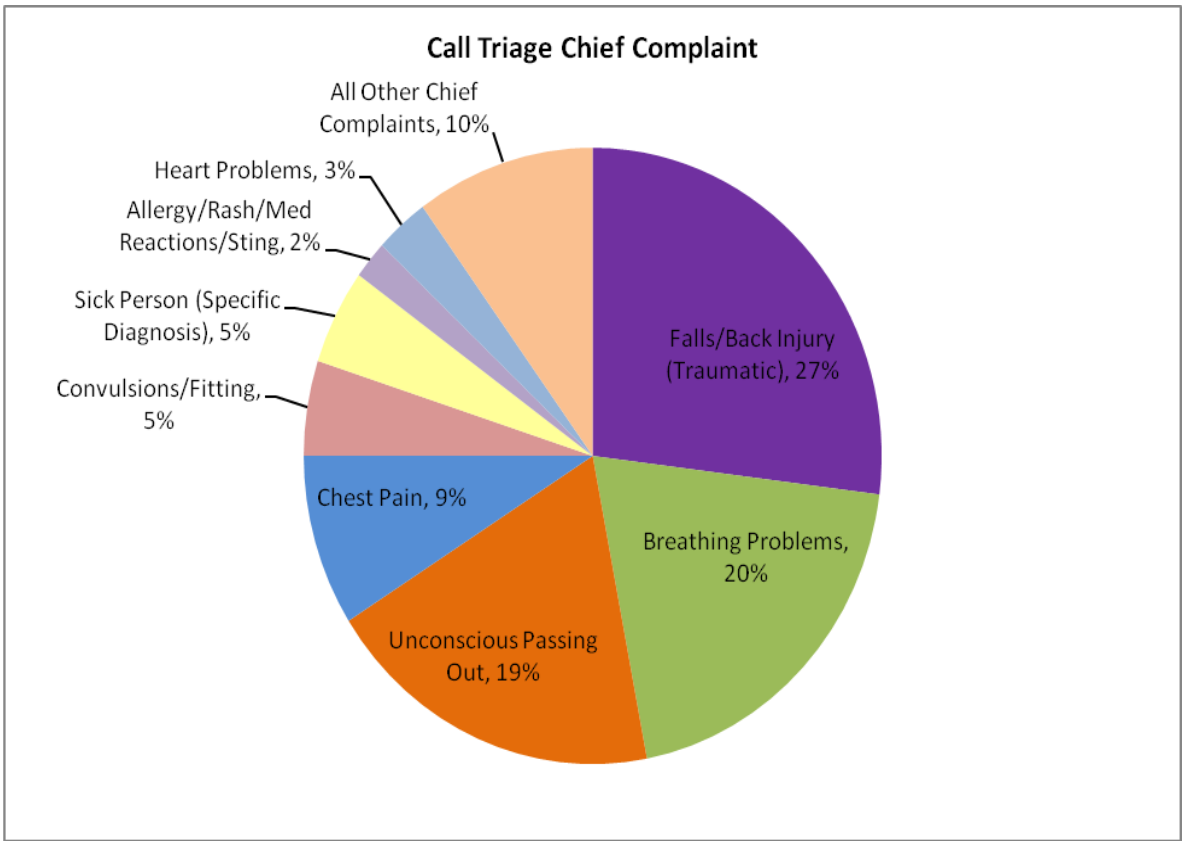

Figure 91: Chief complaint pie chart.

Triage systems are now a well-established feature of the ambulance service and permit a level of assessment of patient need at the control level that was previously impossible. Figure 91 reflects the breakdown of a one hundred per cent sample of emergency 999 calls. In addition to determining the chief complaint the clinical priority is also determined, although both of the two systems in use, the AMPDS and the NHSP systems 'over' triage the number of patients, classifying approximately 30 and 40 per cent of cases as 'life-threatening.' Once qualified responders are at scene the percentage of patient considered to have immediately life-threatening conditions falls to something in the order of 5-10 per cent. However, even with a substantial over triage rate it is increasingly possible to establish what type resource,

be it an advanced life support capable unit ,or a basic life support unit that is required.

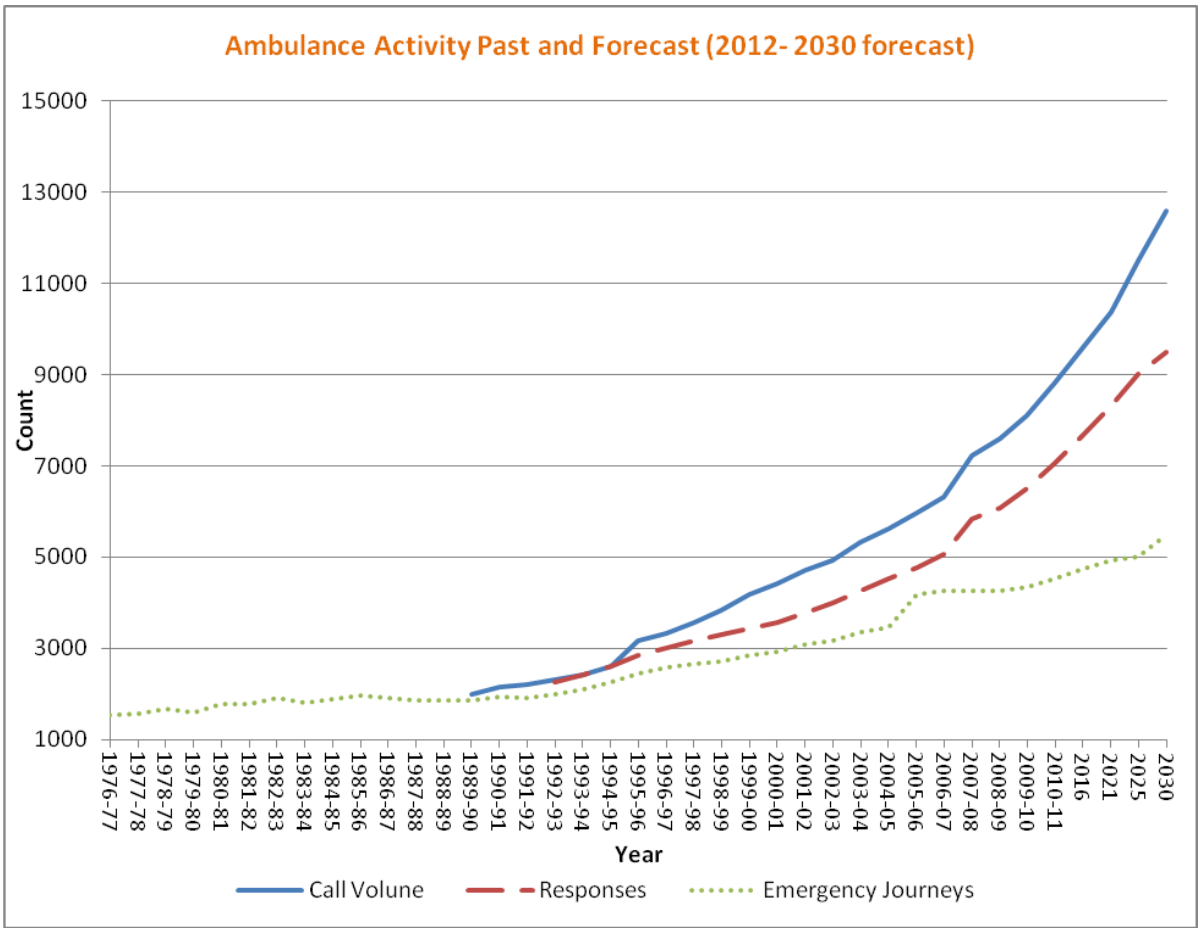

Figure 92: KA 34 Derived data.

The Department of Health's annual 'KA 34'. return publishes data reporting the number of emergency 999 calls, 'activations' or 'responses,' and 'emergency journeys or calls that result in transport.

Figure 92 demonstrates a continued increase in emergency call volume growth during the decade. Some Trusts are reporting a slowdown in growth during 2011 [SECamb growth has continued at the level of a 5% increase]. This is of considerable importance to the discussion, given that, as widely recognised,

approximately 90% of these cases are not true life-threatening emergencies. If this demand is transmitted into the wider health care system the potential impact in terms of an increase in health costs would be very substantial. If however, Ambulance Service and paramedics were able to deal with a proportion of this demand, through better assessment, treatment and 'alternative pathways', such as community care options overall NHS costs, conveyance and hospital admission rates would be reduced.

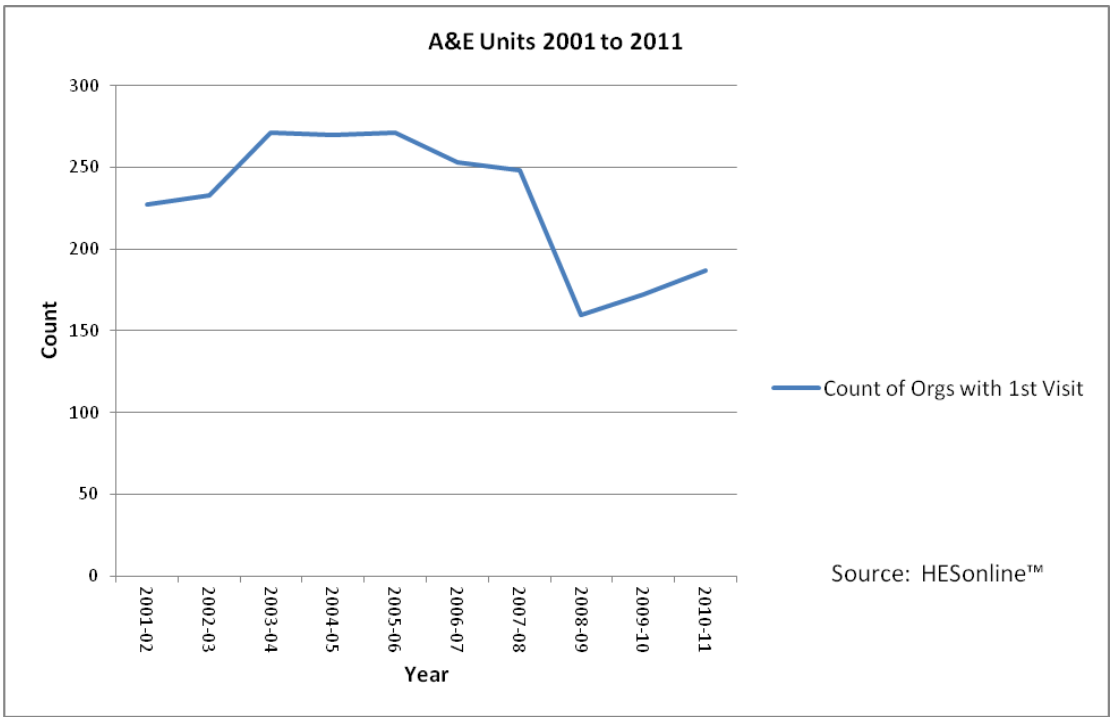

Figure 93: A&E Units.

The number of A&E or 'Emergency' Departments has fallen due to consolidations, mergers and downgrading since 2001, although as cited previously the number of less capable urgent care oriented units, such as Walk in Centres has increased. The reduction in units has taken place at a time when a number of specialist centres have been established to deal with the specific definitive care needs of patients

suffering from myocardial infarction (MI), stroke and trauma. This trend is likely to continue and it is likely to be accompanied by a gradual stratification and specialisation of pre-hospital services. (Figure 93)

Figure 94: Number of A&E Consultants

While the number of Emergency Units has reduced the number of Emergency Department specialists has increased and continues to do so. The representative body for these staff, the College of Emergency Medicine, continues to lobby for a further rapid increase in numbers and also promotes the role of Emergency Department Consultants in pre-hospital care.

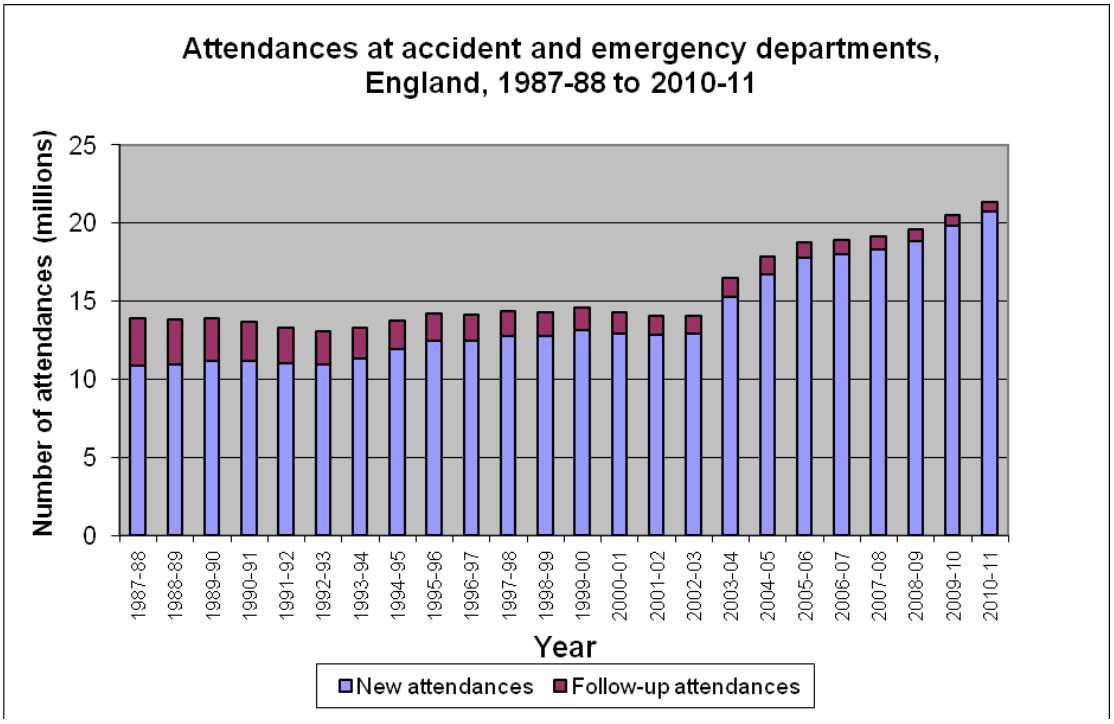

Figure 95: Attendance at A&E Departments.

Figure 95 is courtesy of the DOH website at the link:

http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/@sta/@perf/documents/digitalasset/dh_126708.xls

Emergency Department attendances continue to increase despite the proliferation of alternate facilities. However, figure 95 demonstrates relatively few of these attendances are converted into actual admissions. Commissioning intentions increasingly concentrate on reducing admissions and the paramedic/ambulance service role in achieving this is moving centre stage.

IX.1.2 Data by Profession Workforce Numbers

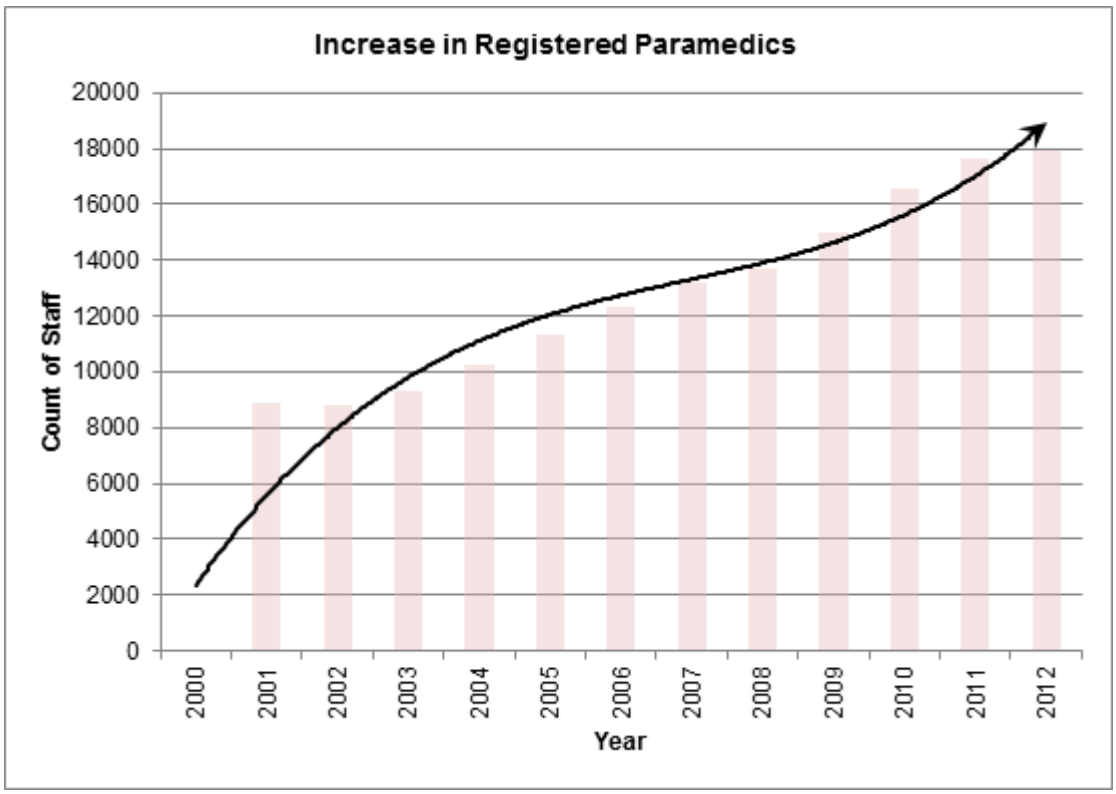

Figure 96: Increase in Registered Paramedics.

Figure 96 illustrates that the number of registered paramedics has increased rapidly since the advent of paramedic registration in November 2000. At that time approximately 7,500 were admitted to the register with further numbers being added over the following two years, in particular, due to the 'grandfathering' process. Grandfathering, enabled those claiming to have paramedic skills, but who were generally outside of the NHS or who had non-standard training to make a claim for registration, many of which were approved. In the last decade, since grandfathering closed, the numbers of paramedics have increased rapidly since more training and education schemes have become available, particularly within the higher education sector. The biggest reason for the increase is, however, the continued rapid rise for

NHS and other ambulance services due to the growth in demand via the 999 system. It is also true that many more opportunities exist for paramedics to work in the wider health care environment and in other areas such as primary care, search and rescue, the offshore and remote setting and the military. All of these numbers are relatively small in comparison with the numbers employed within the NHS, but are increasing rapidly.

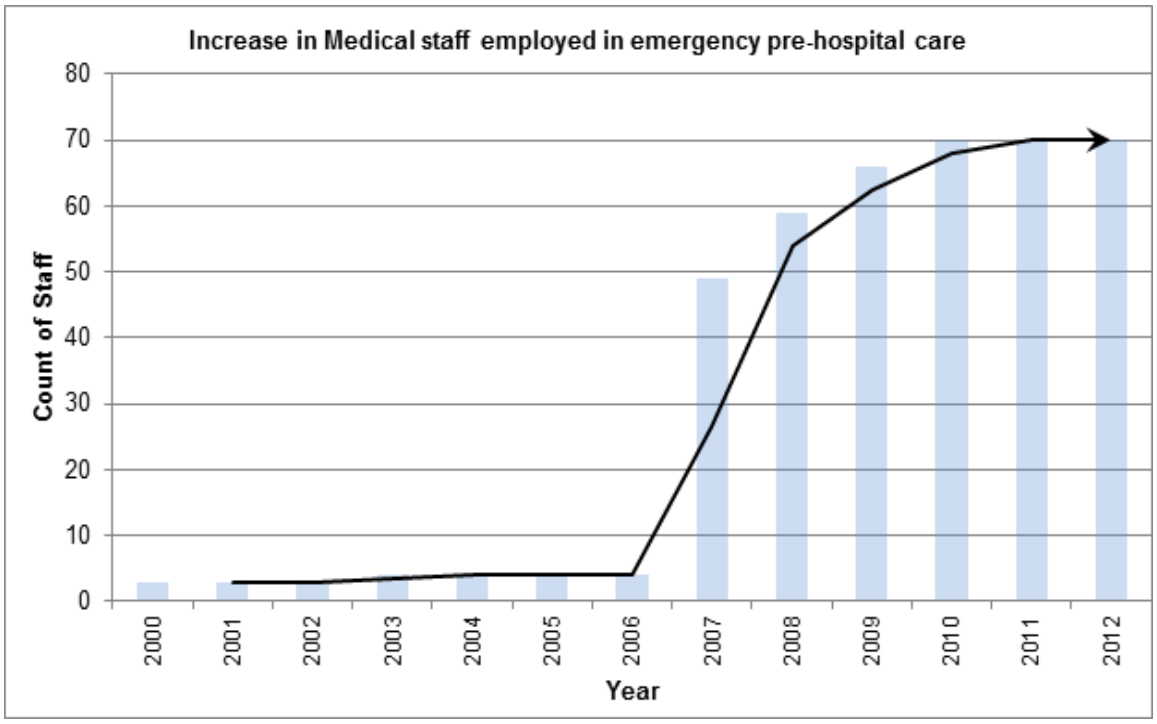

Figure 97: Increase in Medical Staff employed in Emergency Pre-hospital Care.

From a zero start position 20 years ago the number of paid medical staff operating in either directly funded/commissioned NHS appointments or in quasi-appointments, i.e. funded or part-funded by medical charities has escalated dramatically, although overall the number remains small (Figure 97). The advent of Deanery approved training places from summer 2012 will increase the flow of doctors with training in pre-hospital care, but it is unclear what mechanism will be used to actually fund on-

going involvement with the speciality. MIERT units are becoming more common, but there is no standardised approach as to how these services might be provided on a more national basis.

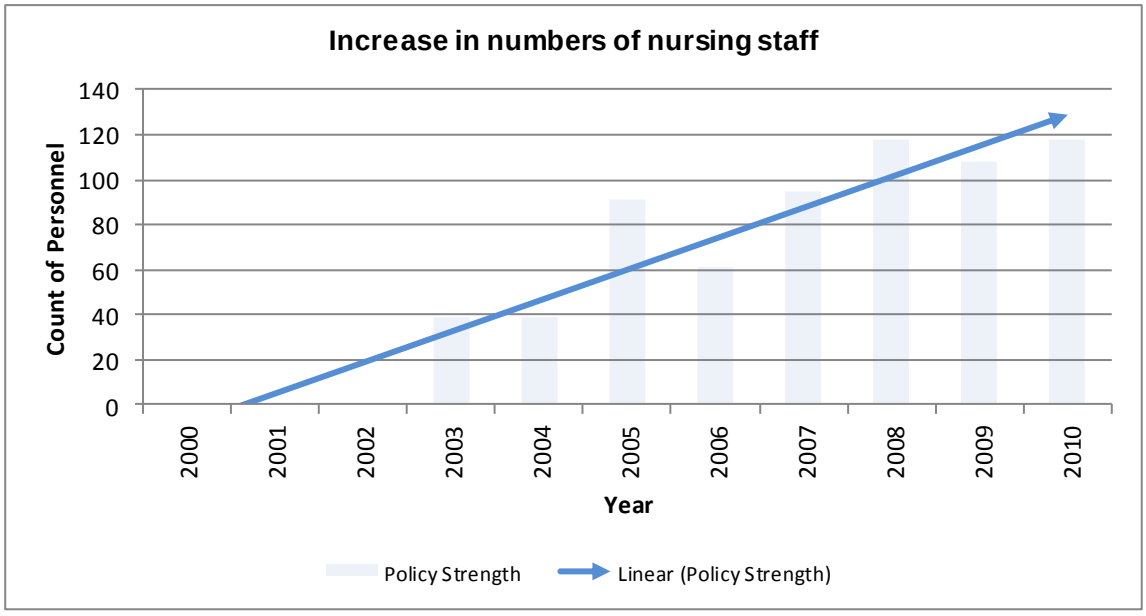

Figure 98: Increase in numbers of nursing staff.

Figure 98 shows the data on nursing numbers within ambulance trusts was more difficult to obtain as described in the Methodology section. The telephone survey of ambulance trusts in England revealed that most trusts had very small numbers of nurses, often limited to operating in managerial roles, typically clinical audit.

Foundation Trusts are required to have a nurse on the Trust's board. One Trust had taken the step of employing what was termed 'ambulance nurses', operating at level 5 of the career structure with a job description almost identical to that of a paramedic. There was also some confusion regarding nurses operating in a 'new practitioner' role. The apparent increase over the last few years now appears to be

levelling off. Numbers of nurses in this role were always much lower than paramedics. The fact that numbers now seem to be decreasing is likely to be related to the reduction in the number of 'new practitioner courses'

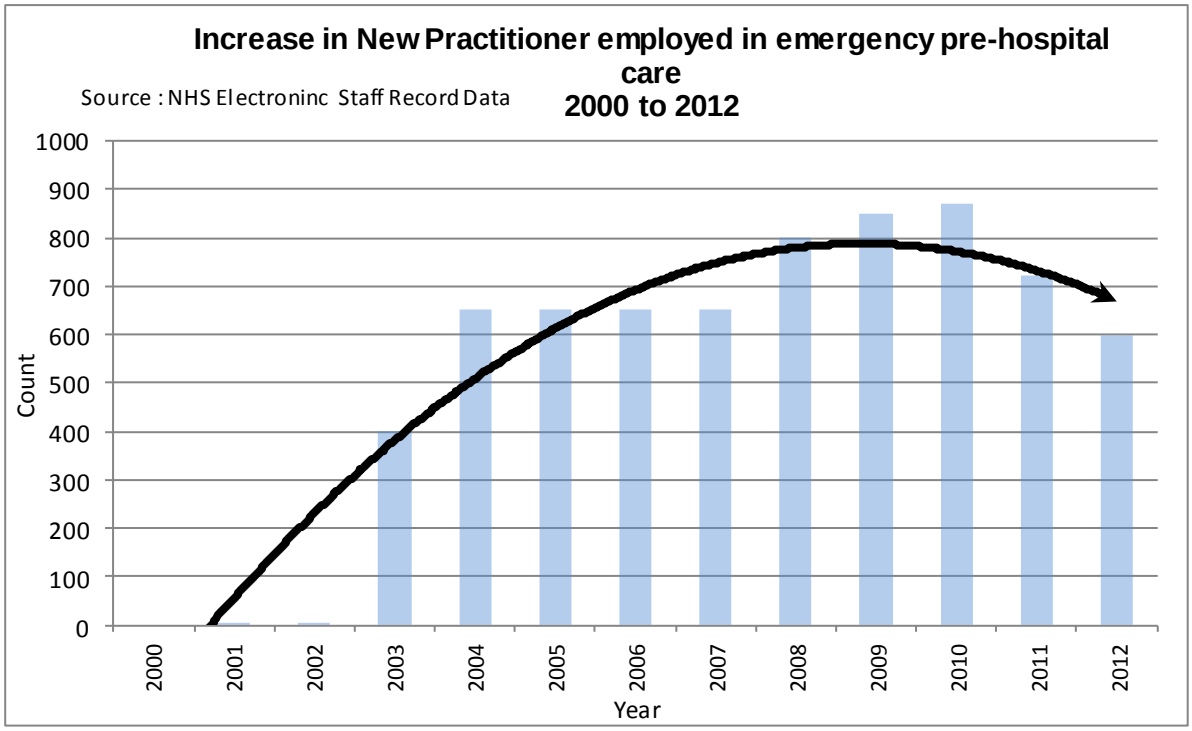

Figure 99: Increase in New Practitioner employed in emergency pre-hospital care 2000 to 2012

New practitioner numbers increased rapidly during the former labour government as part of their initiative to develop this grade of staff. However, as with the previous noted there is a degree of confusion over what precisely a new practitioner is, as discussed in the narrative within this chapter and later in the discussion. Data for new practitioners is derived directly from the NHS data warehouse and numbers have certainly fallen since the new alliance government (Figure 99). This may be partly a function of staff involved in these roles reverting to their registered titles (paramedic or nurse), together with the fact that such schemes have now greatly

reduced in number. An example of the type of schemes available is discussed briefly in Appendix IV.

IX.1.3 Evidence Base by Profession

The evidence base for each of the individual professional groups is a key consideration and has been a source of some controversy, it is also well recognised to be both incomplete and sometime difficult to compare, given the variation across international systems. These are areas that are discussed further within the narrative section of this results section and more extensively within the discussion chapter. In terms of general approach, studies were sought that could demonstrate the strongest class of evidence, randomised controlled trials being the optimal. However, few such studies exist, although the Bernard et al's RCT, published in 2010 is a notable exception. In almost all other cases lower tiers of evidence were considered and graded accordingly, ranging from 5 points for an RCT down through the ranks of evidence.

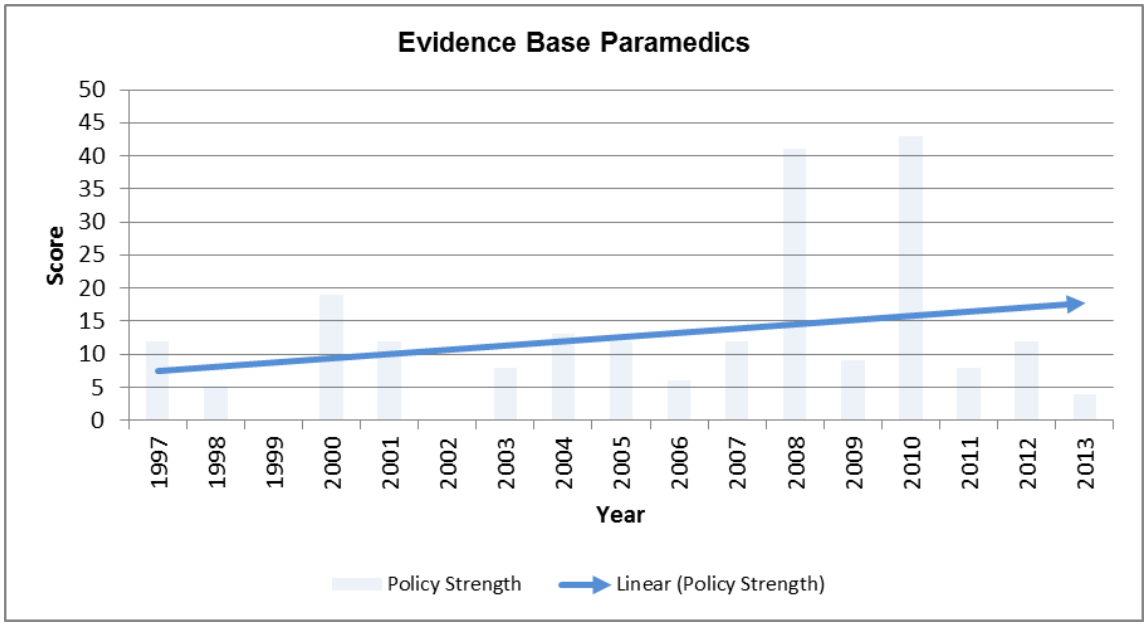

Figure 100: Evidence Base Paramedics

The evidence base of paramedics is discussed extensively in the discussion section.

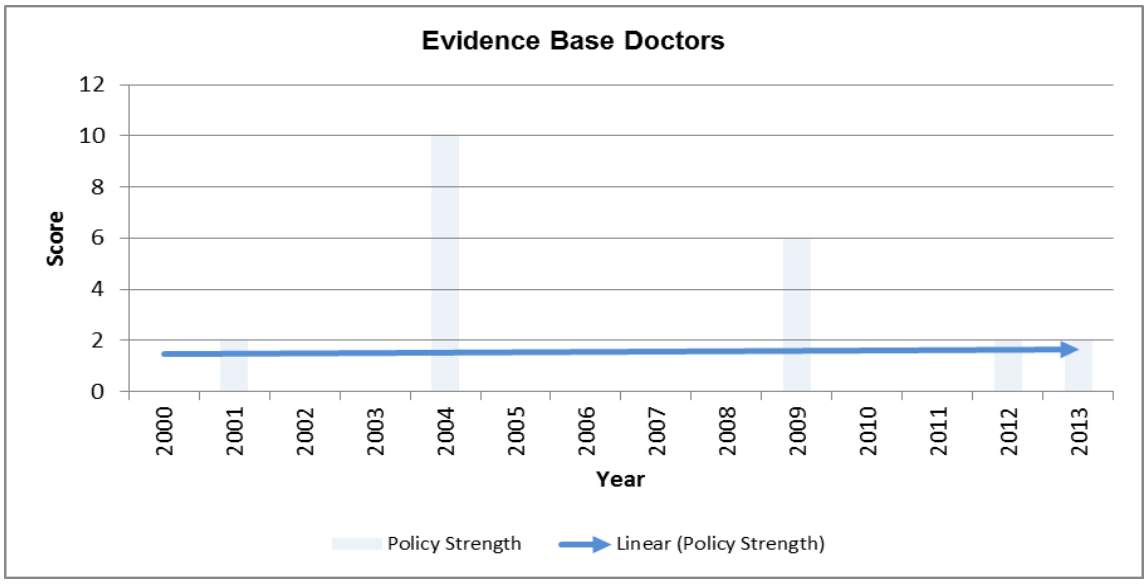

Figure 101: Evidence Base Doctors

Figure 101 shows the evidence base for the use of doctors in a pre-hospital setting is another area which receives close attention within the discussion section. As with paramedics, the area remains complex and while a number of authorities have

sought to reach a definitive view as to the application of medical staff pre-hospitally, the area remains controversial.

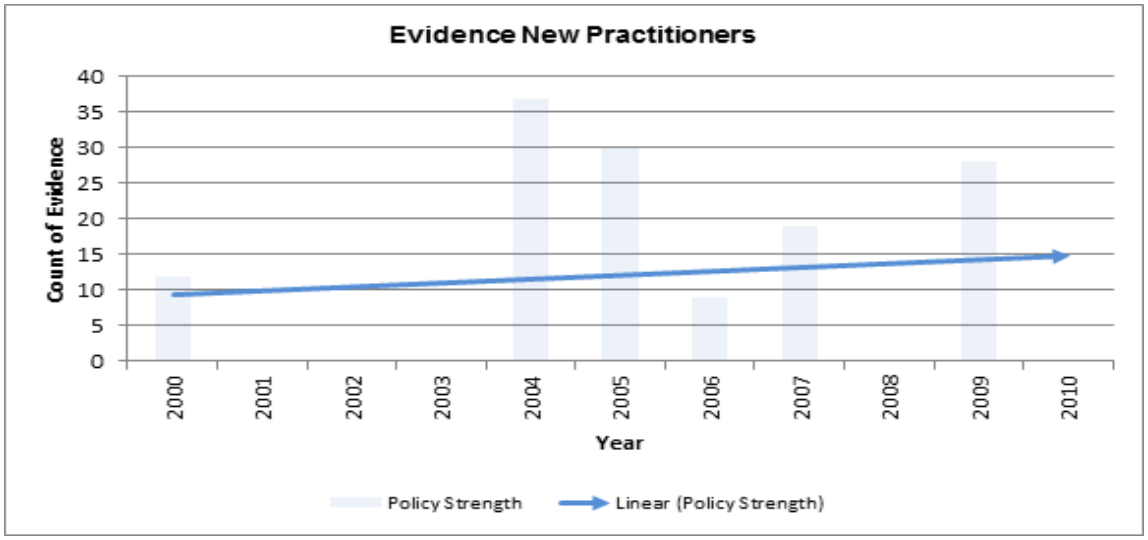

Figure 102: Evidence Base New Practitioners.

Figure 102 indicates that, with the reduction in central interest in new practitioners, the number of studies examining the heath impact has reduced. However, the spurt of activity nine years ago did provide some evidence as to the acceptability and impact of Emergency Care Practitioners (ECPs) the shortcomings of which are considered in Appendix IV and other similar schemes involving paramedic practitioners are also considered for comparison. Nomenclature complicates this area, as previously noted. The situation is now changing as 'new practitioners' seem to be less of a priority for the current political administration and many of those staff operating in these roles appear to be reverting to their primary registered titles.

IX.1.4 Policy Documents

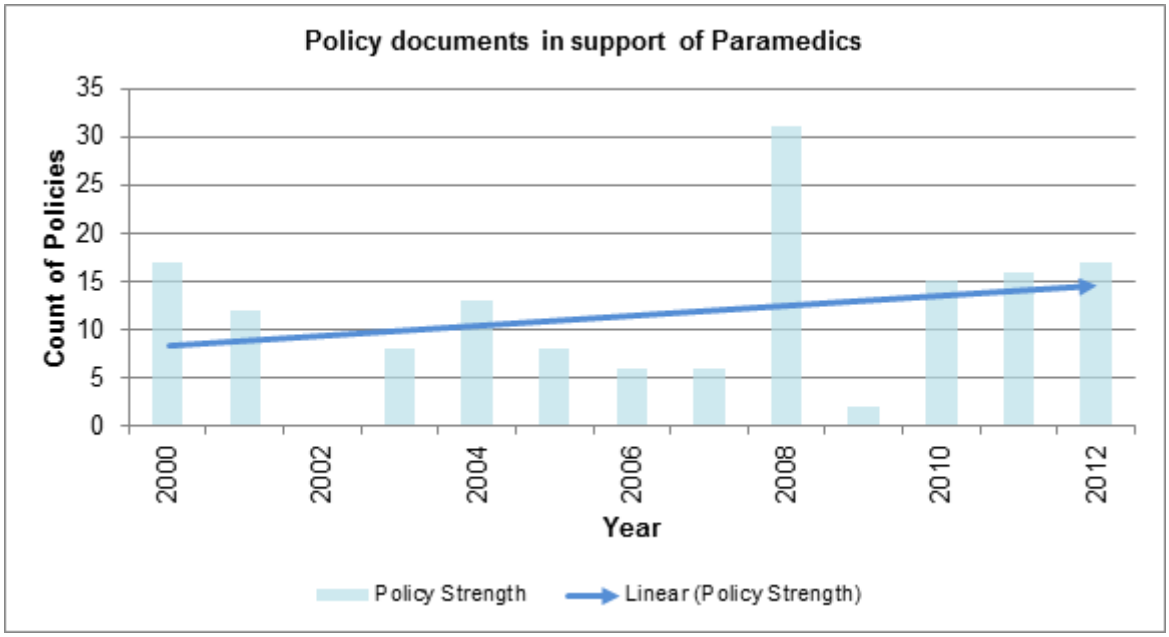

Figure 103: Policy Documents in Support of Paramedics.

There have been a growing number of policy documents that acknowledge and promote the role of the ambulance service and paramedics (Figure 103), often ascribing specific roles to both. An early example of this was the National Service Framework (NSF) initiatives, with the NSF from Coronary Heart Disease (2000) outlining specific targets. Other NSF and policy documents have followed indicating that both the ambulance service and the paramedic profession are moving closer to the centre ground of health policy with clear duties in respect of implementing targets designed to secure health gain, such as early defibrillation, the detection of stroke and the use of specialist referral centres for these serious conditions.

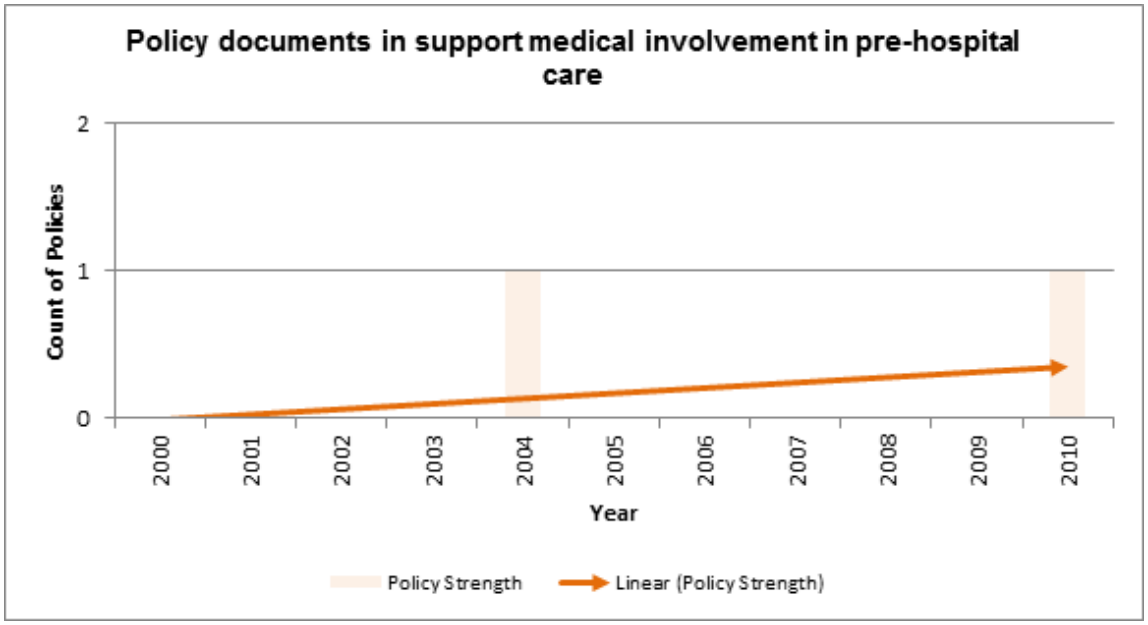

Figure 104: Policy documents in support medical involvement in pre-hospital care.

One of the most surprising findings in this area was that there is virtually a complete absence of policy documents in relation to the use of doctors in a pre-hospital setting (figure 104). It is necessary, therefore, to conclude that there is effectively no policy intention in this area despite intense lobbying and interest from those within certain sections of the medical community. However, there is one notable exception in relation to the management and staffing of 'major incidents' that are typically characterised as large-scale multi casualty occurrences. National guidance supports the role of doctors as direct care providers in this situation, but conversely the evidence base contains very little, if any, support for these activities and remains equivocal, as considered further in the discussions section.

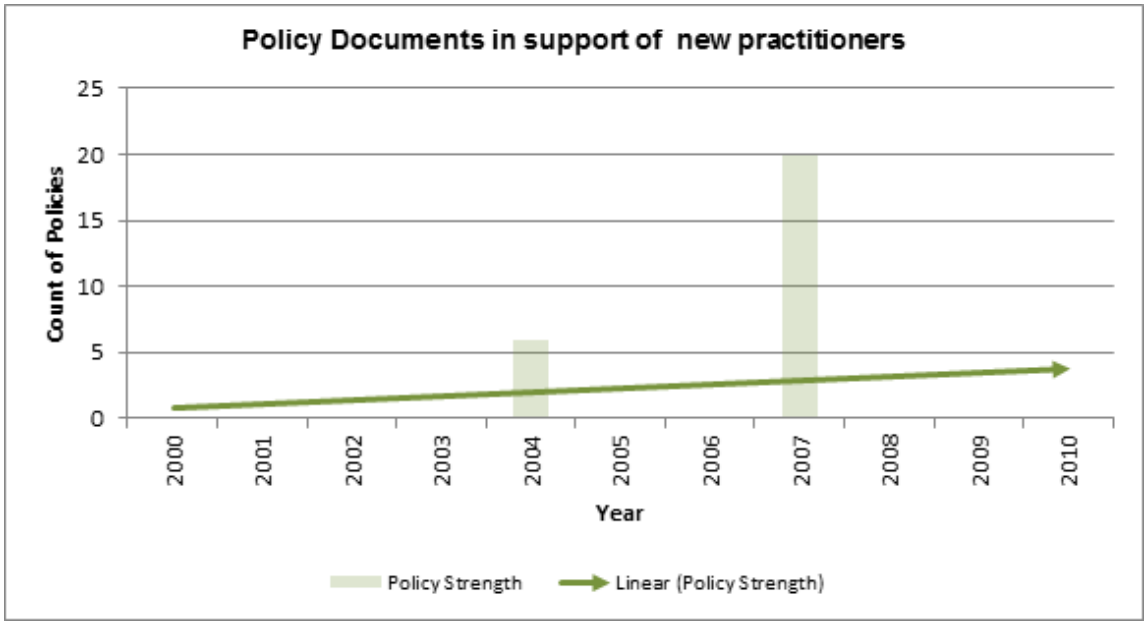

Figure 105: Policy Documents in support of new practitioners

As can be seen from figure 105, there were two peaks in relation to policy documents and the use of new practitioners under the last political administration but beyond this no other data of relevance could be found.

In relation to nursing no data could be found relating to the use of nurses in the pre-hospital setting. Hence, no supporting graphical data.

IX.1.5 Professional body, regulatory and other promotional activity

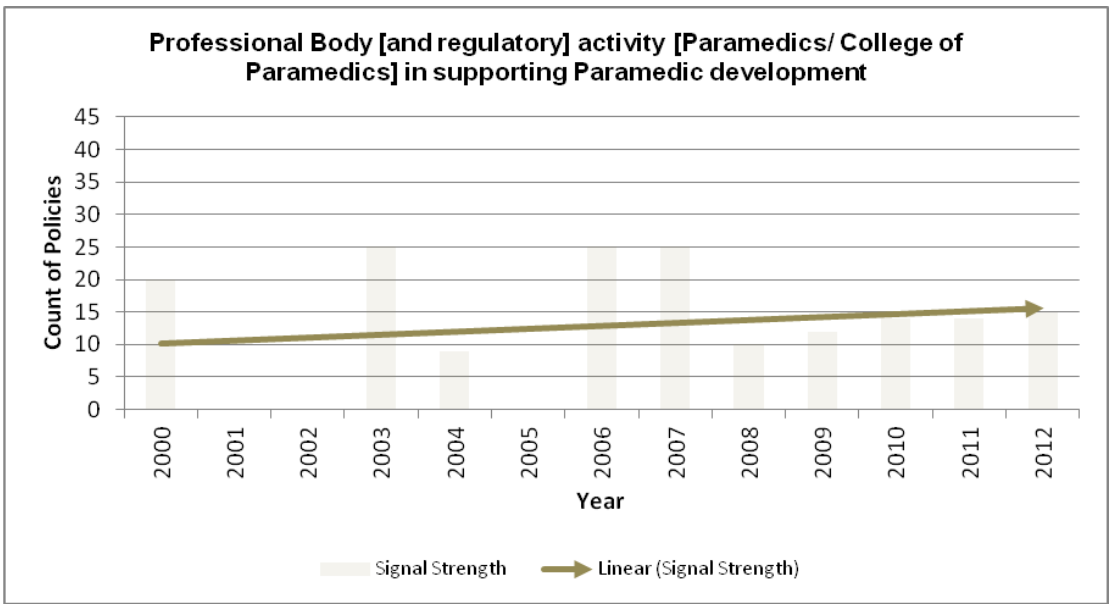

Figure 106: Professional Body (and regulatory) activity in supporting Paramedic Development.

The CoP has grown in membership and thereby strength and influence. It has also taken on a broad range of responsibilities, such as dealing with the regulator in relation to the production of a curriculum framework, the development of a QAA 'Benchmark Statement,' position statements, revisions to the HCPC Paramedic 'Standards of Proficiency' among many others. Supporting post registration training and education is now a priority area that will feature prominently in the 2013 version, currently in the consultation phase [3rd edition] of the curriculum framework and this has direct CoP Council support.

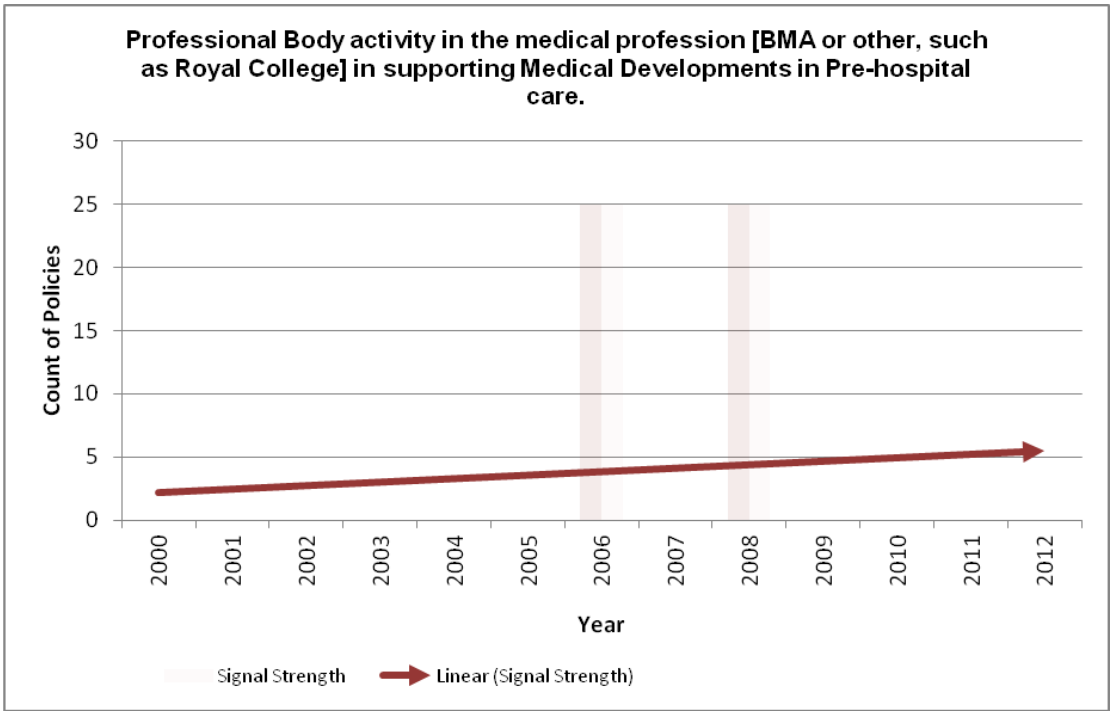

Figure 107: Professional Body Activity in the Medical Profession.

Professional Body activity within the medical profession (Figure 107), such as the British Medical Association (BMA), Royal College and other organisational entities such as the GMC showed relatively low levels of formal action in support of developing a formal role for a medical presence outside the hospital role. This does not mean that there was zero activity in this area, but that which did exist tended to operate within voluntary arrangements. This has changed recently with the upsurge in interest, most notably culminating in the approval by the GMC for a sub-speciality in 'pre-hospital care.'

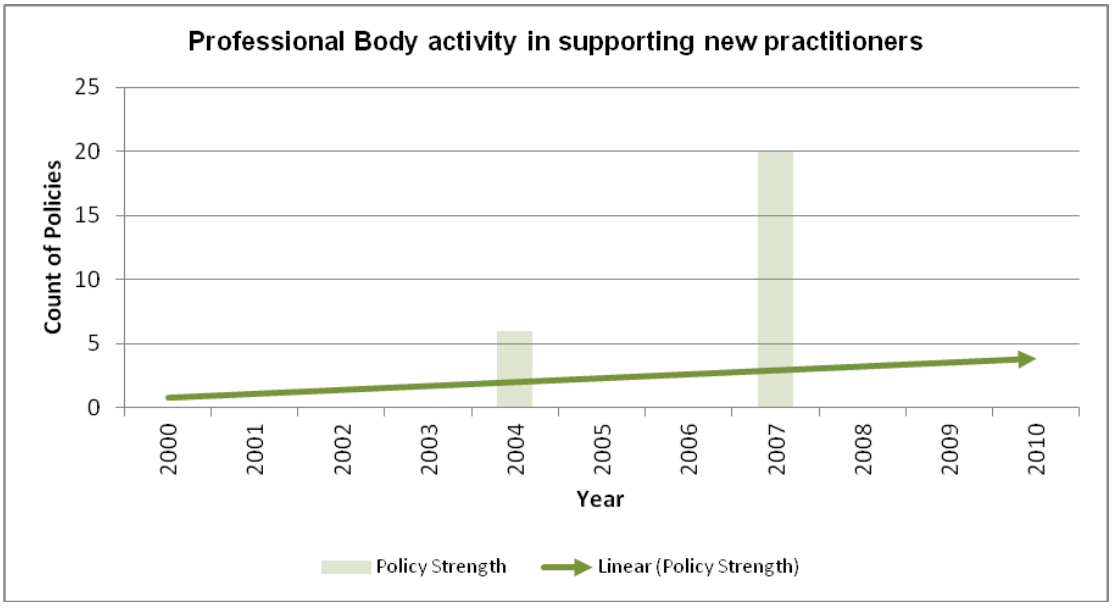

Figure 108: Professional Body Activity in Supporting New Practitioners.

New practitioners were very firmly a priority for the previous Labour government, with the Modernisation Agency (MA) given a lead role in their development a theme articulated by Kendall and Lissaier (2003) a previous special advisor to the Labour Secretary of State for Health and now a Labour MP. Kendall and Lissaier sought to encourage the development of new practitioners partly to address "the dominance of the medical profession" (p.7. *The Future Healthcare Worker*). Today enthusiasm appears to have cooled, with the current Alliance administration, which, while placing emphasis upon a more divergent range of providers, including the 'third', voluntary sector and commercial providers, has been less directive about the creation of new grades of health care personnel.

There have also been some positive efforts to reduce the degree of confusion that surrounded a number of these projects, with *Taking Health Care to the Patient II* (2011) making the position clear. Particularly in respect of title and the conflict that

often existed with primary registration, many of the staff involved were registered paramedics, with a lesser number of nurses and a very small number of other professionals. Greater clarity has coincided with the reduced number of training places, itself a direct consequence of the worsening financial situation. For this reason the Emergency Care Practitioner schemes are now largely relegated. A small number of PA programmes continue. Appendix IV describes the controversy caused by the ECP and the discussion considers the negative implications for the paramedic profession in more detail.

In relation to nursing no relevant data could be found relating to the use of nurses in the pre-hospital setting, hence no graphical data.

IX.2/ Target Group of Scan patients who would be served by Paramedics, who are therefore described as the 'product' or the 'disruptive innovation.'

This Horizon Scan follows the standard accepted format that is used in most published scans. Some of the sections may appear a little 'redundant' in the sense that they may appear unnecessary, but are included for completeness and in order that the conventional approach is followed as far as possible. The 'target group of scan' is the 'product', in this case paramedics themselves, who are explored and described in terms of their 'intended purpose,' their 'innovation' and 'advantage,' with reference to existing policy and with regard to the clinical need they are expected to

meet. In this way they can be more readily compared with other ‘products’, i.e. professionals who might be able to accomplish similar objectives. The discussion chapter will then bring the various options together in the context of the latest information in respect to patient need and evidence as to relative effectiveness.

The ‘target group of patients’ for whom paramedics are primarily designed to serve result from ‘self-presenting’ patients via emergency calls generated in the 999/112 national & EU emergency medical access telephone numbers and originating from either patients’ [first party callers] themselves, their relatives, representatives or members of the general public, (approximately 90% of call volume).

A further group of patients are generated by calls from medical, dental, nursing and AHPs, (approximately 5% of call volume), collectively termed HCPs. A number of patients are generated from other Emergency Authorities such as the Police, Fire & Ambulance (approximately 5%) of call volume, although it should be noted that there may be some overlap and duplication in terms of the reporting agency. Patients generated from the 111 access number present with undifferentiated medical needs classified as not immediately life threatening, large numbers of which are transferred into a 999 system if their acuity is considered sufficient for an emergency response.

Patients located in specific environments, including those in need of UK Helicopter Search and Rescue (SaR) now include a paramedic aircrew member. Patients generated in offshore and remote area settings with health needs who are increasingly attended to by paramedics specialising in this area of paramedic practice.

IX.3/ Description of the technology & Intended Purpose [Paramedics as 'the technology' being described]

Paramedics are one of the AHPs who have attained a level of education and training sufficient for them to gain registration with the HCPC. They are designed primarily for a 'first contact' emergency role and this is therefore their 'intended purpose.' They are independent and largely autonomous practitioners, although this change in their legal status dates only from 2000, which is the point at which they became AHPs.

Prior to this date paramedics were technically 'derivative' practitioners, who derived their authority to practice from their certification, which was issued with the 'approval of the Secretary of State for Health'. In practice, while this is the form of words that was frequently used previously within much of the associated documentation describing paramedic practice prior to 2000, paramedics operated under medical control to a greater or lesser extent. Local Ambulance Trust based training staff, in collaboration with the IHCD managed the process of certification. In addition, each Trust utilised the services of a 'Local Paramedic Steering Committee' (LPSC), to oversee and co-ordinate training quality and placements, as previously described in more detail within earlier sections.

This point is an important one and recognises that, in effect, there are essentially two groups of paramedics, those trained under legacy arrangements and those trained and educated within the newer HEI based programmes, typically at foundation degree, diploma and BSc level. The scope of practice of staff has therefore undergone an important legal change from a clearly defined or 'prescribed' range of procedures to a very different, status today, which is described in the *Paramedic Curriculum Framework* (2nd edition, 2008) document in the follow manner: *"*practitioners that manage individuals and groups of people whose ages range from the pre-term infant to the older adult. Managed care may involve the assessment, treatment of a relatively minor nature through to a complex major injury affecting either one, or occurring in many patients, such as those resulting from a major incident." *(*p. 21).

Three of the professional groups examined are required to meet some form of recognised written published standard, in the case of the paramedics the HCPC's Standards of Proficiency and Standards of Conduct Performance and Ethics. The key capabilities are defined thus:

- Practise within legal & ethical boundaries
- Practise in a non-discriminatory manner
- Maintain confidentiality
- Understand and obtain informed consent
- Exercise a professional duty of care

- Practise as an autonomous professional exercising professional judgement
- Effectively manage workload
- Understand the obligations to maintain fitness to practice
- Work in partnership with other health professionals and as part of a multi-disciplinary team.
- Demonstrate effective communication
- Assess health & social care needs
- Gather appropriate information
- Select & use appropriate assessment techniques
- Arrange investigations as appropriate
- Critically evaluate information
- Formulate & deliver plans to meet identified health & social care needs
- Utilise research, reasoning and problem solving
- Make professional judgements
- Conduct appropriate diagnostic or monitoring procedures
- Maintain patient care records
- Monitor and review the effectiveness of care

- Audit, reflect & review practice
- Know & understand key concepts of the professionally relevant bodies of knowledge
- Translate professional principles into action
- Establish, promote and maintain safe practice

The paramedic is therefore prepared to operate as a flexible provider of first contact care to the full range of patient presentations, across the acuity spectrum of injury and disease, with an emphasis upon acute illness & injury and with a role in disaster management as part of a range of capabilities.

Illustration 1

Illustration number 1 demonstrates the increasingly complex roles delivered by the ambulance service and paramedics. Top left, a conventional ambulance response, mid upper, showing a paramedic practitioner managing an urgent care case, right upper a simulated major incident response in the Dartford Tunnel under the Thames. Bottom left; responding to a patient with acute traumatic injury showing the work of critical care paramedics, bottom centre; a fast response motorcycle paramedic and bottom right; a HART paramedic dressed in protective equipment preparing to decontaminate a patient. Many other roles, such as working to supervise the

functions of emergency control centres and other activities are illustrated but not shown.

Illustrations of the six contemporary roles of Paramedics within civilian health services reflect the expanding role of the UK Ambulance Service and the paramedic profession. From top left, top row, conventional response, first contact primary care, which will increasingly become a post-registration specialisation within the paramedic career framework, and major incident management. The photographs shown above illustrate the ever-widening remit of paramedics

Until relatively recently all emergency responses to 999 calls for ambulance [and paramedic services] were carried out by crews of two ambulance staff in a conventional ambulance vehicle. Today a wider range of emergency vehicles are in use by NHS ambulance services and paramedics operate in an increasing range of roles, with specialist practice emerging, as has been the case in Medicine, Nursing and the other AHPs for many years. Outside the NHS, paramedics are also playing a role in the military, with all RAF Search and Rescue helicopters having at least one paramedic and within 'Medical Emergency Response Teams' (MERT) operations in Afghanistan. The RAF appear to have been more proactive than other services in utilising paramedics, but it seem likely that the other armed services will follow this approach.

IX.4/ Innovation and advantage

The Horizon Scanning approach requires that a 'product's innovation and advantage' is elucidated, in order that it can be defined and discriminated from other potential 'products.' 'The Oxford English dictionary's definition of 'innovation' is a) 'the action or process of innovating;' and b) 'the creation of ideas and the applications of ideas to solve problems.' There are however, gradations of innovation and one of the most energetic forms is known as 'disruptive innovation,' a term coined by Christensen (2009). It is described as a new technology [although the concept is not limited to physical technology] that has a serious impact on the status quo and changes the way people have been dealing with something, classic examples of the phenomenon being the telephone, radio, the computer, the digital camera, antibiotics, the internet, anaesthetic agents, heavier than air powered aircraft, space flight. "Disruption is therefore an innovation that makes things simpler and more affordable…..a new way of combining inputs of material, components, information, labour, and energy into outputs of greater value." (Christensen, 2009, p1).

In general disruptive innovation results in a new product or process, technology or competence within an occupational group, that when combined with a complementary business model transforms the demand for a mainstream market or service 'disrupting the established product or service provider'. Disruptive innovation theory has recently been applied as a frame of reference to explore the concept to health care, Christensen (2009) who offers examples of how new professional

groups, or established professional groups with new capabilities, can be 'disruptive' in a positive sense. Christensen regards this approach as analogous to the way that new technology is often regarded as 'disrupting' and replacing older technologies, bringing positive benefits, particularly in terms of cost. As with the replacement of any technology the supplanting of equipment, processes, practices or professional roles occur within a market. Table 20 has adapted this idea to a worldwide context and is drawn from Christensen's work.

Table 20: Examples of disruption to professions, demonstrating that the concept of 'disruptive innovation' is not unique to health care. (Adapted from p.111 of Disruptive Innovations, Christianson (2009).

Industry	Healthcare
• Architects disrupted by new CAD software.	• Nurses and AHPs developing their role over 20+ years.
• Disney illustrators, disrupted by Pixar's digital technology.	• Paramedics are classic examples of a 'disruptive technology'.
• Finance Professionals, disrupted by credit scoring algorithms.	• PPs diagnosing and treating primary care presentations.
• Law, Paralegals (particularly in the USA).	• CCPs performing more advanced procedures, airway management of pain etc.
• The key criteria for the above is 'performance', 'reliability' and 'cost'.	• There are also many examples of 'disruption' within medicine, for example, angioplasty.

Table 20 was adapted and added to from the innovator's prescription. The examples of nurses expanding their role into the provision of first contact, diagnostic practitioner roles is an early example of 'disruption,' and has now extended well

beyond primary care. Radiographers interpreting x-rays, whereas previously this was a role exclusively reserved for medically qualified Radiologists.

In this context, paramedics can be seen as an archetypical embodiment of disruptive innovation. Their precursor role as ambulance men and women took root within the comparatively simple operational requirement that emphasised providing first aid and transport. Circumstances, in the form of increasing patient demand and increasing patient care responsibilities, enabled this group to become clinically more capable, thereby adding value to their role. This trend has accelerated through the acquisition of graduate level skills. In consequence there has been a rapid move 'up-market' and both individual skills and expertise have improved and demand for their services has increased.

In terms of innovation and advantage these can be summarised as;

- Paramedics are the only group of qualified health professionals who at the point of registration, are specifically trained and equipped [and now increasingly educated] to meet the full-spectrum of patient need in the context of pre-hospital '999' emergency patient demand, albeit with certain limitations.
- They are also able to assess and manage situations and determine the most appropriate 'pathway', for example transfer to a specific hospital or referral to a range of community health services, by exercising clinical judgement They are therefore trained to operate as part of an emergency Ambulance Service or, again increasingly in other settings, as part of the wider health care community.

- All paramedics undergo specific training and preparation to take part in both responding to and co-ordinating any response to mass-casualty ‘major incidents’ and other scenarios that necessitate the use of command and control arrangements in structured collaboration with other emergency services.

- Allied health professionals, including paramedics are considerably less expensive than medical staff and paramedics are the only group of AHPs that are specifically trained to function in the emergency care, out of hospital setting, at the point of registration, without the need for extensive further training. However, it must be acknowledged that their individual clinical scope of practice at this level while not definitively ‘prescribed’ is generally contained within a range defined to some extent by national clinical guidelines. Their competency set was compared with medical and nursing skill sets on page 305 of the Horizon Scanning Section. They are by definition the ‘best-fit’ for a pre-hospital/out of hospital, emergency care delivery role.

IX.5/ Stage of Development

The paramedic ‘profession’ is only thirteen years old, with earlier experimental schemes dating to 1971 in the UK, but is well represented in all UK Ambulance Trusts and services, representing the qualified section of the ambulance personnel and approximately 60% of the total clinical labour force.

There are just under 20,000 registered paramedics, with 12,780 in front line service roles within the English and Welsh Services, (with an unspecified number in managerial role) according to NHS data returns. The majority of these personnel have been trained under older 'legacy' arrangements, which do not meet today's standards for new registrants. However, while the entry standard remains at a certificate level the majority of staff trained in recent years attain a Foundation Degree or higher award.

In 2012 the paramedic workforce, together with non-registered ambulance technician and ECSW colleagues, dealt with over 8,000,000 emergency and other calls from the public (KA34, DH, 2012) which is a substantial undertaking. The workforce is therefore gradually becoming more able and specialised, displaying similar characteristics to the medical, nursing and other AHPs. This progressive raising of standards, can be expected to help ensure that the ever changing needs and requirements in the patient population are now more likely to be addressed successfully; a point recently acknowledged in terms of the supporting drive for quality improvement in the NHS via Quality, Innovation, Productivity and Prevention (QIPP). The role of education in achieving more capable paramedic staff has been recognised in the Centre for Workforce Intelligence (CfWI) 2012 report.

IX.6/ Relevant Guidance from the National Institute for Clinical Excellence (NICE)

National guidance will be considered in two domains; guidance associated with regulation, Department of Health guidance relating to the employment of paramedics and policy regarding the use of Paramedics as allied health professionals.

In terms of regulation the HCPC Standards of Proficiency (SOPs) and Standards of Conduct, Performance and Ethics (SCPE) apply and these together with the QAA Benchmark Statement and the CoP Curriculum Guidance publication, define the standards that have to be met by all paramedic programmes.

DH Guidance, is summarised below, the discussion section integrates each of these areas into the appraisal.

- Taking Health Care to the Patient
- Reforming Emergency Care
- NSFs, NSF for CHD
- NSF for Children
- NSF for Older People
- NSF for Mental Health

- NSF for Diabetes
- Stroke Strategy
- Emerging Trauma strategy
- Patient Group Directives, August April 2001. Meeting the Challenge – a Strategy for the AHPs (November 2000). AHP Building Careers-Capturing the contribution of people in the AHPs (Jan 2000)

IX.7/ Relationship with NHS priority areas

The NHS Operating Framework lists five priority areas; each is addressed more thoroughly where directly relevant to the analysis in the discussion section. While represented in the form of a list this approach follows the guidance and format set out in horizon scanning guidance and is included, to comply with this convention summarising links with NHS policy.

- Improving cleanliness and reducing health care associated infections; [relevant to all NHS functions]
- Improving access through achievement of the 18 week referral to treatment pledge and improving access (including at evenings and weekends) to GP services; [Relevant in terms of out of hours services provided by ambulance services using paramedics and Paramedic Practitioners].

- Keeping adults and children well, improving their health and reducing health inequalities; [Relevant to the paediatric population serviced by paramedics, approximately 5% of call volume]

- Improving patient experience, staff satisfaction, and engagement, [relevant to all NHS providers].

- Preparing to respond in a state of emergency such as an outbreak of pandemic flu, learning from our experience of swine flu. [Relevant to paramedics and ambulance services].

- Subsequent additions to the operating framework include the provision of trauma networks. [Highly relevant, ambulance services and paramedics are integral parts of these arrangements, both in terms of co-ordination and the delivery of care, transportation and as part of the evaluation of services].

These areas are necessarily broad areas; nevertheless they have clear implications for the Ambulance Service and specifically paramedics as defined previously. Although generic in scope, many key health policy developments now mandate roles for paramedics in the recognition that operational policy cannot afford to overlook the pre-hospital contribution.

This recognition mirrors the psychological changes that were identified in the historical literature review and the acceptance by policy makers and planners that 'out of hospital' no longer represents the 'therapeutic vacuum' of the mid-20th Century.

During the last 12 years NHS policy has promoted significant clinical change through NSFs and other more specific publications. Cited as relevant within the horizon-scanning format, to emphasize the range of areas that are increasingly relevant to paramedic practice and referenced in later discussion, for example:

- NSF for CHD
- NSF for Children
- NSF for Older People
- NSF for Mental Health
- NSF for Diabetes
- NSF for Long Term Conditions
- Taking Health Care to the Patient
- Reforming Emergency Care
- Transforming Emergency Care
- Framing the Contribution of Allied Health Professionals
- Meeting the Challenge: A Strategy for The Allied Health Professions
- Tackling Demand together, a Toolkit for Improving Urgent & Emergency Care Pathways by Understanding Increases in 999 Demand 13th October 2009)

IX.8/ Clinical Need and the burden of disease

In the UK demand for ambulance Services/paramedics has been increasing at an average of 6.5% per year (*Tackling Demand together, a Toolkit for Improving Urgent & Emergency Care Pathways by Understanding Increases in 999 Demand* 13th October 2009). The average cost of each call is cited in this document at £200 per call, or £60 million in additional activity cost pressures annually.

The burden of disease and injury has been examined in the previous section in terms of the generated triage categories, using the AMPDS system, which has 36 triage classifications. Given the nature of the information gathering and triage process it is only feasible to 'presumptively' classify individual emergency calls by incident type, not by ICD 9 or 10 codes.

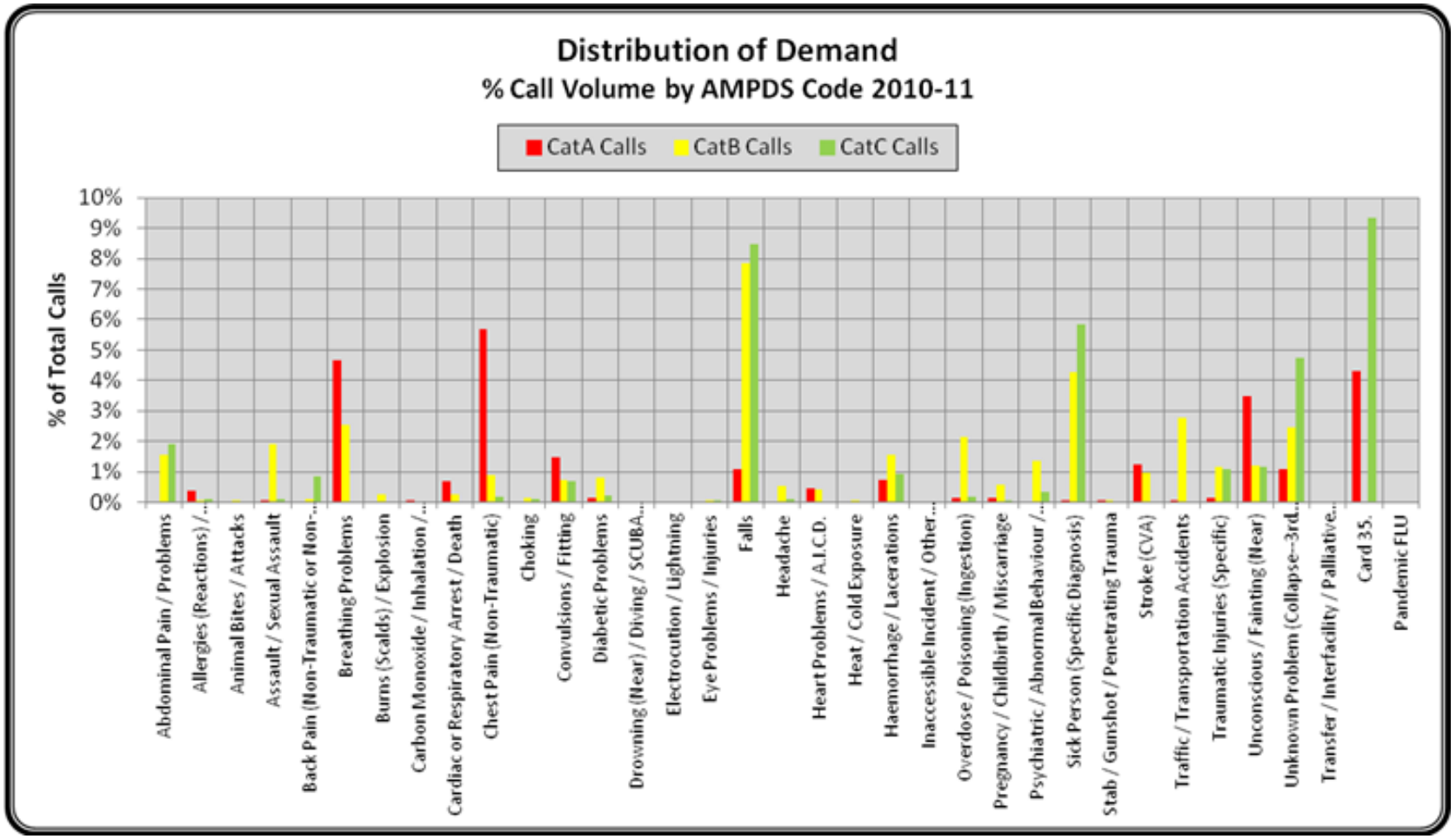

Figure 109: Call volumes AMPDS, triage system categories, data from 2011.

Figure 109 shows the breakdown of demand as classified by the AMPDS. In terms of the burden of treatable disease it is difficult to fully quantify the value of paramedic care given the vast spectrum of conditions that are dealt with by paramedics and the benefits from transport to further definitive care versus pre-hospital care.

In attempting to determine just how paramedic care, in particular, can be validated in terms of its effectiveness Myers, Slovis and Eckstein (2008) has approached the question using an evidence based framework introducing the concept of 'Numbers Needed to Treat,' (NNT), in an attempt to establish the benefit of advanced life support procedures provided by paramedics. It could be argued that a similar approach would apply in the case of other professional groups, but the following studies were focused in almost every case on ambulance and EMS that were delivered by paramedics. Most of these studies originate from the US and are therefore derived from the AAM. The measurement of clinical effectiveness has been widely discussed by commentators such as Bender (2001) and Schechtman (2002). NNT is used to represent the average number of patients to prevent an adverse outcome of a technique or a positive outcome. For example if some treatments might be expected to produce one additional life saved for every 10 patients treated, this would result in the NNT being 10.

Table 21: Numbers needed to Treat (NNT) by Clinical Scenario

Numbers needed to Treat (NNT) by Clinical Scenario			
Clinical Area	Elements	NNT	Harm avoided
STEMI [CVD, biggest cause of death in UK, 35%, 198,000 per annum, CHD largest sub component of CVD 48% of total deaths in this group; STEMI = 69,113]	Aspirin, 12 lead ECG Transport to pPCI	15	Death, stroke, 2nd MI, [limits myocardial damage in survivors, including those who would not die as a result of the MI]
STEMI (as above)	Pre-hospital thrombolysis, including thrombolytic, aspirin & heparin	25	Death & limits myocardial damage in survivors, as above.
Pulmonary oedema resulting from heart failure. [24,000 deaths p.a., regarded by BHF as likely underestimate, 4% of all deaths].	Non invasive ventilation [CPAP]	6 8	Need for endotracheal intubation Death
Trauma [16,000 deaths p.a., in	Patients with ISS > 15 removal to a	11	Death (1)

England and Wales, number of deaths increasing and the leading cause of mortality between the ages of 1 and 44, 3% of all deaths].	trauma centre		
Trauma (as above)	Patients over 65 with ISS > 21	3	Death (1)
Cardiac Arrest	Defibrillator to the scene in < 5 minutes rather than < 8 minutes	8	Death (1)
Cardiac Arrest VF/VT	Early defibrillation	5	Death (1)
Cardiac Arrest	Hypothermia Post Cardiac Arrest	4 6	Improved neurological Survival with return to normal neurological outcome
Seizure [Epilepsy is the most common neurological condition, with 456,000 cases in the UK. Epilepsy carries an increased risk of mortality and	Administration of benzodiazepine for status epileptics	4	Persistent seizure activity

there are approximately 1500 seizure related premature deaths p.a.]			
Stroke, [second leading cause of death, 53,000 p.a., 9% of all deaths. Major cause of disability in survivors]	Removal directly to a specialist stroke centre	2 (within 1.5 hours) 8 (within 3 hours) 14 (within 4.5 hours)	Death (1) Death (1) Death (1)
Hypoglycaemia	IV 10% dextrose or glucagon	1 (estimate)	1 (estimate) Persistent unconsciousness state, with risk to neurological function & potential risk of airway compromise and potentially death.

Modified from Evidence–Based Performance measures for EMS Systems: A Model for Expanded EMS Benchmarking, Myers et al Pre-hospital Emergency Care (2008).

Table 21 gives a strong indication as to the value of pre-hospital paramedic delivered care and is illustrative of only a small proportion of total demand, in the order of 5-10 percent of the total, but this segment is the more acute and hyper-acute element of the case mix with real opportunities to influence patient outcome in

terms of mortality and morbidity. It is much more difficult to measure the effectiveness of treatment in patients with non-life-limited conditions, where patient satisfaction and experience are important indicators.

IX.9/ Place of Use

Paramedic services represent an enhancement to traditional transport focused Ambulance Services and provide the means to deliver increasingly sophisticated mobile health services, including ALS procedures. As with ambulance services generally, the objective of paramedics is to provide clinical care wherever it is needed 24 hours per day and 365 days per year. This capability extends to incidents involving a single patient to those involving mass casualties, including victims in inaccessible locations or those suffering biological or radiological contamination.

Increasingly, paramedic services, can function across the spectrum of urgent and emergency demand in both ambulances and other vehicles and in static facilities, such as Walk in Centres, General Practice surgeries, Health Clinics and other localities. Paramedics also work in less traditional organisational settings such as the military, private industry, examples including offshore and remote health care in the oil exploration sector, event/film production and in other general health care settings, as identified in the ‘target group for scan section.’ However, it should be noted that there are dangers in extending the role into other areas, which would be

inappropriate without associated training, education and clinical governance, together with appropriate links to other health care groups including medicine.

IX.10/ Developers

In the UK there are 69 accredited, or in HCPC parlance ‘approved’ paramedic programmes. Not all of these courses are recruiting students, although technically they remain eligible to do so; in practice approximately 50 paramedic programmes remain active. The number of courses is large for a relatively small profession. Physiotherapy, which is a considerably larger and more established profession, with more than double the number of registrants (45,402) has 77 academic programmes all at BSc level or above.

With the continued progression toward academic programmes for paramedics it is likely that the numbers will fall somewhat as legacy training programmes are progressively closed and replaced with validated academic courses offered with HEIs at a level of Foundation Degree and above. The CoP is seeking to move the entry level for paramedics to a BSc level. To help gain support for this objective an educational stakeholder event, co-hosted by the HCPC and the DH took place in early 2013. This gathering was linked to the ‘Paramedic Education Evidence Project (PEEP) Report which was commissioned by the CoP to consider what changes to educational provision might be required in the future. The development of programmes is therefore no longer the direct responsibility of employers, who have been largely, but not completely, replaced in this role, by the Professional

Body, HEIs and the regulator. However, greater employer involvement is possible with post-registration programmes, which by their very nature are less clearly defined and have no national approval or validation mechanisms surrounding their development. They are, therefore, more likely to be constructed with reference to employer defined needs.

The overriding concern is that there are too many differences within the current programmes which also, confusingly, are offered at a variety of academic levels. Until greater standardisation occurs, the paramedic as a 'product,' will continue to be simply too varied to reach its full potential. Inevitably, this represents a potential threat to quality that will need to be addressed. Effectively, the risk of a multi-tiered paramedic workforce with a combination of vocational training programmes, coupled with a situation that includes an increasing number of new staff flowing from HEIs, does create something of a two-tier workforce. To some extent this would be inevitable for any professionalising group that is moving to a more education based mode of preparation, but the time taken to move from one model to the other, will ultimately have an effect on how quickly the whole profession can be readied to meet emerging challenges.

IX.11/ Efficiency & Safety

The NHS and individual health professionals are increasingly aware of patient safety, which has received much greater attention during the last decade, with the advent of the National Patient Safety Agency (NPSA). The NPSA was formed in the wake of a number of high profile reports and publications in both the United

States and several other developed health care systems, it has since been stood down and its functions merged into the NHS Commissioning Board as of June 2012. Earlier publications that highlighted the need to address the issue of patient safety included '*Demanding Medical Excellence*,' Millenson (1999) and '*To Err is Human*,' produced by the US Institute of Medicine's Committee on Quality of health care, edited by Kohn and Corrigan (2000) and a series of reports published in the BMJ in 2000.

The theme of these commentaries was that health care is a much more hazardous endeavour than many members of the public or health professionals themselves appeared to understand, with harm caused, in most cases by human error, leading to death accounting for something in the order of 40,000-98,000 deaths in the USA and as many as 40,000 deaths in the UK. This would make errors in health care a leading cause of mortality in the developed world, making this phenomenon somewhere between the 5th and 8th most likely reason for death. It would also infer that up to 10% of all hospital admissions result in injury. It is also difficult to divorce the organisation in which practitioners operate and individual practice, as the two are intrinsically linked, with errors taking place 'not in a vacuum, but in an organisational context' (Reason 1997). The key DH policy document in this area, which was published to coincide with the founding of the NPSA, '*An organisation with a memory*,' (2000) [quickly followed by supplementary guidance '*Building a safer NHS*,' 2001] suggested that adverse events were indeed occurring at a rate of 10% of hospital admissions, accounting for 850,000 cases annually, with financial liability standing at £2.4 billon, an amount that has continued to rise since this time. This report advocated a move to develop a national reporting and learning system,

which was subsequently introduced and this data is the basis for any assessment as to the safety of ambulance services and paramedics.

Limited data is available in respect of ambulance services and paramedic practice, with a number of higher risk areas of practice being acknowledged, including patient assessment and consequent errors in treatment, particularly in response of transport decisions. Brice, Friend, and Delbridge (2008) identifying documentation errors and Kothari, Barson, Broot, Broderick and Ashbrock, (1995) considering paramedic practice in stroke assessment found a high rate of misdiagnosis, although McAllister et al (2004) in a UK study found that paramedics performed better than GPs in this respect. Medication errors are frequently reported in health care and can be the result of poor compliance with clinical practice treatment protocols and guidelines, as reported by St. Pierre, Hofinger and Buerschaper (2008) and confirmed by others, including Bissell et al (1999). Wang, Lave, Sirio, and Yealy (2006) and Lossius, Røislien and Lockey (2012), whose meta-analysis involved reporting high error rates in respect of endotracheal intubation [a particularly topical area] among 'non-physicians.' Rittenberger, Beck and Paris (2005) found essentially similar concerns when considering the practice of Emergency Physicians, as did Arntz, Klatt, Stern, Willich and Bernecker (1996), indicating that such concerns are likely to be a factor across professional groups.

In the UK, there has been comparatively little interest or research in the pre-hospital/Ambulance Service area, although there has been a national drive, lead by the NPSA and to some extent the National Health Service Legal Authority (NHSLA) more indirectly. In terms of levels of risk and the consequent financial liability

placed upon organisations as the result of legal challenges, Ambulance Service rates appear well below hospitals and most other health care providers. Actual legal cases are relatively rare, but by no means unprecedented, with the most common claims in relation to treatment clustering around maternity, spinal and conveyance issues. Despite this, English courts, as noted by Williams (2007), have been reluctant to hold emergency services to account for negligence. In order to help mitigate the risk the NHSLA publishes regularly revised comprehensive standards in terms of risk management (2012/13). It has been widely recognised that in any complex 'socio-technical' system, such as health care, there is a need to pay particular attention to the human element.

Increasing interest in the 'human element' or 'human factors,' defined as an 'umbrella' term for several areas of research that included human performance and the interaction with technology NASA (Ames, 2000) is now becoming more central to the risk management agenda. Newton, Benn and Rhodes (2001) have suggested that one technique for addressing this burden of errors, resulting from human factors, was to implement lessons from the aviation and other industries and some of which are being incorporated into areas of health care. These approaches tend to focus on team training that promote competency in non-technical skills, which emphasize behaviours such as leadership, co-operation, situation awareness and decision making, sometimes collectively termed 'crew or crisis resource management.' Only very limited progress has been made by ambulance services or other pre-hospital providers in integrating these methods.

The NPSA receives reports from 11 regional and one directly acute sector managed Ambulance Service and indeed all other NHS organisation on a monthly basis. In 2009, 945,520 reports were made, of which 2,546 originated from ambulance services. The extent of harm caused is considered using the following reporting criteria.

- No harm incurred
- Low (Minimal harm - injured party required extra observation or minor treatment)
- Medium (Short term harm - injured party required further treatment or procedure)
- Severe (Injured party sustained permanent or long term harm)
- Death (caused as direct result of incident)

Locations where incidents occurred were considered using the following list of potential sites.

- Ambulance Service
- Acute/General Hospital
- Community & General Dental Service
- Community Optometry/Optician Service
- Community Pharmacy

- Community Nursing, Medical and Therapy Service (including Community Hospitals (CHs))
- General Practice
- Learning Disabilities Service
- Mental Health Service

Prior to the dissolution of the NPSA quarterly updates were issued nationally, permitting comparisons between organisations. Although, this information is no longer available it is possible to draw upon one Ambulance Trust's data, which considers 'adverse incidents', by grade of staff, in this case ambulance technicians and paramedics. Paramedics are involved in a relatively low number of incidents, but in most cases it must also be acknowledged that harm could have been avoided through a combination of better systems, procedures and possible crew resource management (CRM) type training. Fatalities are particularly rare, but have been identified through serious untoward incident reports (SUIs), now reclassified as 'Serious Incidents Requiring Investigation,' which together with vehicle accidents, delayed response times, figure prominently in table 22. In terms of harm, resulting in injury rather than death, medication error, diagnostic errors, especially in respect of decisions to transport were represented.

Frequency of patient safety incidents by clinical grade.

Table 22: Frequency of patient safety incidents by clinical grade. 100 Incidents by Category and Job title April 2009-March 2010, from NPSA ambulance service reporting system.

	TOTAL TECHNICIAN	TOTAL PARAMEDIC (INC. CTL)	TOTAL PP/CCP	TOTAL REPORTED
Delay in service provision (where the delay is primary issue)	16	14	0	30
Driving or vehicle related incident (where no staff injury)	55	24	0	79
Equipment failure (where patient/treatment unaffected)	51	61	0	112
Security issues (equipment or facilities)	31	53	1	85
Infection control incident	33	23	1	57
Information / Records governance and information security	9	10	0	19
Other uncategorised event	10	3	1	14
Patient safety incident: Clinical	42	37	1	80
Patient safety incident: Non Clinical	41	28	0	69
Issues concerning use of resources	75	51	1	27
Staff safety incident: Accident (Not manual handling)	49	30	1	80
Staff safety incident: Physical assault	21	18	0	39
Staff Safety incident: Health and	10	9	0	19

Safety issues				
Staff safety incident: Manual handling	65	33	0	98
Staff safety incident: Threats and aggressive behaviour	88	43	0	131
Staff safety incident: Verbal assault	35	22	0	57
Staff issues and grievances	30	17	1	48
Staff concerns	25	12	0	37
Technology or systems malfunction	2	0	0	2
Vulnerable adult or child protection issue	44	32	0	76
Totals:	732	520	7	1259
Percentage:	58%	41%	1%	

Any analysis attempting to address the safety of paramedics or paramedic practice is problematic for a number of reasons. Determining liability for a particular incident can be difficult, as there is usually a system cause as well as those that relate to the individual practitioner. Reporting systems, while much improved are also of limited value and it is difficult without going into the base data to determine which incidents are attributable to paramedics, technicians and other staff, such as control room personnel. It is however, reasonably clear that despite the fact that out-of-hospital care is often provided in sub optimal and sometimes inhospitable conditions in stressful environments, the numbers of cases that result in deaths or serious injuries that can be identified as having paramedic involvement appears to be low. This is particularly the case when considering the wider NHS. There may well be

under-reporting of incidents, but SUIs or SIRIs and the associated legal claims would be likely to surface in any event. On this basis it seems reasonable at this time to claim that paramedic practice is not resulting in mortality or morbidity that is out of line with that experienced in other professional groups. In making this statement it is necessary to also conclude that the whole area of risk and harm in pre-hospital care is under researched, while also noting that paramedics show a higher rate of referrals to the HCPC than most other AHPs (HCPC *Fitness to Practice Report* 2011). this may be an important finding related to the actual safety profile of paramedics, or it may be the result of the particular environment and conditions under which paramedics practice

IX.12/ Existing Comparators

Several staffing alternatives are currently available for the management of patients in the pre-hospital setting. Comparators take three or four forms dependent upon perspective and definitional considerations.

- Ambulance Technicians, (Emergency Medical Technicians) operating at levels 3 and 4 of the NHS career framework.
- Qualified Nursing Staff (operating at level 5 and above in the NHS career framework)
- Qualified Medical Staff (operating at the equivalent of level 5 and above in the NHS career framework)

- New Practitioners (typically operating at level 6 and above in the NHS career framework)

For comparative purposes this analysis will concentrate on staff operating predominately at entry level, career framework level 5 or at level 6 (the majority of the paramedic workforce sits within level 5 with specialist paramedic practice at level 6 and with some consideration of the higher levels and pay bandings, which will be explored in more detail in the cost comparison section.

IX.12.1 Ambulance Technicians

Technically, non-registered lower level [support workers in NHS career framework language] providers, particularly ambulance technicians, sometimes referred to as 'Emergency Medical Technicians,' which is also the title used in the United States, have traditionally undertaken much of the work of the Ambulance Service and some activities of paramedics. There are therefore potential areas of overlap, with the exception of the level of patient assessment and ALS procedures. Indeed, paramedic practice 'extended ambulance aid,' emerged in the 1970s. However, since the advent of professional registration the gap has widened considerable in terms of legal and clinical responsibilities.

Ambulance technicians figured prominently in the early phase of this research exercise, given that when the investigation commenced technicians represented more than 50% of the Ambulance Service workforce. At this time they also made up the majority of entrants to the paramedic training and education courses, but this situation has now been reversed, with increasing numbers of paramedics joining the

paramedic profession from HEIs. This has led to less emphasis being placed on ambulance technicians and, as noted previously, training programmes of technicians have all but ceased in the UK, with the support worker ECSW grade taking up some vacant technicians positions within the Ambulance Service's establishment.

There remains an increasingly remote opportunity to do more with the ambulance technician role, but it seems unlikely that it could be easily developed into a delivery of more comprehensive patient assessment or that it could absorb a broader range of clinical skills. All trends therefore appear to run counter to such notions. At this stage ambulance technicians cannot therefore be considered direct comparators and will be discounted from this section of the analysis.

IX 12.2 Qualified Nursing Staff

In the United Kingdom there are over 690,000 registered nurses, with only a very small number, somewhere in the region of 300 working in the Ambulance Service, of which a proportion are also registered as paramedics with others working in non-direct patient care roles.

Although rare in the UK context nurses are utilised in the pre-hospital [Ambulance] care delivery role in a number of EU countries, specifically, Sweden, Finland, the Netherlands (Gras 2011) and 'Ambulance Care in Europe' (Ambulancezorg, Nederland 2010) and, to an extent, often supporting medical practitioners, in a number of other EU states and more widely throughout the world, particularly outside the Commonwealth. Sweden, is a particular case in point, given that it

adopted a nursing model in the 1990s (Suserud 2005). However, Suserud acknowledges that concerns over unfamiliarity with specific [pre-hospital/ambulance] surroundings, as noted by Sheehy (1989), led to the need to create a specific ambulance/pre-hospital [paramedic type] course for Swedish nurses (Ekstrom, Herlitz, Holmbery, Wennerblom and Kihlgren, 1993). Nurses without this preparation have been shown to have a lower level of competence (Bearden et al 1993). Two factors have been cited as leading to the use of nurses, first, a regulation passed by the Swedish National Board of Health and Welfare insisting upon a minimum of at least one qualified nurse on each ambulance. The second and largely practical issue, related to Swedish law, which forbade anyone other than a physician or nurse from providing medicines to patients, via prescribing or standing order respectively.

Despite EU system Directives [92/41 and 43/91] which are designed to help ensure broad equivalency and some level of standardisation of emergency health care systems (therefore not specifically ambulance or pre-hospital related practice) the World Health Organisation, describes both paramedic and nurse roles in ambualnce services as ‘substantially different across countries’. Achieving standardisation and quality improvements are unrealistic at the present moment,’ (Emergency Medical Services System in the EU).

In the UK there has been a recent attempt to recruit nurses at NHS Career Framework Level 5 using the standard paramedic job description in one English Ambulance Trust. An article in the on-line edition of the Nursing Times cites a correspondent, M Ainsworth, stating that the difficulty in recruiting paramedics

implied the need to utilise nurses in the role. In 2012 The South Central Ambulance Service NHS Trust continues its active recruitment of nursing staff. The professional and educational scope of nurses is defined in a number of documents, including the Nursing and Midwifery Council, who publish Standards of Proficiency for the profession. The Royal College of Nursing and the Quality Assurance Agencies, *Benchmark Statement for Nursing*, which is a particularly extensive document running to 26 pages (the Benchmark Statement for Medicine is 9 pages in length).

These documents contain no reference to Ambulance Service based care and do not appear to have been developed with any expectation that nursing staff would assume such roles in the UK. There is therefore no specific learning outcome of the type established in the comparative documents for paramedics and the training and education of nurses does not seek to produce a competent pre-hospital practitioner who would be fit for purpose in the context of an Ambulance Service clinical role. Neither is there a body of literature seeking to promote the safety and effectiveness of ambulance nursing, although it cannot be discounted that there may be literature, which is not published in English. While the development in the one English Ambulance Service that has introduced the role does not follow the national approach, it does, however, provide an indication that further developments may occur in this area. The data showed in the horizon scanning section does not therefore support the contention that the nursing profession are a serious contender for supplanting paramedics at this time.

IX 12.3 Qualified Medical Staff.

As with nursing, medical practitioners are utilised for the provision of pre-hospital care, including ambulance delivered care systems in certain countries in the EU and in other parts of the world that follow the 'Franco-German' Ambulance Service system design, particularly Russia and some South American countries. This has not been the practice traditionally in the UK, most commonwealth countries or the United States, although the picture is a complex and rapidly changing one in England.

The GMC registers over 218,000 doctors in the UK and sets standards of practice and conduct; competencies and attributes are articulated and summarised in '*Tomorrow's Doctors, the New Doctor, and Good Medical Practice'*, (General Medical Council, 2003). As with nurses and paramedics, the QAA maintain a benchmark statement. Basic level registration competencies include the diagnosis and initial management of common medical emergencies and include the examples of cardiac arrest, anaphylactic shock and the management of the unconscious patient. In this respect medical practitioners are well prepared to provide the role of first contact clinician in terms of clinical knowledge. Nevertheless, in common with nursing, neither the registration standards nor initial medical school training take account of graduates functioning in an ambulance service role and placements in this area are similarly lacking. In common with nursing there are many gaps in knowledge and basic technical skills that would be required to operate outside the hospital in emergency ambulance settings delivering care in the street, although

most of these skills could be acquired through ambulance technician/paramedic type ‘training,’ in combination with some supervised field experience.

Unlike the previous example of a situation where a direct substitution of an ‘ ‘ambulance nurse’ at the same or very similar career level and pay band has been attempted, this is not the pattern emerging in respect of medical interest in extending its influence in the UK. Instead a sub speciality of Medicine has been advocated and an application for Postgraduate Medical Education Training Board (PMETB) approved, including a full-curriculum, which includes many ‘ambulance/paramedic specific’ attributes mirroring the Paramedic Standards of Proficiency. The Faculty of Pre-Hospital Care (FPHC) a sub division of the Royal College of Surgeons in Edinburgh is leading this development and has previously produced a qualification, termed the Diploma in Immediate Care in 1988, after originally proposing the idea in 1984. The FPHC describe the aims/objectives of their organisation as:

- To set and maintain standards of practice in pre-hospital care.
- To promote education and teaching in pre-hospital care.
- To initiate technical development and research in pre-hospital care.
- To integrate effectively the efforts of all participants in pre-hospital care and to harmonise and facilitate onward management of the sick and injured.

The FPHC figures strongly in the Horizon Scan and are key drivers for the acceleration of medical interest in pre-hospital care. Indeed one of their Board Members has produced a template for this aspiration, an approach described in a

special BMJ supplement in (2011) which strongly advocated for a medically led and directly clinical provided pre-hospital care system. The preposition underpinning this argument is that there are two groups of patients that would benefit from such a service, one of which is currently the responsibility of the Ambulance Service and paramedics, 'those [patients] needing critical care.' The second group considered are patients requiring interfaculty patient transfer, who are currently the responsibility of individual hospital clinicians collaborating in critical care networks, these arrangements are made up largely of doctors and nurses working in intensive care units. The proposed 'pre-hospital' sub-speciality doctors would therefore undertake the inter facility transfer work replacing the existing staff.

The contention of Mackenzie et al (2009) is that the former group of patients represents approximately 0.5 – 1% of total 999 calls. This seems rather on the high side given that only 8–10 percent of patients have significant 'acute' care needs [MI, major injury and stroke etc] and of these, rapid transport with on-going, ALS care, care of the type for which Paramedics were designed, would be more than adequate in the majority of cases. Mackenzie et al, go on to provide some support for his position in both his original paper and at the annual Maurice Ellis Lecture (2009) he cites a number of papers that support the provision of physician based care on patient outcome. In doing so he quotes from a publication by Brazier, Deverill, Green, Harper and Booth (1999) which contends that 'evidence based policymaking cannot depend on randomised control trials'.

One trial, conducted in the United States offering class '2' evidence indicates a more favourable outcome for seriously injured patients when treated by an aero

medical team that included a doctor (Baxt and Moody 1987). However, another trial (Liberman, Mulder and Sampalis 2000) conducted in Canada, which found a higher mortality in the physician treated group is not offered to counter-balance this view When considering the question of 'Paramedic led', [i.e. paramedic provided clinical care with medical oversight and clinical governance] versus 'Physician led' [physician provided clinical care], the Department of Health (DH) funded '*Emergency Services Review, a comparative guide of international best practice'* (2009) concluded that "neither [system design] outperformed the other"…'page 46, 13.3.

In summary, it is reasonable to assume that a one for one substitution could be made with a doctor substituting for a paramedic, but additional 'ambulance/pre-hospital skills' training would be required for the medical practitioner. Equally, first level paramedic training would need to be enhanced to a more advanced level, with a similar skill set, before it could be suggested as a viable alternative to medical staffing. In each case a cost benefit analysis and ideally a more complete understanding of patient outcomes would be appropriate.

IX 12.4 'New Practitioners'

In recent years new concepts of practitioner, one imported from the United States, the PA, and another created in the UK during 2003, by the MA and called the ECP have been developed. Both are contentious, the ECP particularly so within the UK, as previously explored in the historical literature review and principally because ECPs are drawn from the ranks of existing NHS staff, principally paramedics, but also nurses consequently not opening up a new route or providing clinical staff from

previously untapped sources of labour. These staff undergo additional training in patient assessment and minor illness and injury management, typically over a period of three months. The situation with PAs is different, although some do come from NHS clinical staff, there are also direct entry routes available too.

The reasons for concern, which are essentially threefold, have been set out in detail in *'The Paramedic Practitioners and the ECP Doppelganger what's the difference? (Newton, 2007. Appendix IV)* This paper was submitted to the Ambulance Service Medical Directors in October 2007, summarised concerns, raised in the ECP consultation feedback exercise, particularly those voiced by the Higher Education Ambulance Development Group (HEADG). The areas highlighted included, the issue of undefined 'autonomy,' duplication with other initiatives, such as the Paramedic Practitioner and Nurse Practitioner, together with concerns over renaming existing registrants in direct contravention of the wishes of the HCPC and the CoP's wishes. A statement to this effect appears on page 26 of '*Taking Healthcare to the Patient 2'*, which noted that the regulator held a strong preference for [paramedic] registrants to be referred to by their closed title of 'Paramedic' not other designations. The report went on to conclude that there was evidence supporting an extension of role for paramedics and of personnel operating in 'extended roles' Woollard (2007).

The staff drawn into ECP schemes have originated almost exclusively from registered personnel, principally paramedics or nurses, with a very small number of exceptions perhaps no more than one each from physiotherapy and pharmacy, and therefore retain their primary registration. There are approximately 700 staff that

could claim this designation, or at least a degree of extended clinical practice, although many other titles are also in use leading to confusion. Efforts have been made previously to 'hive off' these personnel and to create a new independently registered group of health professionals, but this threat has recently receded. The Skills for Health agency (2010) describe the role as:

"Emergency Care Practitioners, were developed out of the Practitioner in Emergency Care (PEC) concept, which was first suggested by the Joint Royal College Ambulance Liaison Committee and the Ambulance Service Association'.

The Emergency Care Practitioner role is part of a wider reform of the way in which urgent care is developed. The main focus of the role is to enhance the patients experience through their emergency, urgent and urgent care journey by providing emergency assessment, diagnosis, treatment and aftercare.' (Page 9)

Data determining the safety and effectiveness of the role is limited and slightly contradictory and confused by the inter-changeability of terminology, the multiplicity of courses and different practice setting as described above. However, it is clear that it is this 'new practitioner' was, for a time at least, heavily promoted, over and above an extension of role for paramedics within the AHP career framework, indeed for a time paramedics were specifically held outside this structure, while development of the ECP continued. These oversights have now been largely corrected and the new version of the NHS careers advice leaflets, have removed the term, switching to 'specialist paramedic' in line with CoP advice contained in their Position Statement on 'Specialist Practice.'(Appendix III, JPP articles).

The PA, represents another group of ‘new practitioners,’ developed in the United States during the 1960s and was designed to address the shortage of medically qualified labour in rural areas in the United States (Reedy 1978). Although not well established in the UK or registered to operate as health professionals, a small number of training programmes have been developed and the numbers of these staff are gradually increasing (Stewart 2005). Hutchinson, Marks and Pittilo (2001) have suggested that a US style PA might ‘meet the needs of the NHS’.

PAs are not yet registered health professionals, but could become so in the future. Given their training it is apparent that there could be an overlap with paramedic practice, particularly paramedic practice beyond level 5 in the NHS care framework:

- Taking medical histories
- Performing examinations
- Diagnosing illness
- Analysing test results

Physician Assistants are a small group of personnel in the UK currently, with only a few universities offering programmes generating these practitioners, but numbers can be expected to rise and their professional association is seeking voluntary regulation. The role of PA is described as:

> *…a new healthcare professional who, while not a doctor, works to the medical model, with the attitudes, skills and knowledge base to deliver*

holistic care and treatment within the general medical and/or general practice team under defined levels of supervision.

Reedy (1978), The New Health Practitioners in America. (p.21)

This definition is unsurprisingly similar to that provided for the ECP and while not specifically designed to compete with paramedics, the role does have a good deal of commonality with the higher level career framework for those specialist paramedics operating at career framework level 6 and above.

IX 12.5 Comparing competencies in the various professional staff options

Table 23 has been derived, extended and adapted from Baskett's (1993) publication, which displays skill level, by grade in a similar fashion to aid comparisons between skill mix options. The approach has been updated and widened to permit accurate contemporary comparisons to be made, primarily between different professional groups. The skill sets are determined at the point of registration for paramedics, nurses and junior doctors or, in the case of new practitioners and senior level medical practitioners, at the point of completion of training. Additional columns have been added for the doctors, due to the fact that an increasing number of medical staff who are well beyond first registration level practice are progressively becoming involved in pre-hospital care. The purpose is to permit a more accurate comparison of the staffing groups with reference to their competencies at the point of registration or at another level of practice where specified.

Table 23: Advanced Life Support - Skills Matrix by Professional Group. Developed from Baskett (1993). The concept of considering each grade of clinician by skill set, has been updated in this matrix.

	Lay Public	Paramedic	RN	New Practitioner Registered Health Care Professional	New Practitioner Non – Registered i.e PA	PRHO – Newly qualified doctor	FY2 or Specialist Registrar	Consultant/ Staff
Assessment Primary	√	√	√	√	√	√	√	√
Assessment Secondary	x	√	√	√	√	√	√	√
Control of Spine	√	√	?	√	?	√	?	√
Basic Airway Control	√	√	√	√	√	√	√	√
Expired Air Resuscitation	√	√	√	√	√	√	√	√
External Cardiac Compression	√	√	√	√	√	√	√	√
Oral Airway	x	√	√	√	√	√	√	√
Laryngeal Mask	x	√	x*	x*	x*	?	?	√
Endotracheal Tube	x	√	x	x	x	x	?	√
Cricothyrotomy	x	√	x	x	√	?	√	√
Mouth to Mask	√	√	√	√	√	√	√	√
Self-inflating bag	x	√	?	√	?	√	√	√
Automatic Resuscitator	x	√	√	√	?	√	√	√
Electrocardiogram Interpretation	x	√	?	√	√	√	√	√
Automatic defibrillation	x	√	?	√	√	√	√	√
Manual defibrillation	x	√	x	?	?	√	√	√
Control of Haemorrhage	√	√	√	√	√	√	√	√
Peripheral IV access	x	√	x	√	√	√	√	√
Central IV access	x	√	x	x	x	?	x	√
Intra osseous access	x	√	x	x	x	?	x	√
Arterial Cannula	x	x	x	x	x	?	?	√
Needle Thoracostomy	x	√	x	x	x	√	√	√
Chest Drain	x	x	x	x	x	?	?	√
Pericardiocentesis	x	x	x	x	x	?	?	√
Entonox	x	√	√	√	?	√	?	√
Opiates	x	√	x	x	x	√	√	√
Ketamine	x	?	x	x	x	√	?	√
Regional Anaesthesia	x	x	x	x	x	?	√	√
Drug Assisted Intubation	x	x	x	x	x	x	x	√
Manual Handling of ill/injured patients in the pre-hospital setting	x	√	x	x	x	x	x	√
Scene Safety Training	x	√	x	x	x	x	x	?

* If they are a registered paramedic

This table is an amalgam of clinical skills that would be expected to be available to patients in an emergency care setting. Typically, a narrower range of skills is available in the pre-hospital phase, with the emphasis upon rapid assessment, treatment and transportation. The range of skills by paramedics has increased in recent years, with some drugs, such as Ketamine being accessible to paramedics due to recent changes in legislation. However, this drug would not be expected to be in the possession of a newly qualified paramedic as yet. The table therefore represents the skills of a first level paramedic or other health professional, with the exception of medical personnel where different grades are considered.

IX.13/ Cost Analysis

The purpose of this section is to provide an indicative cost comparison that considers only two of the above staffing groups paramedics and medical staff. These two groups were chosen, as they appeared to be the two most likely workforce options based on data from the horizon scan. The emerging picture was that while nurses and new practitioners did indeed represent groups who could assume the function of paramedics, the data in the results section indicates that by 2012 this seemed to be much less likely than when phase B of this study commenced. Furthermore, other alternative staff groups, nurses and new practitioners, would be expected to operated at a similar salary band to paramedics they displaced, making cost comparisons less valid.

The paramedics were considered to be operating at level six of the AHP Career framework and for the purposes of this exercise at Critical Care Paramedic level and pay band six of the NHS Agenda for Change remuneration levels. The medical staff were considered to be operating at consultant level. These cost estimates are reproduced with permission, from the work of Dr Ashok Jashapara and were originally published in his '*Critical Care Paramedics Delivering Enhanced Pre-hospital trauma and resuscitation care: a cost effective analysis*.' This work was the result of an Economic and Social Research Council (ESRC) and Service Development Organisation academic placement (Jashapara, 2010)

The model for the introduction of fully funded medically qualified personnel into pre-hospital care used by Dr Jashapara considered a number of options for making these calculations. The most directly comparable was to operate either a medically staffed or a paramedic staffed unit in each of eight Primary Care Trust Areas, (PCTAs) then in existence in his study area. To provide a medically staffed service was judged to cost £3,030,412 annually, whereas the paramedic staffed alternative would cost £272,475. The number of lives saved per year through these arrangements were calculated to be 12 and 8 respectively, at a cost per life saved of £252,542 and £34,000 for medical and paramedic models.

There are clearly limitations to the above costing approach and it is therefore very difficult to corroborate these calculations. Health economic analysis of this type is very rare and it is therefore an area that requires much greater development. Further research and attention from those addressing the issue from a heath economics' perspective, is urgently required.

IX.14/ Limitation of this Study

The initial scope of this study embraced important areas that required attention in respect of the then current training patterns. However, rapid change risked overtaking the relevance of at least some of this work in the early stages of the study. The timeline to developing the project therefore became problematic. However, while this was true the remaining aspect of what came to be known as Phase A, which dealt with the desires and ambitions of staff in respect of their education, became ever more relevant. With hindsight this might have been anticipated or if personal circumstances had been different the earlier study could have been concluded more rapidly.

In terms of technical limitations in respect of Phase A the questionnaire design proved to be a critical point. While testing did take place through piloting, it is now clear that this needed to be more extensive to enhance the validity of the research instrument thus making it more 'future proof'. It would certainly have been feasible to include issues such as ethnicity and more comprehensive demographic measures. This represented one aspect of methodological difficulties.

When considering Phase B it is again only fair and reasonable to acknowledge that events again moved more quickly than anticipated, but with less detrimental implications for the study's outcomes. In some respects the rapidly evolving circumstances did not overly hamper the approach employed, but the novel nature of

the horizon scanning methodology proved challenging in its application given the time constraints of the study.

Dissemination and Future Research Opportunities

One of the most heartening aspects of the research is the level of interest shown in it during its development. The notion that the Ambulance Service needs to change fundamentally and with it the role and preparation of the paramedic profession has attracted considerable attention, nationally and internationally. Aspects of the study and findings have been presented in the UK, in Europe, in Australia, New Zealand and South Africa. The International Round Table on Community Para-medicine has taken a close interest and there have been a number of in-bound missions to SECAmb, which has remodelled itself around many of the emerging themes.

There remains however, a very large gap in the understanding of policy makers, system leaders, commissioners and researchers in terms of what might be both the ideal preparation for paramedics and how this preparation should be coupled with system designs that are fit for the future. Further research possibly using alternative methodologies are required to address these areas, particularly in terms of optimal clinically effective models of care and the effectiveness of this care from a patient outcome perspective.

IX.15/ Summary

Results have previously been considered in two sections, the first dealing with material that appears in the forms of figures predominantly in graphic histogram or similar form and the second using the Horizon Scanning Template approach. The latter risks being somewhat staccato but follows the conventional approach, which has the advantage of being faithful to the accepted style, while also ensuring completeness. Population demographics are considered, which shows that the background increase in population size is likely to be an important factor in driving demand for ambulance and paramedic services. The downstream effect of this and other variables is considered further in respect of more specific data demonstrating growth trends in emergency call volumes and data from triage systems breaks this demand down into clinical services. Organisational issues, including the changes in the numbers of ambulance services and A&E units are included.

The second part of the results section is elucidated utilising the Horizon Scanning template and introduces the critical notion of paramedics as a 'disruptive technology.' Drawing upon the template a more comprehensive picture of the strengths and state of development of paramedics is created establishing the areas where paramedics can be utilised in ever expanding roles. The ascendancy of paramedics to allied health professional status can be seen as a pivotal point in their development. It can be viewed as a very relevant development that has catalysed a number of important changes in their capabilities, which have been greatly assisted and facilitated by through the nationally agreed JRCALC *Clinical Practice Guidelines* (2013 and earlier

versions). Overall this section of the document provides summary information that helps to create a picture of a ‘product’ that, while still relatively immature, is becoming more capable and relevant over time: this is the very essence of a disruptive technology.

The template, in keeping with convention, explores existing comparators, considering each group in turn. While examples of nursing staff and the potential role of new practitioners do represent potential alternatives to paramedics, medical professionals are defined as the most likely group to compete for the role of paramedics, based on comparison of skill set. An analysis of competencies, by professional group is offered in skill matrix form and this provides for relatively easy comprehensive comparisons at least in terms of the clinical skills that each group can provide. It is apparent that some groups, such as medicine, can deploy a wider range of skills but this is, to a large extent, a product of post-registration education and training. The final area considered in that of cost and a brief cost comparison is presented.

Chapter IX

Discussion

This chapter integrates all previous chapters and seeks to draw relevant findings together within an analytical discussion. It is sequenced into seven phases, starting with a return to the theme of a rapidly changing and evolving context within which this study has been undertaken. It will then consider, relatively briefly, some of the findings from Phase A, particularly in respect of the results dealing with the future educational aspirations of respondents. The narrative then evolves to consider the central role that education appears to play as a catalyst for positive change. The role of paramedics and the potential for other professional groups to take on pre-hospital care will then be discussed, with reference to the results from Phase B of the research.

Particular attention will be given to the paramedic and medical alternatives, scope of practice, the professionalisation of paramedics and their potential as a disruptive technology. The relationship between likely future NHS reconfigurations and the concept of operation of ambulance services and the equally important areas of operational models and workforce implications then follow.

These sections lead to a conclusion, a summary of ‘possible’, ‘probable’ and ‘preferable’ future scenarios, together with a briefly considered ‘wild card,’ albeit less

plausible option for the paramedic profession and for ambulance services, followed by a chapter summary.

IX.1/ Change, the only constant

There has been an unprecedented amount of change to the NHS, the Ambulance Service and the paramedic profession in the few years since this research project was conceived and initiated. It has also become even clearer that the pace of change is going to increase further and the political direction of the Alliance Government, despite internal and external opposition, is going to result in more diversity in provision. The pattern is now set for 'market reforms' that will open the hitherto relatively closed public sector market to an extent that is not yet fully clear. Just how far these changes will go is difficult to predict, but few commentators consider them anything other than heralding large-scale change.

Even well placed commentators such as Lilley (2011), who writes a regular and particularly well-informed column for NHS managers, frequently changes his view as to the extent of any radicalism. He suggested that the need for the incumbent Secretary of State to appear more balanced; combined with Public Finance Initiative (PFI) debt would militate against radical amendment to care pathways or the closure of hospitals. In other postings, Lilley is less sanguine, forecasting wholesale reorganisations that could make the NHS all but unrecognisable to future generations (Institute of Health Service Managers/Roy Lilley blog, 2011).

The symbiotic relationship between the Ambulance Service and the paramedic profession and the more fluid, less ‘estate heavy’ structure of the service, when compared to the acute hospital sector, combined with the less obvious local community ‘anchoring’, may offer less protection from such destabilising effects and increase the level of risk. If alternative models of delivery are proffered from private vendors or hospital-based competitors, the resulting centrifugal forces might also accelerate fragmentation and a possible ‘de-orchestration’ of what, in effect, has been very much a nationally provided, broadly universal level of service, based on local delivery.

Whilst the NHS remains the primary organisation in which most paramedics work, it is in some jeopardy, or at least likely to be subject to significant financial and other pressures. The paramedic profession does, by contrast, have a limited level of protection provided by regulation. The structures defined by the HCPC, mediated predominately through the revised and strengthened [paramedic] Standards of Proficiency (SOP) and the Standards of Education and Training (SET), are not quite as susceptible to external forces such as organisational structures. Both the SOPs and the SETs, enable paramedic practice to evolve in line with patient need or at least hold out the prospect of doing so if fully exploited. The nature of such revisions is something of a paradox as the regulator does not always actively enforce these changes, as highlighted by the crucially important matter of threshold entry level, seemingly choosing to allow a relatively slower consensus building among stakeholders.

Of all the issues explored in the questionnaires, the issue of threshold entry has arguably become the most important, principally because the educational level and the relationship between learning outcomes is such a key ingredient when considering scope of practice. The respondents to the questionnaires were well disposed to increasing the educational level for paramedics and for technicians alike. The latter group is now something of a moot point with the ceasing of IHCD type ambulance technician programmes, which itself demonstrates that without regulation, employers and others have the power to remove an entire grade of clinical staff, with little or no consultation. Respondents were equally positive when it came to the reason for moving from a training approach to one with accredited qualifications and both acknowledged and valued the additional opportunities to enhance patient care that are implicitly associated with such a transition.

During the last few years, it has become increasingly apparent that there may well be other valid reasons to adopt a full BSc level approach for paramedics and that such a move is a logical response to the increasing complexity of the work paramedics are required to undertake. Lester (2009), in considering the situation in relation to health professions, recognises that virtually all groups are based "exclusively on a full-time higher education model" (p. 5) and goes on to assert that the need to "make critical decisions work in a cross functional team", (p. 7) while also functioning with a degree of independence, makes this a logical approach. Half a century ago, when studying a range of professional groups, Millerson (1964) reported the move to graduate status before individuals were considered 'professionally qualified'. By the mid-20th century the notion of what constituted a profession had already broadened from the traditionally accepted group of law, engineering, ministry and university teaching.

More recent researchers claim that the phenomenon of new professions migrating to degree entry routes is related to society's desire to reduce risk (Beck 1992) or obsessions with control and audit (Power, 1997).

Graduate qualified status seemingly provides some level of reassurance to the public and policymakers. Larson (1977) and Marquand (1997) see the link with regulation and accountability and other controls within the community through the application of these enforceable standards. Others regard the move to tertiary education as a logical step, bringing to paramedic practice the generic 'graduate attributes' that are increasingly required by all sections of a modern economy and that would generally be taken for granted in any health care oriented profession (Williams, Onsman, Brown and Williams, 2010). Corner (2011) makes a direct link between graduate status and evidence of improvements in the quality of care, while Redelsteiner (2013) has made similar comments regarding the importance of upgrading the education of paramedics throughout Europe.

Despite seemingly meeting Freidson's (1970) definition of a 'profession', i.e. 'special value work, service to the public, independent practice and expert knowledge', there is still a lack of enthusiasm by NHS employers to adopt wholeheartedly a full degree-bearing approach. However, reservations have lessened recently with a joint approach to the regulator by the CoP and the employers (the rationale for adopting a Diploma/Foundation degree). This has now been accepted, as evidenced in Appendix V, which reproduces a joint letter from the NHS ambulance services and the CoP in support of this change. However, this would still seem to fall short of Goode's (1960) definition (depending on the interpretation as to whether two years

constitutes ‘prolonged’ or not), of a profession, described as a ‘prolonged’ specialised education and a collective approach to social welfare. Furthermore, Foundation degrees are used extensively by assistant practitioner grades, often working in support of allied health professionals. Staff in these roles are expected to work within tightly supervised protocols and procedures and are not considered to have the ability to make clinical judgements beyond these limited clinical roles.

In the main it would appear that there is a case for concluding that at least some of the core attributes of a profession, i.e. altruism, a code of ethics, commitment, knowledge, service, trustworthiness and regulation, have been met. However, McCann, Granter, Hyde, and Hassard (2013) in their paper *Still Blue-Collar after all these Years? An Ethnography of the Professionalization of Emergency Ambulance Work* conclude that, despite the ‘institutional entrepreneurship’ shown by the CoP, paramedics operating at street level are still subject to too many restrictions to have passed the test of a truly autonomous profession.

In attributing reasons why this is the case, three causes are offered. Firstly, the desire of the previous (‘New’) Labour Government of 1997-2009 to promote the role of the AHPs, but to do so within what has been described as a ‘New Public Management (NPM)’ paradigm (Hood 2006), i.e. one heavily controlled via performance regimes, without the degree of professional power available to more established professions. Secondly, a particularly harsh and counter-productive, extreme example of performance management, stifling professional growth typifies work within ambulance services to some degree, as identified by Wankhade (2012). The consequence of focusing heavily on performance has the effect in Wankhade’s

view of ‘goal displacement’ with a lower priority being given to the quality of patient care; a situation clearly at variance with a more professional focus. Thirdly, the fact that the professionalising process arose from ‘above’ in that the driving force for the process did not, at least in the first instance come from within the profession itself, a process termed ‘coercive isomorphism’ by McClelland (1990).

McCann et al (2013) recognise that one of the most effective strategies to address the slow pace of the professionalization of paramedics would be to upgrade educational preparation given that the needs for this are rooted in the needs of the emerging profession and their patients, rather than simply a matter of following the AHPs’ herd. It is important to recognise that other allied health professional groups, except Operating Department Practitioners and paramedics, have now achieved a BSc entry level to the professional register. The case for change, while arguably already strong, needs to include the prime matter of quality and safety and would necessarily take into account any evidence of unfit practice that could be linked to lower educational levels. One of the first major reports to recognise this was the Wells report (1995), which investigated the failings within the London Ambulance Service. Its recommendations included revisions to training and the need for staff able to operate in a more ‘holistic’ manner.

In returning to the findings of the survey in Phase A, it emerged that respondents were strongly in favour of moving to a more educational approach. Given that these responses took place well before widespread changes in preparation had occurred and before the provision of large numbers of HEI programmes, this is both an interesting and surprising finding. Respondents, it appears, were well ahead in their

thinking regarding the role of education. There was also a clear trend to associate the benefits of education with improvements in clinical practice and, with a strong view that any overt pressure from employers would have a negative influence on motivation. The preference for higher level qualifications, Diploma and BSc level is again a somewhat surprising result. A number of other findings, while not directly related to the question of educational levels were also found. There did appear to be a strong link between the levels of satisfaction reported by technicians and the amount of time that they worked with paramedics. This may be an example of the transfer of learning, explored by Thorndike and Woodwarth (1901), a phenomenon also considered by Helfenstein (2005).

Other drivers linked to safety and quality includes the fact that paramedics were over represented in Fitness to Practice cases. In the HCPC (2011) *Fitness to Practice* annual report, the HPC (p. 13) shows that while paramedics are shown to make up only 7.8% of total registrants, they accounted for 24.8% of all fitness to practice cases. Although this is not strictly discernible from the data, there have been regular claims that the majority of incidents involved those who qualified through the vocational paramedic training route.

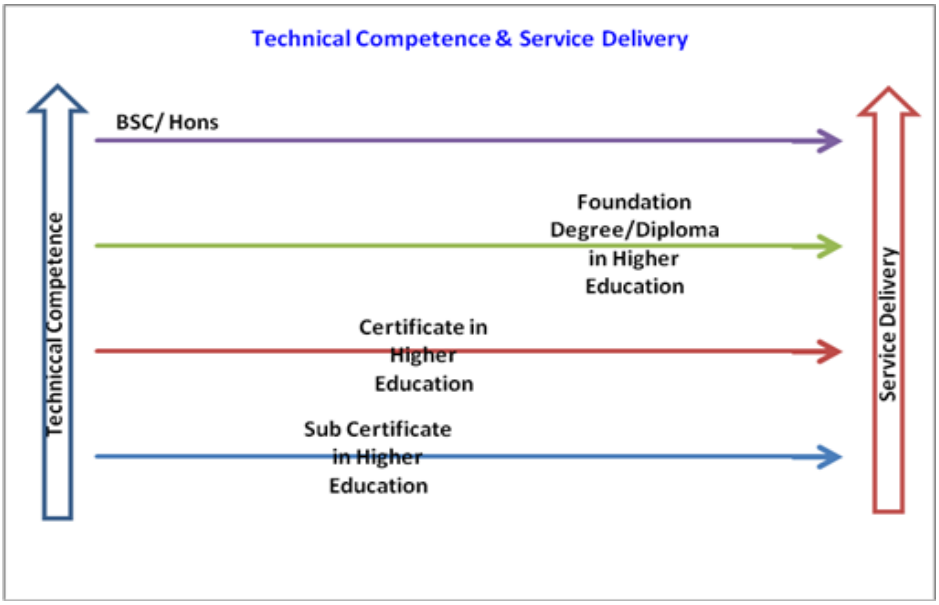

Figure 110: Technical Competence and Service Delivery.

Figure 110 seeks to illustrate the relationship between an increasing level of education and a corresponding increase in technical competence/scope of practice that translates into more capable service delivery.

When considering the route of preparation, respondents tended to be less happy about their preparation in areas such as assessing patients with psychiatric disorders, paediatrics and obstetric cases, but perhaps somewhat paradoxically scored quite highly against their perceived ability to deal with category C patients (frequently, those with undifferentiated, urgent care conditions). From an educational perspective, assessment and diagnostic skills tend to sit at the higher taxonomical level of learning outcomes. There could, therefore, be a mismatch between the perception of paramedics (and technicians) and their actual ability to satisfactorily and, more importantly, safely evaluate which patients did not require hospital attendance. As Gilhooly (1990) and Charlin, Tardif and Boshuizen (2000) note, the prime responsibility in patient assessment is to place a patient accurately along the

‘acuity spectrum’, and this can only be achieved by those with the necessary patient assessment skills, which are themselves a direct function of a detailed education process.

Alternatively, respondents could have been answering from the perspective of reporting a degree of comfort in managing such cases, but with the expectation of transporting them to an A&E department which, as noted in the Bradley report (2005), was generally the default position taken by most ambulance crews prior to 2000. Other commentators suggest that the experience of dealing with large numbers of patients with seemingly minor problems can create ‘blasé’ attitudes among ambulance crews (Woollard, O'Meara and Munro, 2010). Emergency transport rates across English ambulance services were considered in the National Audit Office (2011) report, *Transforming NHS Ambulance Services* and have moved up the attention scale of ambulance commissioners. The opportunity to reduce the number of transportations of emergency ambulance patients is therefore likely to become an ever more important metric.

As noted in the literature review it emerged that literature from the United States has repeatedly found that Emergency Medical Technicians (a term that can mean ambulance technicians or paramedics, depending on grade) often under-assess patients, (Bissell et al. 1999, Schmidt et al. 2001, Hauswald 2002 and Silvestri et al. 2002). Studies seeking to elucidate what constitutes safe pre-hospital triage practice are also not without their methodological difficulties as Couchman and Dawson (1995) noted, raising the question: Are the measuring tools trying to ‘measure what you think you are measuring? One practical example of the sort of difficulties raised

is the interpretation of the use, and consequences of, diagnostic monitoring. For example, does such use automatically indicate a need for transportation?

The interplay with local policies and procedures could be a factor here, and transatlantic research is not always applicable in a UK context, but as Snooks et al (2002) note, the problems experienced by both UK and US ambulance services are remarkably similar. Some of the proposed solutions are also common, such as devising specific programmes to meet the need of elderly fallers as described by Dixon, Mason, Knowles, Colwell, Wardrope, Snooks, et al (2010). Nevertheless, the issue of patient safety is paramount, particularly so, when allied health professionals are required to be able to assess, treat and refer within their regular practice and sign up to this effect every time they register or renew their registration. Again, this is something of a discontinuity because while most allied health professionals are required to function in this way, few operate with the limited level of senior supervision as is found in the Ambulance Service setting, and fewer still see and discharge patients regularly at 'level five' of the NHS career framework, the entry level for AHP registration. Increasingly, newly qualified allied health professionals and other health professionals are recognised as not being fully prepared for their roles and thereby needing a structured period of enhanced support when they enter the labour force service.

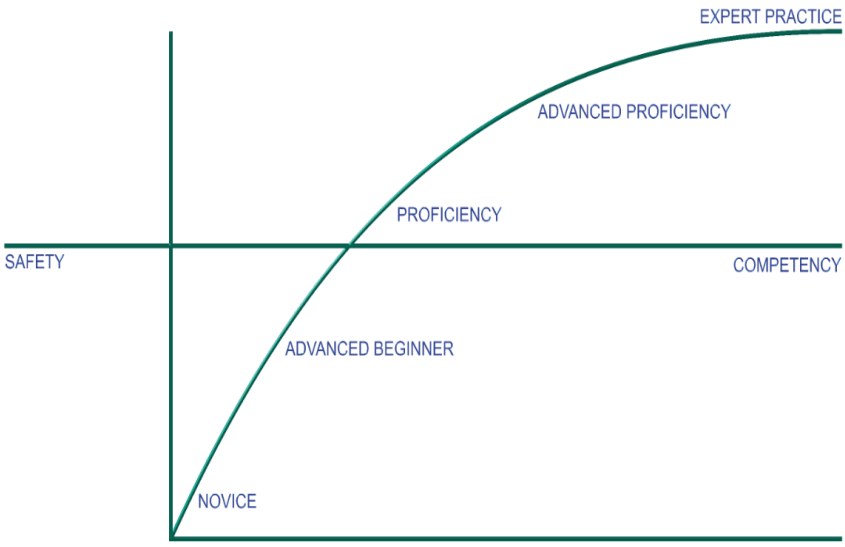

Figure 111: From Novice to Expert Practitioner.

Figure 111, adapted from a conference presentation given by Curran (2011) is seemingly based on the work of Benner's (1984) 'novice to expert' whilst emphasising the need to ensure competency among new practitioners, but also implying that this process requires an extended period of education and training to ensure safety and proficiency.

An example of how this is being officially recognised is the NHS Flying Start preceptorship programme that is now being gradually introduced. Without this support, paramedics are potentially doubly disadvantaged when undertaking programmes below degree level and hence without learning outcomes developed at level 5 and without a structured period where their practice is developed within a protected space. In contrast, Woollard (2007) has shown that experienced paramedics, (Paramedic Practitioners) operating at level 6 and above of the paramedic career framework, can safely reduce admission rates.

Other subtle factors may also be at work here in that there has been an almost traditional, and in some cases dominant, view that much of the demand being placed upon ambulance services constitutes nothing short of an abuse of the system. This view might be influencing respondents who could under appreciate the potential severity of some patient presentation that lacks an obvious immediate clinical need, i.e. the ability to benefit from what the ambulance service/paramedics have to offer. Some ambulance trusts have gone as far as adorning their ambulances with public information posters discouraging the use of the service, except in life-threatening emergencies. Several authors have studied this phenomenon and many contributing factors have been suggested, particularly in respect of the ageing population, social isolation, system changes in the provision of primary care and the expectations of society, which has become conditioned to 'instant' or at least 24/7 services (Mann and Guly, 1998).

It is however, hardly a new phenomenon, as Hadfield (1903) commented when studying the Liverpool horse-drawn ambulance service:

> "There can be little doubt in the mind of an independent observer that a considerable proportion of those carried in ambulances get there, either directly or indirectly through the abuse of drink. Either their own bad habits have been the cause of injury, or they have been the victims of the drunken violence of others" (p 342).

He also noted the small number of 'chronic malingerers' encountered, but philosophically accepted that "a proportion of such cases was inevitable and a by-product of the duty that the State or municipality [has] to assist the accidentally

injured, and the victims of sudden illness [in order] to save life". Considering that his paper was written 48 years before the advent of the NHS, his words are incredibly prescient and his approach wholly pragmatic.

In more recent research, Palazzo, Warner, Harron and Morrison (1998) after studying 300 consecutive arrivals by ambulance at a London Emergency Department, considered that 16% of patients were deemed to be 'inappropriate attenders', as judged by the ambulance crew, the first doctors to see the patient (typically a junior member of the medical staff) and then by a consultant in a retrospective review. The criterion for assessing need seems very much a question of benefiting purely in clinical terms. Investigating a little deeper, Saunders (2000) investigated the attitudes of patients and discovered that many people considered uncertainty regarding the nature and severity of their symptoms to be the prime reason for seeking early emergency NHS care. Volans (1998) identified 'well meaning' bystanders, as a particular causative factor in summoning ambulances and concluded that public education was unlikely to be particularly effective in ameliorating the matter.

There certainly does appear to be a mismatch in skills and a tendency to default to transport when ambulance crews attend patients, but this does not necessarily imply fecklessness by the public. Any problem of appropriateness is more likely to be at least partly related to the health-care system itself, either through accessibility issues, the appropriateness of the response, or the training and education level of the ambulance crew, if indeed the request comes to the Ambulance Service rather than to the potentially confusing range of other providers first.

Deficiencies in the IHCD based training of paramedics have been considered, both from the perspective of the providers and other commentators and there is a coherence of view. Lendraum, Wilson and Cooke (2000) conducted a study to determine whether conventional vocational preparation matched the actual workload that paramedics dealt with. His findings were forceful, concluding in large part that they did not meet the reality of patient need, stating that there was 'no published evidence that ambulance personnel are trained appropriately for their role' (p.3). Kilner's (2004), criticisms went even further, declaring that the [IHCD] course was out of phase both with patient and professional needs, stating that; "It is entirely possible that the curriculum is defining the occupational group [paramedics] rather than the desirable attributes being used to define the curriculum." Wood (2000) raises a pithy question when quoting the JRCALC (2000) paper's observation; "If [IHCD] paramedic training does not provide the underpinning education for sound clinical judgement to be exercised or indeed expected" (JRCALC 2000, p. 3) "why is it to be continued?" (Wood, 2000, p.135) In summarising the situation later that year Cooper (2004) concluded that ambulance services and paramedics were at a transient state, with "significant organisational, professional and cultural challenges" (p.375). Much the same could indeed be said in 2013.

Perhaps surprisingly, none of these papers considered some of the broader, but important factors, such as why there was no career structure at that time, which could have militated in favour creating more senior paramedics, within the context of further clinical development. Nor was there any recognition that the system that paramedics work within, is at least as important as their personal preparation with more senior staff supporting decision-making and other clinical governance arrangements that

would be routine in other professions remained largely absent in the paramedic ‘world’, a point noted earlier in the study by McCann et al (2013).

However, it is highly possible that any analysis, if applied to medical or indeed nursing and other clinical staff, might well have found that doctors and others, who complete their basic clinical education are also not fully fit to provide the totality of services needed by patients. Instead, they develop into this role over time, at great expense and with a hierarchy of clinical support. It is likely, therefore, that paramedics would need a similar structure and environment to reach their potential and to more fully meet the needs of the community.

The situation regarding paramedics has usually been very different to that of medicine. Despite the presence of a national training curriculum, Simpson and Smith (1996) found considerable differences in the range of skills practiced and Hassan and Barnett (2002) determined that continuing education was often lacking. These deficiencies help make the case for the move to higher education, a strong professional body to act as the guardian of the distinct body of knowledge, a fully embedded career structure and an overall more professionally eclectic approach. The journey to achieving these important elements is now well under way, but there remains the issue of whether even universal undergraduate preparation would be sufficient to enable paramedics to achieve the best outcomes for the most seriously ill and injured, hence the need for development opportunities matching patient needs at the post-registration level.

When a comparison with medicine and nursing are made, it is clear that the responsibilities assigned to these workers increase with experience, as indeed

occurs in most industries and professions, in line with established career frameworks. This has not hitherto been the case with paramedics who have been considered generalists and who, rather like the ‘next cab on the rank’ will often be assigned to the next [sometimes waiting] incident on the basis of proximity, not skills level or experience. This largely unthinking and illogical approach is no longer necessary with the advent of triage systems and selective tasking, but was the norm for many years prior to the late 1990s. Once again, the relationship between organisational arrangements, working routines, procedure and cultural factors combine to militate in favour of good or bad practice, with an end point in patient experience and outcome.

It seems clear from the data generated by the respondents themselves that there is a well-developed understanding, arguably amounting to a majority view, that the education level for paramedics, in particular, should be set at an academic level, Diploma, Foundation Degree or above with a small preference for degree level. DH policy supports this view, as articulated in *Taking Health Care to the Patient,* but the majority of employers have yet to catch up as the seeming mismatch between both the training and education level of paramedics and the work they are called upon to undertake, becomes ever more stark.

Nevertheless, it is hardly unreasonable that some degree of anxiety in relation to a move to degree status should exist and this was certainly the case within nursing, as Mangan (1993) reported. In the same article Mangan states:

> “The answer to the question of whether nursing would be better served if it were to become a graduate profession must be a conditional “yes”. The

condition is that the degree should be relevant both to nursing and, more specifically, to the development of clinical practice" (p 52)

It seems reasonable to apply similar caveats to paramedic degree aspirations and indeed American paramedic educators, such as Polk and Langford (1993) who, in the same year, articulated similar concerns, stating that [paramedic] "Bachelor's degree programmes are working to change the management of crisis philosophy that is typical in EMS operations…" (p.70) and went on to say that, without a degree level education, areas such as patient assessment, pathophysiology and pharmacology would be understated

Regrettably, the organisational form of the Ambulance Service has not adapted to this change and remains confused as to whether patients calling with non-life-threatening conditions are worthy or simply something of a nuisance. It is almost as if Larrey's 18th Century doctrine, which did so much to revolutionise the care of the wounded and sick, first in military and later civilian practice, continues to exert an effect on those who lead and provide ambulance services today, thus blinding policymakers and providers to the reality of 21st century demand, which has changed radically. What has been considered to be 'bread and butter' ambulance work, termed by the European Resuscitation Council the 'first hour' quintet of acute cardiac conditions [chest pain and cardiac arrest], stroke, acute breathlessness and major trauma', is less common today.

These and other truly life-threatening conditions no longer represent the core demand for most ambulance services in the developed world, accounting for less than 10 per cent of typical workload. This phenomenon is gradually being

recognised in the UK (Martin and Swineburn, 2012) and abroad and the acuity of patients does appear to be changing and reducing rapidly, as a recent detailed study from New York showed (Munjal et al 2011). Lowthian et al. (2011) in Australia noted an increase in ambulance transports involving the elderly. Nevertheless, emergency ambulance providers have been slow to react systematically and appear to struggle with defining what appropriate emergency ambulance care actually is (Judge, 2004).

Snooks et al (1998) undertook a literature review focusing upon the use of the 999 ambulance service and showed some appreciation of the wider issues, suggesting that services should worry less about 'appropriateness' and devote more effort to providing appropriate care. The advice, for the most part, was not heeded or at least the complex interplay between the various issues appears to have been under appreciated. Most of the ingredients for a successful ambulance service operating with well-prepared and effective [in terms of meeting patient need] paramedics, are available, but not deployed in a coherent manner. Key elements, such as ensuring adequate levels of education that guarantee that students can meet appropriate learning objectives to enable suitable levels of patient assessment, continue to be debated. The very concept of operation of the Ambulance Service and its role in respect of those who are not at 'death's door' is unclear and confused. Essentially, this is a leadership and communication problem, compounded by a lack of clear doctrine and purpose.

IX.2/ The Coveted Role of the Paramedic

The role of the paramedic, successor to the lowly ambulance driver of less than 40 years ago, appears to have become ‘sexy’, sought after and attractive to many seeking a career in health care and, for some established professions, even coveted in a manner difficult to conceive even ten years ago. It is as if a peripheral patch of territory, once ignored and relatively valueless, has been found to contain previously unappreciated riches. Ambulance work has certainly become considerably more visible and attractive to other health care workers as illustrated previously. The medical profession, in what could almost be described as an hegemonistic approach and to a much lesser extent, the nursing profession, have started to expand into occupational space, formerly occupied by the Ambulance Service, ambulance workers and, more specifically, paramedics whom they had previously largely ignored.

This has been a professionally led [by the medical profession] rather than a policy-led desire to extend the role of medicine through the medium of a new sub-speciality, in a matter that has not been promoted by the DH, the Ambulance Service, paramedics or others. Unsurprisingly, this move was not widely anticipated, although indications and ‘signals’ have been present for decades. The act of paramedic registration and the potential danger of ‘tribal warfare’ were foreseen by Roberts (1993), a former Chief Ambulance Advisor to the DH, although his concerns centred more on potential frictions with the nursing profession, and have generally not materialised. His suggestion was that, in order to avoid conflict it might be more sensible to

standardise on a nursing model and produce a post-registration module in emergency care or a ‘generic emergency care worker’. The article suggests that the RCN was considering the role of nursing in this context and indeed, it is a solution that was introduced into the Swedish health system (Suserud, 2005) and is also well established in the Netherlands (Gras, 2011). It is open to question just how such an approach would have worked in the UK and the notion of ‘generic health-care workers’ or ‘ a unified health professionals course’ which crops up from time to time (Gunterstone, 2002). But at the time of publication there were still opportunities to embrace the idea, which possibly might have worked.

In the event, the concept was not developed and the registration of paramedics went ahead seven years later. There would seem little logic in pursuing a nurse-based staffing model now, given that nurse education is not designed to prepare newly qualified nurses to operate in an ambulance environment. Expensive conversion training would therefore be required, as is the case in Sweden and the Netherlands. The use of nurses in these two countries occurred due to their relatively small population size, and they never developed the range of AHPs, , as is common in countries such as the UK. Perhaps an even more pressing concern is the relative shortage of nurses that is predicted to worsen, with regular, almost alarmist articles such as ‘NHS faces a nursing shortage’ (Lintern, 2012).

Returning to the theme of new practitioners, during 2002 there was a move to develop a completely new professional group to duplicate some of the roles of a paramedic, a considerable part of the work of a specialist paramedic and, to some extent, areas of practice within the domain of advanced nurse specialists. This was

ostensively to meet the needs of the increasing number of patients with 'undifferentiated' primary care needs. The proposal was sponsored by the Modernisation Agency, but this organisation has now receded into NHS history. However, the ECP was one of this Agency's projects, inspired by the PEC, as originated by JRCALC and was an attempt to create a generic primary and emergency care type practitioner. Recruited from both paramedics and nurses, and theoretically other groups, in practice this proved to be difficult. This initiative conflicted directly with the paramedic benchmark statement and the paramedic career structure, a fact that was overlooked by the MA. Although the threats associated with this development have reduced to a considerable degree, it represented a prime example of interference in the development of the paramedic profession and occurred due to what appears to be a misunderstanding over the role, duties and potential of paramedics. It also directly challenged a cornerstone of paramedic registration and the matter of title, in that paramedics operating in the role were no longer recognisable as HPC/HCPC registrants. The regulatory preference is to retain the primary title, not substitute alternative nomenclature as this would both conflict with the regulatory rules and cause confusion in the minds of the public (*Taking Health Care to the Patient 2*, p. 26).

The advent of new practitioners did not conflict with medical student numbers; indeed there has been a large increase over the last decade. In contrast nurse education commissions are falling slightly [as of April 2011] and the Royal College of Nursing has been running an active campaign seeking to emphasise that job losses among nurses are a factual consequence of the financial draw down and the need to reduce NHS spending, as promulgated by the NHS CE, David Nicholson. In terms of other

relevant professional development that parallel medical interest in duplicating to some degree existing AHPs' capabilities, there is the recent example of the emergence of 'sports medicine' as a medical sub-speciality, again indicating the expansionist tendency of the medical profession and sparking an understandably negative reaction by physiotherapists who objected to the apparent duplication of at least some of the work they were already undertaking. No similar developments have taken place within the nursing profession, which is perhaps surprising, notwithstanding the limited employment of nurses working to the paramedic job description in one Trust, as identified in the Horizon Scanning results section

Several related examples of the trend encouraging different professional groups to compete for the same occupational space, have been offered in earlier chapters of this thesis and much of the literature remains in the form of 'grey' documentation, reports and similar. But an increasing amount of information has been published recently, most notably with the work of the inter-collegiate board's submission to the GMC and the subsequent authorisation of 'pre-hospital care' as a sub-speciality of medicine (July 2011). The sub-speciality "relates to that area of medical care required for seriously ill or injured patients before they reach hospital" (p. 6). Formalising a paid branch of medicine that in some cases was previously provided voluntarily through the largely unpaid work of charitable enthusiasts on a 'hobby based' approach moves almost effortlessly [and certainly without any policy support or options appraisal] to a salaried activity. Such an approach was questioned by Cooke (1994) in his article: *Immediate medical care: speciality or pastime?*

Freidson (1986) a leading academic analyst studying medical power and its impact on other clinical groups has described how the technique of ‘restratification’ has been used by the medical profession to exploit their dominant position over other professional groups. In contrast some researchers conclude that medical power is diminishing, such as Coburn, Rappolt and Bourgeault (1997) who detect a weakening medical position, reflecting the Freidson continuum of ‘dominance, autonomy and subordination’ and suggest that the focus has moved from subordination to autonomy. Annandale (1988) uses midwifery as an example of this preposition, whereas Freidson rejects this notion. Mckinlay (1973) concurring with Freidson, rejects a ‘proletarianisation’ or the curbing and downgrading of medicine and agrees that medical power is at the very least, stable and possibly increasing.

The precise situation is difficult to judge in that it affects the move into the space previously provided by paramedics and to an extent by some voluntary, unpaid medical staff. While much of Freidson’s work relates to North America the lessons appear to be equally relevant to the UK setting and there is no doubt that medical power is being leveraged to enter the ‘pre-hospital market’ and to do so on a paid, rather than a voluntary basis. While medicine has little difficulty in making the case that it is a fully mature core profession, the status of other allied health professionals and nurses, must, at least in the eyes of many of the public and policy makers have a lesser claim, a fact that may have implications when operating in a market place environment.

There is certainly a strong trend towards professionalisation and professionalism, notwithstanding the previously cited limitations imposed on the AHPs by the NPM

agenda of the previous government. The earlier title; Professions Allied to Medicine (PAMs), was replaced in 2003 by the term AHPs, although some commentators, such as (Scott 2008) suggests that these groups rather than being 'lords of the dance and calling the tune' are all relatively weak in terms of their professional power. In comparison both medicine and perhaps nursing are much stronger, but this does not mean that they evaded criticism for public failings of professionalism, as indicated in the recent Francis report (2013). Recent 'notes of censure' include the 2012 Commission on *Improving Dignity in Care for Older People*, the Mid Staffordshire report (2013) and the earlier Bristol Royal Infirmary report (2001).

Responsibilities and duties for any of these groups can move, expand and contract, although the former is more likely in most cases. This was recognised by Armstrong (1976) and the issue of boundary encroachment considered in the context of pharmacists by Mesler (2008) and Eaton and Webb (2008), which confirms that 'expansion', 'encroachment' or 'development' can work in a number of directions, either for or against a particular professional group. With professionalisation and regulation comes a certain level of power. The balance between individual professional groups and medicine differs, with pharmacists and nurses clearly consolidating control over their activities to an arguably much greater degree than most allied health professionals. Questions for paramedics include: Where is that balance today? How will increasing medical interest in pre-hospital work play out? What lesson can be learnt from more medic-centric systems in the EU and beyond?

The EU, in marked contrast to the English speaking world and, to an extent, Scandinavia, operates a much more medically-staffed model of pre-hospital care

delivery on the pattern established in certain European States such as Germany, Austria and France. These precedents are explored in the World Health Organization (WHO) and report of an assessment project (2002), *Emergency Medical Service System in the European Union*. The aim of this study is described as 'improving member states' understanding of EMS structures and organisational arrangements', its frame of reference, however, is distinctly medical-centric.

While no comparable WHO reports appear to have been published in relation to other areas of the world, the document gives a strong flavour of medical influence and opinion, with a distinctly European [particularly FGM] bias, but with very little acknowledgement of the paramedic role. It does recognise the role, competencies and educational requirements of nurses, paramedics and technicians are substantially different across countries, to the extent that achieving standardisation and quality improvement are unrealistic goals at the present moment. This appears slightly defeatist, but, to be fair, is echoed by the NHS Confederation European Office briefing on *Mobility of health professions across Europe* (2012). Essentially, the mobility of health care staff in Europe is, at least in terms of specific directives, confined to doctors, dentists, pharmacists, nurses and midwives with no current plans to extend to other health professions. It also places EMS (notably not ambulance services) within the sphere of public health, although assigns the medical leadership role to Emergency Medicine, while again acknowledging that there is no such uniform speciality at the EU level. Other commentators, commonly North American, view EMS as operating at the intersection of public health and public safety, a point made by the National Highways and Traffic Administration, NHTA in their 'Public Health and EMS: Intersections, Overlaps and Opportunities' (2005) publication.

Significantly, for any consideration of the UK context, the WHO report makes claims that appear to exceed the available evidence contained within the publication or elsewhere. However, the report is very much in tune with other medical advocates in stating that 'the practice of Emergency Medicine encompasses the pre-hospital setting. It includes involvement in the development of pre-hospital Emergency Medical Systems'. In support of this contention, it offers a reference to the European Society for Emergency Medicine (EUSEM).

This publication reflects a number of others authored by advocates of the Franco-German model, including Beaulieu and Vilain (1992) whose review claimed that there was a pressing need for the UK to adopt the French SAMU system, a position supported by Parent, Desfemmes and Dufeu (1982) who make the interesting point that the decision to 'medicalise' (p.93) First Aid (ambulance) services in France was made in 1972 (presumably by the French Medical Profession) although the basis for the decision is not fully elucidated. One dissenting voice is Westaby (1989) who, after conducting a review of trauma care in a number of countries including France, Belgium and Russia, for his book *Trauma Pathogenesis and Treatment*, drew a different conclusion when he stated that 'it is extremely unlikely that the status of the attendants has an important bearing on the outcome [pre-hospitally]. What is more important is the training, organisation and speed of response of the service' (p. 5).

Other commentators go so far as to question the value of on-scene care; in an editorial entitled '*How much to do at the accident scene? Spend time on essentials and save lives'* Cooke (1999, p.1150) asserts that preventable deaths in pre-hospital care are rarely due to unavailability of advanced techniques but more often to failure

to treat airway, breathing and circulation (ABC). ALS in the context of major trauma has indeed been questioned with perhaps the largest study, Ontario Pre-hospital Advanced Life Support (OPAL) in Canada finding a higher mortality in the medically treated group of patients, and ambulance technicians the lowest [the mortality of patients treated by paramedics was lower than doctors, but higher than technicians]. However, Cooke does acknowledge that graduate paramedic courses are more readily available and intimates that these might be of value, by raising the standard of patient assessment and decision making.

The Kings Fund report (1992), *Too Many Cooks* by New, advocated a similar line, when examining the overprovision of medical staff at two major incidents, i.e. the Purley and Cannon Street railway accidents, taking the view that 'paramedics may be able to fulfil many of the immediate care procedures currently undertaken by medical teams' (p. 32).

It is a view that has been quite widely shared by some major authorities such as Professor Norman McSwain, one of the architects of the US trauma systems. In his article, *Usefulness of physicians functioning as emergency medical technicians*, he commented on the Sampalis studies [listed as Liberman et al (2000) in the reference section] which compared the AAM and the FGM in Canada, [where the French speaking part of the country retains the FGM], and took a forceful line, stating:

> "Sampalis et al have demonstrated that scene time is prolonged when physicians are present and take an active role in patient care … This [Sampalis] paper is a landmark article because it should finally bring to rest the question of the usefulness of physicians given routine field

trauma care when well-trained emergency medical technicians are available" (p 1027).

The mixed economy of an AAM and FGM remain in use in Canada today and the question of delay was at the centre of criticism of the handling of Princess Diana's fatal road traffic accident in Paris. Other authorities have reached similar conclusions, including Trunkey's *The Medical World is too Flat* (2008), Bolker, Bakke and Christensen (2009) who found that physicians do not improve patient survival, Aspelin, Blom, Wuopio and Ivarsson (2007) who found they increase mortality and Lerner, Maio, Garrison, Spaite and Nichol (1998), who considered the economic implication of system design. In an attempt to resolve the ambiguity, Butler, working with the UK's National Director of Trauma, Professor Willett, reviewed the nature of the evidence again. They concluded that "the literature therefore suggests that ALS provided by physicians serves no additional benefits in the urban setting …" (p 699). On the same page, the authors acknowledge that this might be different in a rural setting and cite the Messick, Rutledge and Meyer (1990) study that showed improved patient survival in a rural setting when treated by paramedics.

The authors went on to make the very important observation that presence or absence of advanced airway skills are potentially of great importance: "An important distinction must be drawn between the presence of a physician and the ability to manage an airway to a high standard (i.e. intubation and ventilation management capable)" (p. 699). The paper acknowledged that the Helicopter Emergency Medical Services (HEMS) operations do enable a small number of staff to gain frequent exposure to the most seriously injured patients, thereby ensuring that skills such as

endotracheal intubation are practiced regularly. The document cites a number of papers from around the world where this capability is provided successfully by both physicians and paramedics.

It is also the case that even in the context of military medical services, these divisions and controversies exist, with the US medical services offering a paramedic-based system and many British military personalities expressing their belief in the physician-based MERT or Medical Emergency Response Team-Enhanced (MERT-E) (Hodgetts & Mahoney, 2009). Influential authorities have been quick to extrapolate implied benefits to civilian practice Porter and Greaves (2009) for example, suggesting that MERT and MERT-E are commendable 'drivers for change' and suggest that 'doctor led pre-hospital care improves mortality'.

Few papers attempt to consider the range of competencies and make the assumption that certain procedures and drugs are restricted to medical officers. Even within the British Military Medical Services there appears to be a difference of opinion, with Davis, Rickards and Ollerton (2007) chastising the RAF for being influenced by US military experience of employing Emergency Medical Technicians as Flight medics, an observation that is used as evidence to support the inferiority of the RAF model of a conjoint Flight Nurse and Flight Paramedic aeromedical teams. He further invokes the widely held misunderstanding that only medically qualified staff are capable of certain procedures, stating that the value of a doctor is based upon a unique ability to provide Rapid Sequence Induction (RSI) anaesthesia.

Kehoe et al (2011) amplify this position, returning to a common theme where they emphasise that effective pre-hospital anaesthesia appears to be a defining difference

between paramedic practice and doctor delivered pre-hospital care. This statement promotes the implicitly held belief that UK paramedics should not include this technique, which is widely used elsewhere by paramedics and also ignores the fact that even in developed countries like the United States, nurse anaesthetists represent approximately 50% of the anaesthetic workforce according to the American Association of Nurse Anaesthetists (2012), a situation unlikely to be very different in much of the EU and certainly lower than in the developing world.

Advanced airway management of this kind is, therefore, something of a signature technique offered by its medical propionates as solely medically provided skills. Cowan, Burton and Newton (2012) invoke recommendations from the anaesthetists of Great Britain and Ireland and reinforce the point that airway management, utilising medications to facilitate the technique of intubation, is a medical procedure. Responding to this theme, they go on to claim that "the UK is still lagging behind many other countries with regard to physician delivered pre-hospital care …" (p. 138). However, this view is not held universally, given the comment by Spencer, Bleetman and Hopkins (2008) citing UK experience when he states: "Our experience supports the growing recognition that appropriately trained non-anaesthetists can perform RSI as safely as anaesthetists in both the hospital and pre-hospital environments. Our study also suggests that with appropriate training and supervision, paramedics carry no greater risks in RSI than their anaesthetic and non-anaesthetic medical colleagues" (p.17). Yet despite ample evidence that paramedics are able to deploy these skills, many contemporary medical commentators continue to hold to the view expressed by Dalton et al. (1992) who, with reference to a series of patients treated by London HEMS, states" "Sixty-eight patients required treatment or procedures

beyond the current training of the ambulance paramedic in the United Kingdom" (p. 249).

Further evidence from the conflict in Afghanistan, (Morrison 2013) reports a comparison between UK and US 'en-route care,' i.e. during air transport from the battlefield. This data showed no difference in patient outcome for patients with an injury severity score (ISS) of 1-15 or those with the most severe injuries of 15-75. It did however show an improvement for those patients with an ISS in the mid severity range of 16-50. The paper speculates that the improvement in survival accrues from what is termed Advanced Medical Retrieval (AMR) capability which, once again, seems to revolve around specific interventions such as advanced airway management and, interestingly, shorter times to definitive surgery, e.g. once the aircraft had landed at the base hospital.

On one level it could be argued that the paper compares 'apples with oranges' in that the physicians were contrasted with paramedics and Emergency Medical Technicians (EMTs) (similar to ambulance technicians without ALS skills). When Mabry, Apodaca and Penrod (2012) compared survival rates between critical care trained flight paramedics, standard paramedic and EMT care, in Afghanistan the previous year, he also reported an improved survival rate (48%) in those patients treated by the Critical Care Flight Paramedics (CCFPs), who appeared to have a similar scope of practice to the UK MERT medical staff. Rortgen et al's (2013) recent German study sought to address the question of comparisons of physician and paramedic effectiveness using simulated scenarios and direction-using telemedicine. The conclusion of this work was that "telemedically-assisted

paramedic care was feasible and at least not inferior compared to standard EMS teams with a physician on-scene in these scenarios" (p 85).

Reinforcing the wider medico-centric view, Dick (2003) stridently challenges the notion that the FGM is in any way inferior to the AAM and it probably is not in most cases, the more likely scenario being that they are fairly equally balanced. His rebuttal specifically addresses the contention that mortality for trauma cases is likely to be higher in physician-treated patients (>14% FGM vs ≤ 5% AAM as reported by Liberman et al (2000). The accusation that scene times are often higher when using physicians is also rejected, citing the Spaite, Criss, Valenzuela and Meislin (1998) finding, suggesting that only 15% of total scene time is absorbed by direct patient care, although this result was obtained in an AAM service. Dick concludes that the only real difference between the FGM/AAM is the greater number of doctors in the FGM model.

Dick goes on to assert and assume that the AAM approach would actually require a similar number of emergency physicians to the FGM model although these would be based in hospital emergency departments. This really is a supposition too far and does not accord with the situation in the UK. Dick makes a plea for a comparative analysis of the two models, as indeed was published in the same year by the previously cited Fischer et al (2003) paper that compared a German and UK ambulance service. This publication failed to detect any significant differences between the two models.

To make sense of the evidence, whether in relation to the effectiveness of pre-hospital care generally or the relative merits of doctors and paramedics employed in

the pre-hospital environment, and divorce such evidence from the increasingly toxic politics, is problematic. Even if this can be achieved, attempting to factor in the wide variety of operational models, geography and cultural difference in system design that may all account for the remarkable variation of finding, is, as Lord (1998) observes, far from straightforward. Callaham (1997) reviewed the situation in an article: *Quantifying the scanty science of pre-hospital emergency care.* He suggested that there was a veritable scientific vacuum when it comes to high quality EMS evaluations, with only RCTs published at that time.

Others, including Neely, Drake and Moorhead (1997) and Spaite et al (1998), have made similar points and advanced the case for a more intensive research effort, although the situation regarding a research focus for the Ambulance Service has improved recently. The establishment of a national research group and a comprehensive assessment of research priorities in the UK: *Building the evidence base in pre-hospital urgent and emergency care*, produced on behalf of the DH by the Medical Care Research Unit in Sheffield (2009) aims to go some way towards filling in the research gap. The document is a useful contribution, but does not delve as deeply into the clinical issues as the American statement: *EMS Makes a Difference: Improved clinical outcomes and downstream healthcare savings* – published by the National EMS Advisory Council (2009).

This publication contains 143 citations, the majority being peer reviewed papers that indicate the value of EMS on the Anglo-American pattern. It is an important contribution, because it represents one of the few occasions where the actual health gain derived from ambulance services has been quantified by specific patient groups,

thereby probably increasing its reliability as a reference source. It concludes that EMS can make a difference in ten ways:

1) by providing a clinically meaningful reduction in time to definitive treatment for STEMI;
2) by decreasing the time to CPR and defibrillation;
3) in stroke care;
4) improving survival for patients with respiratory emergencies;
5) through the availability of advanced patient assessment and diagnostics;
6) in diabetic patients, through clinical care and removing the need for automatic hospital referral;
7) by ceasing to transport futile cases of cardiac arrest, downstream system cost savings can be made, while also lessening the risks to staff and the public from unnecessary emergency transports;
8) through offering clinically suitable referral options to patients who do not require emergency department treatment;
9) through the use of networks, such as trauma systems;
10) through the aggressive treatment of shock in paediatric patients.

The Horizon Scanning section developed the theme for other clinical conditions not covered in the above document, thereby illustrating that the true picture is likely to be more positive and broader than the initial work suggests.

Nevertheless, there is clearly a degree of cynicism in some quarters that echoes the clear frustration of some such as Pepe, Marni and Bonnin (1989) who suggested that "Many large EMS systems have become expensive medical taxi services, elaborately dressed in all the right medical trappings, but often unable to demonstrate clear public satisfaction, let alone a lifesaving effect" (Pepe et al 1989). Pepe went on to serve as Medical Director to many large American EMS systems. Callaham (1997) has gone as far as to suggest that even promoting EMS/ambulance services, as primarily lifesaving operations creates 'unrealistic expectations' and also noted that there has been too great a focus on cardiac arrest and major trauma, whereas a more balanced approach might include reassurance of patients and relieving pain and distress.

These beliefs do have certain logic, but fail to fully consider the organisational and clinical benefits that can be greater than the sum of their parts, and create real added value for patients. This is now beginning to be more widely appreciated. Two widely different papers exemplify this trend. Argent (2010) advances the case of obstetric networks, similar to the pattern of those established for the care of patients suffering MI. The power of coupling the concept of a network, allowing more permissive destination decisions by paramedics and ensuring that certain clinical actions occur in the pre-hospital environment, again increases the power of paramedics and others to improve patients' outcomes as explored by the US Department of Transportation's *Emergency Medical Services Outcome Evaluation* report (2003). Myers et al (2008) has demonstrated just how powerful a tool can be provided with such an approach and also offers a clear-sighted method for evaluating the effect on patient outcome in terms of NNT (a summary of this approach is contained within Chapter VIII table 19).

One part of the world, Scandinavia, has quietly retreated from utilising doctors in the pre-hospital setting in Sweden and Denmark. Sweden migrated to a nurse-based system, operating with crews of two registered nurses, at least one of whom would have specialist qualifications and a scope of practice similar to a US/UK/Australian paramedic. Two detailed reports were commissioned and the conclusions were unequivocal:

"To bring doctors' competence into the pre-hospital environment is not an automatic guarantee of increased quality. The service is also an underused resource; it is by definition not cost effective.

After the medical evaluation was performed in November 2007 all doctors' [response] cars were withdrawn at the end of 2008."

Translated from the Swedish report*, Prehospitalt läkarstöd i akutsjukvården Skåne - En medicinsk utvärdering* (Brissmar B, Regional Council of Scania, Sweden; 2007),

Notwithstanding the slightly awkward 'Google translate' derived text above, the overall opinion of the author appears clear and has been translated in to practice, leading to a withdrawal of medical staffing from much of pre-hospital care in Sweden. A recent and quite similar study, '*Rapid Evidence Review'* by Robertson, Roberts, Emerson, Turner and Greig (2011) considered much of the same ground, but this time in relation to the Zealand region of Denmark. The review question was: What is the association between pre-hospital provider service personnel's education (Managing Director, nurse, paramedic, ambulance technician, advanced first-aid

training for laymen etc.) and training and the impact on outcome for patients? The findings consider similar conclusions to the Swedish Report.

The evidence as to the type of health care professional required for optimal pre-hospital care is clearly equivocal as suggested by the results in the horizon scanning section. This indicates that there is no clear mandate for one model or one group of professionals over the other, at least in terms of the ultimate test, i.e. patient outcome; although it has to be acknowledged that the literature regarding nurses and new practitioners in a pre-hospital emergency care role is very limited. Most research acknowledges that the quality of evidence is still quite poor, with almost no randomised controlled trials being conducted. Few attempts have been made to consider the cost-effectiveness of the varying models. Where these have been attempted the differences are quite stark in terms of the costs associated with medical-delivered systems.

Given the degree of politics involved, a lack of consensus is inevitable due to accepting the position that a certain clinical approach, treatment or destination choice for a patient can happen in different systems, equally effectively, regardless of professional title. Mackenzie et al. (2009), who are leading advocates for doctor provided pre-hospital care, acknowledge this lack of consensus, but draw a different interpretation to other researchers, insisting that a consistent survival advantage has been demonstrated from selected patients in systems where properly targeted specialist pre-hospital care teams (doctors) are used. But is this ‘survival advantage’, if it exists, purely a product of medical training or more a product of an effective

system of suitably trained and deployed clinical staff with the ‘correct’ range of clinical skills?

IX.3/ Specialist Paramedic Practice

There is a slight trend (acknowledged in the Zealand paper) to improved survival for patients at the hyper-acute end of the patient acuity spectrum, which may correlate with the provision of certain skill sets. These patients are small in number, but the provision of pre-hospital care by more experienced clinicians, of whatever tribe, coupled with certain ALS procedures, may be of relevance. Certainly, seniority (or more specifically the lack of it) has been repeatedly cited as a cause of increased mortality in hospitals at night and during weekends when more junior staff are often left to care for seriously ill patients. This is a frequency and criticality debate issue, i.e. the more frequently an individual encounters a seriously ill patient the better they become at delivering care. This is an important point for paramedics and the organisation of pre-hospital emergency ambulance services, which often simply send the nearest, not necessarily the most appropriate unit to attend a given incident.

For this reason, it would seem logical, particularly in relation to patients at the more high-risk end of the injury and illness spectrum, to develop the paramedic workforce along specialist lines, increasing clinical responsibility. This has a number of advantages and is becoming more common particularly in relation to the development of specialist paramedics working with those patients presenting at the other end of the continuum with undifferentiated urgent care presentations. There is

a further advantage in relation to enabling the host organisation, typically the Ambulance Service, to meet the realities of 999 demands (Mason, Pickering, Turner, Bradley and Irving 2009).

A similar approach has been adopted using Critical Care Paramedics (CCPs), specialist paramedics who are specifically designed to address the needs of the sickest patient. Jashapara (2010) has reported on one such scheme and predicted a 2.2–5.4% 'life saving' (improvement in preventable death rate) advantage over basic registration level paramedics and a cost advantage over utilising medical staff of £267,752, (cost per year of life saved equalling £34,059 vs £302.341) as detailed in the Horizon Scanning and Discussions chapters (Chapters VIII and IX). One of the key assumptions underpinning this analysis is that certain competencies can affect patient outcome in certain cases and these tend to cluster around the concepts of effective patient assessment, advance airway skills and cardiovascular management. Nonetheless, Hughes (2011) took offence at the report's finding, stating that the 'conclusions were unsound'. Of course medical staff, principally drawn from the new sub-speciality (with a parent speciality of Emergency Medicine) could fulfil this role if cost was not an option and the number of these doctors is rising, as detected in the Horizon Scanning section. If the costs and benefits of medical staffing are considered more broadly it is worthy of note that recent reports from NHS England and a 'special' Sunday Times (2013) leader article have reported that 4,400 additional lives could be saved if senior medical staff were available to patients in hospital at weekends. Targeting available medical staff to this priority would accomplish more by way of health gain than more speculative employment in the pre-hospital setting.

Cost is not the only issue and there is already a noted crisis in emergency medicine, as reported by Calkin (2012) who suggests that the speciality is proving unattractive to many potential recruits due to shift work and poor work-life balance, factors long noted in ambulance service duties. A recent report by the *Emergency Medicine Taskforce Interim Report*, (2013) paints a grim picture, noting that the Emergency Medicine speciality training places report less than a 50% 'fill-rate'. Diverting medical staff away from hospitals where the evidence base for their value is not in doubt and from medical specialities would seem somewhat counterproductive. Figure 112 makes comparisons between paramedics, CCPs or doctors in pre-hospital care roles indicating that there are financial and potentially experiential advantages in using senior paramedics to carry out these duties.

To some extent these conclusions, in relation to skill levels of paramedics, are extrapolations of some of the more advanced paramedic systems, particularly the Mobile Intensive Care Paramedic (MICA) scheme in Melbourne, Australia, as described by Zalstein et al (2010). Such schemes do have access to sophisticated airway management techniques, including rapid sequence induction and intubation and this, in the hands of MICA paramedics, has been shown to improve patient outcome in a recent randomised controlled trial (Bernard et al. 2010).

This trial, builds on a previous study by Bernard, Smith, Foster, Hogan, and Patrick (2002), which limited use of RSI to only helicopter-based paramedics and other studies that suggested a role for the procedure in a pre-hospital setting (Winchell and Hoyt, 1997; Gausche et al, 2000; Ochs, Davis, Hoyt, Bailey, Marshall and Rosen, 2002). It also preceded another paper on the subject by Dunford, Davis, Ochs,

Doney and Hoyt (2003) which produced less favourable results. The key discriminating difference between the studies was that the Bernard approach was to train only a limited number of closely monitored and supported paramedics to provide RSI and to ensure intensive preparation, whereas Dunford et al. (2003) only provided a very short attenuated level of training for a much wider group of paramedics. An even more recent paper (Kwok, Prekkera, Grabinskyd, Carlboma, and Rea 2013) reports the successful use of RSI by paramedics in the Seattle system, who utilised the technique for critically ill patients who had been resuscitated from cardiac arrest, demonstrating a clear survival benefit. It is also important to note that in systems that 'target' specialist paramedics [such as CCPs/MICAs etc] selecting the most serious cases the increased level of patient exposure appears to be a positive effect on clinical performance (Pepe, Stout, Vincent and Mosesso, 2000).

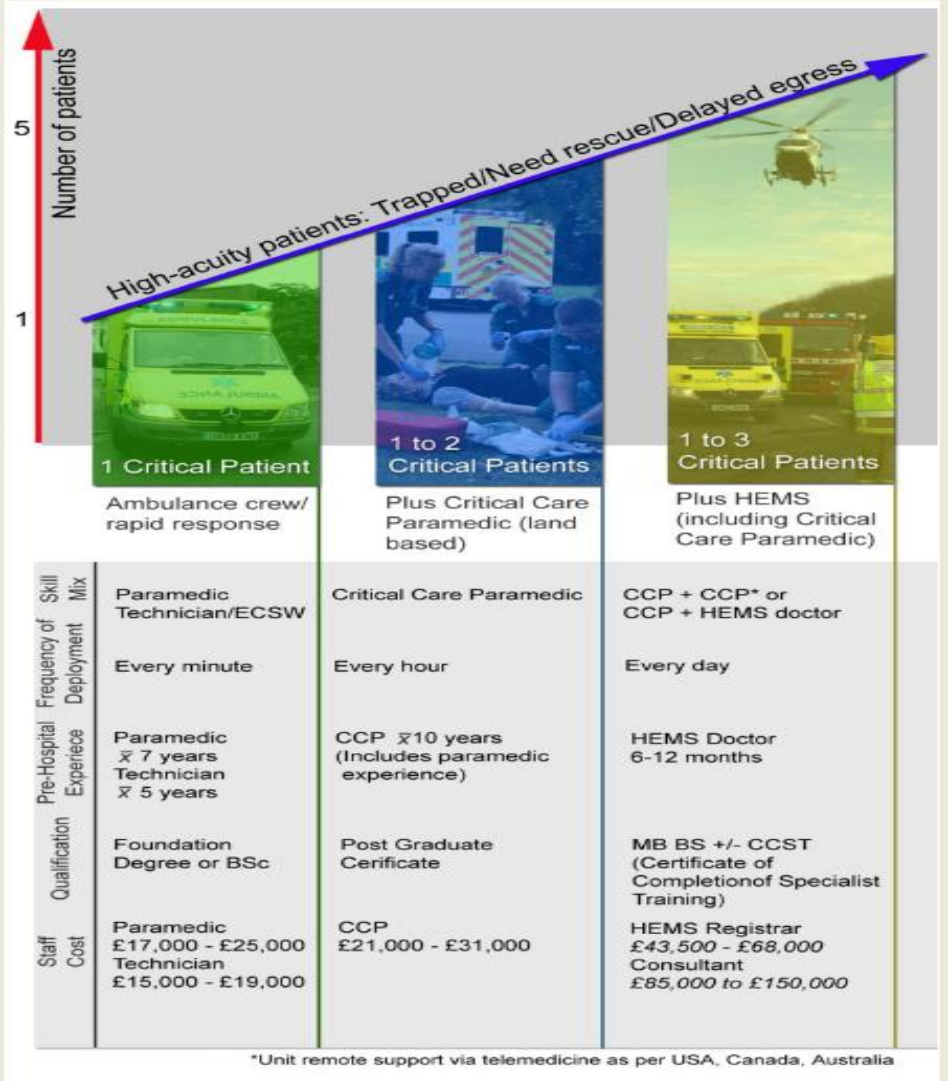

Figure 112: A comparison of Paramedics & Medical Staff by educational level and field experience.

These types of extended paramedic capabilities, advanced patient assessment, whether for undifferentiated urgent care cases or the assessment of the critically ill and injured, when combined with new skill sets such as the ability to provide advanced airway management skills, take the notion of the paramedic as a 'disruptive technology' to a new level. Most disruptions as defined by Christensen (2009) revolve around the concept of a simpler, increasingly effective and cheaper year on year development, illustrated graphically in figure 113. If it is possible to combine this technology with a more effective delivery and business model, an even

greater level of value is created. The key tactic to realise these efficiencies is the adoption of a 'concept of operation' that the 'product' the paramedic can operate within, hence the need to define both the disruptive technology itself and the pattern of delivery. Various models have been described and one, the Front Loaded Service Model (FLSM), is discussed later in this section. Other key ingredients to ensure the continued relevance of the paramedic in order to make certain that the pace of improvement is sustained must, therefore, be the educational and career structure, which represent other elements of the infrastructure necessary for continued 'nourishment' and development.

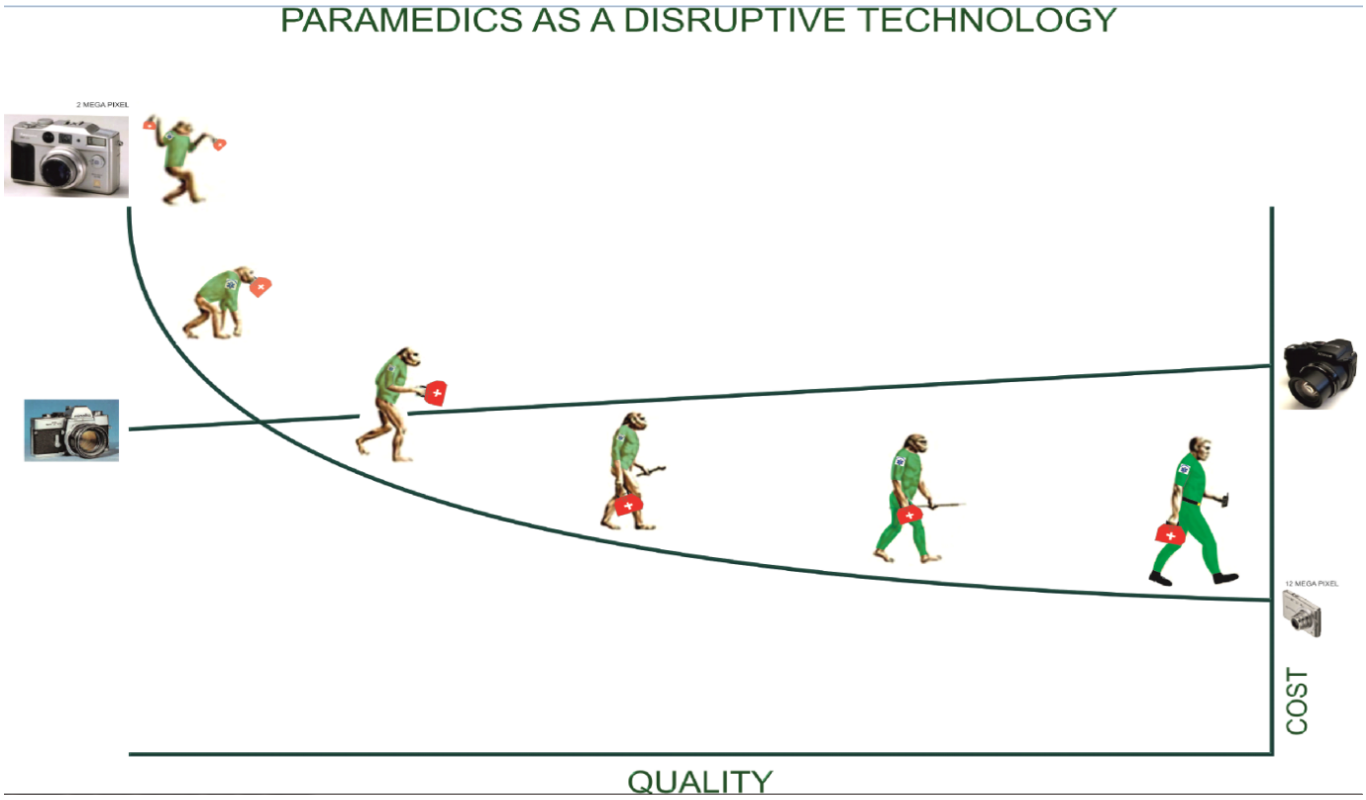

Figure 113: Paramedics as a disruptive technology.

It would seem reasonable to conclude that a combination of experienced, well trained paramedic personnel, working in modern well equipped ambulance services, within a

career structure that allows for personal development and which couples this with an appropriate tasking system to match, would be a more appropriate organisational approach than the more common arrangements. If the availability of clinical networks is added, in the form of trauma, stroke, cardiac and other referral networks, with strong professional support from medical and nursing colleagues, the outcome could reasonably be expected to be good for both patients and paramedics alike. Taking the seriously ill and injured to specialist centres is a feature of many successful systems, as happens in Melbourne and this does confer an important survival benefit and a substantial and welcome financial benefit. This clinical performance can be duplicated by some medically staffed services, but not the financial advantage. Professional title is not, therefore, the overriding or differentiating factor.

Table 24: Summarising positions of key stakeholders

NHS Ambulance Service/Paramedic Clinical Concept of Operations 2030

Summarising positions of key stakeholders considered within the Horizon Scanning section			
	2003/4	**2013**	**Remarks**
Ambulance Staff	Based on responses in this study, staff favoured a move to HEI provision	Responses still appear to be valid. HEI based paramedic programmes are very well supported with strong recruitment across the UK, particularly in England	There has been an increase in the number of paramedic staff and indeed the number of direct entrants joining the Ambulance Service selecting HEI pathways has dramatically increased.

Employers, including Ambulance Chief Executive Group, ACEG (formed in 2008)	No firm view, the AETAG position paper, however, was agreed in principle	Wide variation in ambulance trusts, although a clear trend to embracing HEI based provision is emerging, with the strongest trend in England	Despite a reduction in the number of ambulance trusts, the situation remains somewhat confused, with mixed training and education provision in most trusts. Only two trusts have moved to a 100% undergraduate model for student paramedics. However, there are grounds for cautious optimism with a recent joint approach from the CoP and NHS employers, asking the HCPC to raise the threshold entry level to a Foundation Degree or Diploma in Higher Education
Regulator	SOPs and SETs were developed at 'certificate level'.	Revised SOPs cannot be met with existing IHCD provision, but continue to be accepted to the register, albeit with some course revision in light of the HCPC approval process. No agreement by the HCPC to move to Diploma or BSc level programmes as a minimum requirement	The HCPC reviewed their approvals process, but in the event continued to accept a certificate level arrangement. A consultation regarding post-registration qualification has recently been concluded, with no change to the likely result. A response to the joint proposal to increase threshold entry standards is awaited
DH	No firm policy.	A strengthening commitment to higher education, but funding arrangements lag behind. Policy initiatives in respect of major trauma and major incident response. Increasingly strong support from the AHP branch with less interest from the Urgent Care branch. (Responsibility for paramedics is shared between these sections.)	The 'Taking Health Care to the Patient', (Bradley) report, has firmly set the Dip HE/Foundation Degree, as the base level for paramedic registration. Multi-professional and training budgets being used to support some paramedic programmes in England. Professor Willett's national trauma report, the Major Emergency Incident Response Team (MEIRT) published, and is broadly supportive of more medical involvement

Professional Body	Newly formed, but supported the need for Dip HE or higher award	A growing membership, with growing influence and firm commitment to HEI based provision	The CoP January 2008 Curriculum Framework document sets the DipHE/Foundation Degree, as the base level for registration. Although not fully resolved, there is an acceptance that BSc level programmes are most desirable. The next version of the Curriculum Framework is due in 2013 and will contain a section dealing with specialist practice
Trades Unions	No direct position, but broadly supportive	No direct position, but broadly supportive. However, recent engagement from one major union, Unison.	A heightened awareness and support for the need to strengthen educational provision for paramedics
Medical Profession	Interest from the Faculty of Pre-hospital care to develop a stronger medical presence in the pre-hospital care setting and to do so on a paid basis in preference to earlier voluntary schemes	Proposals to develop a new sub-speciality of pre-hospital care were approved by the GMC and have now resulted in a small number of trainees, in a move that has been aggressively pursued by the Faculty of Pre-hospital Care and the 'Inter-Collegiate Board'	The single most important development in recent years, which has led to unresolved tensions between the paramedical and medical professions. Discussions between the CoP and the Faculty of Pre-Hospital Care continues but, as yet, no agreement regarding how paramedics might access this sub-speciality training or reciprocity issues have been resolved.

Table 24 is designed to be considered with some reference to the many points made in the text in relation to the movement of key stakeholders that have taken place during the last 10 years. It demonstrates that much has changed, but equally acknowledges that staff and the professional body appear most engaged in change, with employers lagging behind. Despite improvements in the capabilities in paramedics, the medical profession has developed a parallel role to that of the paramedic. Other stakeholders have had less influence and this synopsis may be helpful when considering, particularly, table 25 but also with reference to the other tables in this section (pp. 379-384), the various future scenarios.

The UK spends approximately 8% of its GDP on health care, which is close to the EU average of 9%, and is broadly in line with other developed countries; the United States is, however, an outlier, with an annual health spend of 18% of GDP. Many commentators have suggested that the continued upward trend is unsustainable and some, such as Le Fanu (1999), argue that the pace of clinical advance will slow and ease pressure on budgets, but this seems unlikely. Barker (2010) in his analysis, *The Future of Medicine: Avoiding a Medical Meltdown*, offers three alternative strategies for reducing cost; reduced public expectations (considered unlikely), rigorous control of health care costs using a variety of strategies, including cost effectiveness thresholds and efforts to drive down the price of technology and, care delivery (considered potentially feasible). Barker advised caution against developing new medical specialities, which drive up costs. Nevertheless, and even assuming effective cost containment, Barker sees little alternative to a doubling of UK health expenditure to 16% by 2030.

These latter factors have a degree of synergy with the aspirations of allied health professionals and, indeed, the nursing profession, but, as yet, there is no indication that current national policymakers will continue this trend, which was supported by the previous government, particularly in relation to nurses. Leonard (1998) found that this expansion of roles was popular with patients and staff alike and helped the prospect for cost control. Kendall (2001), a former special advisor to a previous Secretary of State for Health and a former Chief Executive of the Ambulance Service Network, part of the NHS Confederation, advances the view in her book (*The Future Patient*) that there may be wider patient benefits to be derived from such professional development in terms of improved patient satisfaction, partly derived from a more

equal professional-patient relationship. To some extent this supposition can be borne out through patient satisfaction surveys, which tend to rate paramedics highly.

The creation of new medical disciplines, such as the proposed medical specialisation of pre-hospital care, adds to cost pressures, whereas conversely, using cheaper, but equally effective personnel such as paramedics, have countervailing and financially virtuous actions. This task shifting from paramedics to doctors, is in marked contrast to the normal direction of travel from doctors to paramedics, allied health professionals, nurses etc. In an article, *Squeezing out the Doctor* (2012), Favaretti writes that there are 27.4 doctors for every 10,000 patients, well ahead of WHO recommendations, but concludes that the demand for health care cannot go on being met by simply training more medical staff as in earlier centuries. In reviewing worldwide trends, he draws the conclusion that many examples existed around the world of non-medical staff undertaking hitherto medical tasks with equally good or better results. One example cited, which extrapolated this trend is the work of Dr Shetty's approach for the delivery of private-for-profit heart surgery in India where 15% of all heart surgery is delivered by non-medically qualified, but medically supervised non-physicians, with excellent results. The combination of paramedics, operating within an effective organisation and clinical delivery model, utilising sophisticated triage process, logistically sound deployment practices and armed with modern technology, could contribute to cost containment goals.

From an organisational delivery perspective, the current model of care in the NHS today is strikingly similar to that which was established at its inception in 1948, a surprising finding given the very dramatic changes in demography, epidemiology,

social norms, medical technology, increased medical specialisation and other factors. There is still a large reliance upon acute hospitals, typically District General Hospitals (DGHs) which, until quite recently, were regarded as capable of dealing with the majority of ill health and injury from catchment populations that do not generally exceed 250,000 people. In reality, hospitals provide only 10% of the health care for their communities, with the other 90% provided by the primary care services, but the dependency of patients who are admitted to hospitals is increasing.

The current reorganisation of the NHS is gradually resulting in the stratifying of hospitals and by 2030 it is possible that all hospitals will be graded into one of a small number of gradations. These may include Critical Care Hospitals (CCHs), of which there will be relatively few. It is likely that most of these units will be teaching hospitals with extensive research commitments and offering major trauma, cardiac, stroke, vascular, paediatric and other capabilities. Major General Hospitals (MGHs), effectively larger DGHs, and more numerous than CCHs are likely to be located in those urban centres without CCHs serving a larger population base of between 450,000 and 500,000. The more numerous Community Hospitals (CHs) or similar nomenclature will be much more limited in their capabilities. Examples of this approach have appeared in regional Strategic Health Authority (SHA) documents, such as the South East Regions, Fit for the Future consultations. Organisationally, some of these may be paired with MGHs and the prototype for such arrangements can already be seen in some NHS organisations that operate a ‘hot’ (main hospital with 24 hour surgical and other services) and ‘cold’ (subsidiary hospital, which has lower tier medical service) over two sites, but with the same Trust. There will be a continuing emphasis upon services provided in the community, with a concomitant

need for higher levels of inter-service integration than has been achieved before. Such arrangements, particularly in terms of the role of grading hospitals, although less so in the provision of supporting community services, have been common in North America, while many European and other industrialised countries achieved both changes in hospital roles and more reliance upon community services decades ago. In the UK, some concerns over increased travel time have been raised and considered by Nicol, West, Goodacre, and Turner (2007).

In particular, the CCHs are expected to provide more sophisticated services for those patients requiring cardiology, neurological care, major vascular surgery, complex trauma care and intensive therapy services. There will be many occasions when it will be in the direct interest of patients to be directly transported to such facilities, especially so when one considers the acutely time dependent nature of many medical and surgical emergencies such as heart attack, stroke and major haemorrhage. This approach is increasingly enshrined in national policy guidance (*Mending Hearts and Brains*, 2010, *National Guidance for the establishment of Regional Networks for Major Trauma*, 2010, and *Commissioning Guidance*, 2009).

Table 25: Based on the SECAmb SHA *Fit for the Future* Acute Medicine Sub-Group Report (2007) but now increasingly nationally applicable

Critical Care Hospital (probably existing teaching hospitals)	Major General Hospital (probably a proportion of the larger current DGH units)	Community Based Hospital 'Polyclinic' (a designation used by the former government) A proportion of the smaller DGH units are likely to take on this form
• 24/7 consultant led services, including Emergency Medicine	• 24/7 consultant led services, including Emergency Medicine	• Urgent Care Centre/Walk in Centre, nurse led, (in some cases an 'Emergency Care Centre', acute physician led

• Level 3 ITU	• Level 3 ITU	• Enhanced Community Hospital Services
• Major Trauma	• Outreach services, such as vascular surgery	• Primary Care
• Paediatric & Neonatal Services	• Some trauma cases	• Community Care
• Complex interventional Cardiology [pPCI] 'heart attack centre'	• Obstetrics	• Social Care
• Neurosurgery, 'stroke centre'	• Cardiology (possibly interventional in some cases)	• Some diagnostics
• Obstetrics	• 'hot' 27/7surgery for most acute surgical conditions	• Routine, 'cold' surgery, with an emphasis on day cases
• All MGH services	• Acute medicine	• Possibly midwife led delivery unit, for low risk births
• Advanced Diagnostics	• Rehabilitation services	• Rehabilitation services
• Rehabilitation services		

a) In addition to the changes in the arrangements for the delivery of acute care, there will also be continued changes to Primary Care, particularly out-of-hours care, which, in common with the acute sector, may receive more attention from the commercial sector. This is projected to lead to major hospital reconfiguration as discussed in the Institute for Public Policy Research briefing document, which regard such developments as increasingly likely to be implemented on a wider scale, despite not yet being a fully proven concept. From the patient perspective and, indeed, that of the Ambulance Service, the experience of commercial services has not been of a universally high standard. CQC accreditation is likely

to have a positive impact in this area. Definitional clarity is an important factor here and the DH offers the following descriptions to avoid confusion:

b) Emergency Care = immediate response to time-critical health care need. This area represents the primary raisons d'etre of paramedics, who are widely available to respond to health needs;

c) Unscheduled care = services that are available for the public to access without prior arrangement when there is an urgent actual or perceived need for intervention by a health or social care professional. This area of practice is increasingly well serviced by paramedics and particularly by those with specialist training in primary care;

d) Urgent care = a response before the next in-hours or routine (primary care) service is available.

From the Ambulance Service's perspective and in this example, the interests of patients, paramedics and the Ambulance Service are closely aligned; it is essential to ensure that clinically serious cases receive the highest level of attention, with services designed around clinical need. Patients and service users may hold different perceptions and views regarding individual priorities and there will be many cases where telephone consultations, reassurance and support will need to be supplemented with a face-to-face assessment. These assessments will need to be undertaken by staff who are adequately trained and supervised – potentially paramedics or nurses, working within their competency envelope and with access to medical advice to resolve the inevitable ambiguities that accompany many patient

encounters. A cornerstone of developing strategy should be to link paramedic practitioner staff closely with selected general practitioners in order to draw on the expertise, help and advice of family doctors who are particularly well versed in handling uncertainty.

The clinical Concept of Operations (CONOPS) of the Ambulance Service is changing perhaps more radically and at a faster rate than the wider NHS, with greater emphasis upon clinical rather than the historical transport function. This trend is illustrated using the following diagrammatic representation in figure 114. However, this is not driven by any national policy or doctrinal clarity. Indeed, the level of variation between individual ambulance trusts is significant and this variation, to some degree, extends to areas where variation is less desirable and possibly incompatible with good practice, specifically in the area of major incident preparation and planning. This was noted in the Royal United Services Institute paper (2011) which examined the lessons to be learnt from the 7/7 tragedy, *Anatomy of a Terrorist Attack*. This document considered the situation in relation to the three emergency services, but a lack of strategic and policy co-ordination can also be specifically discerned within the Ambulance Service.

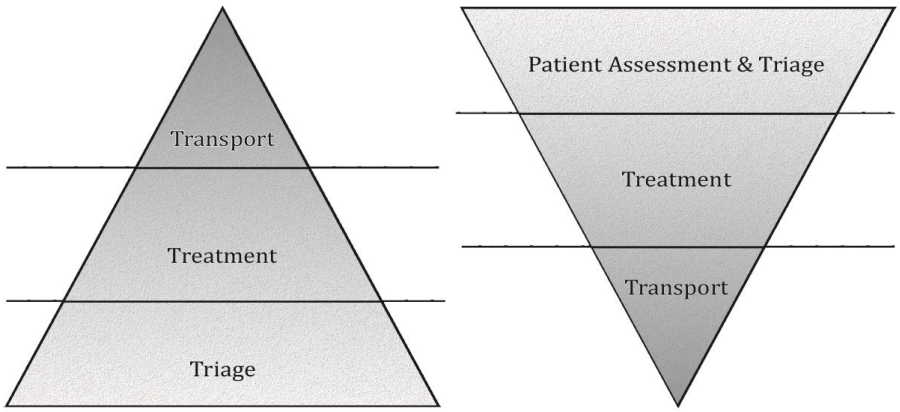

Figure 114: The Developing Operational Model of Ambulance Service Delivery.

A similar document has recently been published in the United States titled, Consolidated Federal Leadership for Emergency Medical Services: *An Essential Step to Improve National Preparedness: A perspective from EMS on the front line*, (International Association of Emergency Medical Service Chiefs, 2011). There appears to be a lack of coherence between the primary influencing bodies, processes and structures. Some protagonists go as far as suggesting that fire and ambulance services should, indeed, be merged. (All Party Parliamentary Group on Homeland Security. (2013). *Improving Efficiency, Interoperability and Resilience of our Blue Light Services*). Or, at least be encouraged to demonstrate much higher levels of collaboration and integration (Knight, 2013, *Facing the Future: Findings from the review of efficiencies and operations in fire and rescue authorities in England*).

The clinical ramifications of the change in emphasis (depicted in Fig 114) are substantial, both operationally and in regard to professional issues for paramedics, upon whom the preponderance of the new responsibilities fall. In reality, this

evolution in role has been led by patient demand and reconfiguration within the wider NHS, particularly those that have affected general practice, including the amendments in the contractual obligations of GPs. 999 call volumes increased from approximately one million in 1966 to nearly six million today, with a massive increase in the order of 100% occurring between 1996 (3.2 million) and 2006. Essentially, the Bradley Report (DH, 2005: *Taking Health Care to the Patient)* has made a virtue out of necessity and recommended that the Ambulance Service take on the responsibilities of a mobile health care provider. This encompasses the broad objective of reducing the number of patient transports to hospital by approximately 25%, or roughly 1.5 million journeys per annum.

Ambulance system design has been noted to play a pivotal role in patient outcome and is as much a factor in producing quality patient outcome as other more obvious aspects, such as clinical patient care (Stout, 1986). Therefore, the operational model for delivering ambulance services will need to be radically revised and will need to be accomplished at the same time as incorporating the many professional and educational changes necessary to accompany the process. The model will have many differences to the transport-based operations provided today. It will be 'front-loaded', in the sense that the ambulance clinicians attending patients will increasingly be paramedics with further skills in patient assessment and referral. For these staff to be effective, it will be important to have a range of referral opportunities, therapies, good communications and procedures with the local health economy, as well as good relations, particularly with GPs, some of whom will be responsible for much of the clinical training and support of our staff.

This modernisation effort is far reaching and involves a large number of stakeholders. It will need to complete the efficiency recommendations promulgated in the Audit Commission's *Life in the Fast Lane* published in 1998, the ASA Strategic Review of Ambulance Services and the DH's report *Transforming Emergency Care* (2004) and the previous *Reforming Emergency Care* initiatives. For true high performance objectives to be achieved, it will also need to assimilate the lessons from *A Guide to Effective [Ambulance Service] System Design*, authored by Jack Stout in 1986 and currently, unsurpassed. This model of service delivery promotes the Anglo-American concept of emergency care (in contrast to the alternate Franco-German model) and places it within a clear business and quality performance framework.

One key comparison with more traditional concepts of operation relates to the necessary move from effectively what has been a single tier of operation, principally ambulances crewed by ambulance technicians, to one where many paramedics undertake specialised training and education to enable them to manage patients with primary and critical life-threatening conditions more effectively. This clinical concept of operation will also dictate a tiered approach to service provision, with a move away from an all ALS service to one with Basic Life Support (BLS) and a range of other capabilities. Such arrangements appear to be more effective in delivering superior patient outcomes and there is evidence within the literature to support this contention, such as Pepe et al's work (2000), *Tiered-Response Ambulance Services*. It is also a change, which, while rarely fully implemented within UK ambulance services, was identified as desirable in a Delphi consensus-building exercise of senior Ambulance Service managers conducted by Hassan and Barnett (2002).

AMPDS and NHSP codes are only broad descriptions of the clinical acuity of an incident, but they give a useful indication as to the status of an individual incident. The number and percentage of ‘A’, (with an 8 minute target of 75%) and a 19 minute category ‘A’ target of 19 minutes reported by individual ambulance services does show some variation. These overall targets are nationally determined and have recently been revised further, driving category ‘A’ into Red 1, essentially cardiac arrest patients, and Red 2 calls, which are considered serious medical emergencies but below the threshold of a cardiac arrest. At the local level, commissioners can decide what response time horizon they require for the ’C’ cases. Dispatch codes are allocated between these categories, with approximately 30% being designated ‘A’, or immediately life-threatening.

By arranging the codes in this fashion, it is possible to attach the skill level of the allocated resources as well as the type of resource. In the interpretation of such work it is clear that many of the cases that currently receive an ambulance response could alternatively be handled by either a paramedic operating in a control centre, using triage software, such as NHSP or through initiating ‘solo’ – a single paramedic responder, ideally one who has specialised training in assessment, treatment and referral.

IX.4/ The Relationship Between the Operational Model, Workforce Development and the Delivery of Cost Effective Health Care

There is a close, indeed implicit, link between the modernisation of the Ambulance Service's Operational Model and the development of the workforce; it is these two variables that will need to be carefully developed in tandem to produce the desired result. Success can be identified across three broad domains, i.e. patients, the workforce and the wider health economy. The following areas are considered to be of importance and are summarised as follows:

For patients:

a) Enhanced triage and treatment options using both telephone and face-to-face assessment at low cost, in comparison to alternative models

b) More appropriate, high quality care provided as closely to home as possible

c) Fewer episodes of transport to hospital

d) Where transport to hospital is necessary, patients will be conveyed to the most appropriate hospital where feasible

e) Access to ‘pathways’ of care that have been agreed between ambulance services and the wider NHS, so that from the patient’s perspective the transfer between agencies appears fully integrated and seamless

f) Patient safety

g) To a lesser extent, choice (of hospital destination in some limited cases) but more about the choices that can be exercised if taken to the correct facility for patient need.

For the workforce:

a) A fully developed clinical career structure similar to any other AHP

b) Training and education that accurately reflects the tasks and patient encounters in practice

c) Professionally accredited training and education that enables professional qualifications to be acquired from the Higher Education sector

d) Access to higher pay bands

e) A career that provides clinical challenges of a progressively more complex nature, a wider scope of practice

f) Clinical supervision and clinical leadership from both peer and senior clinical staff

g) A wider range of treatment options and patient referral pathways to reduce unnecessary transportations

h) Greater opportunities and higher job satisfaction.

For the wider health economy:

a) Delivery of higher quality services for patients by the Ambulance Service

b) More effective use of NHS resources, culminating in reduced health system costs

c) A reduced conveyance rate to A&E Centres

d) The prospect of reduced admission rates

e) More effective use of community services through improved co-ordination and better integration

f) Maintenance and enhancement of the Ambulance Service's traditional emergency service function.

Once 999 demand (incorporating 'urgent' cases, i.e. those generated by general practitioners and possibly later 'out-of-hours' cases) have been categorised utilising AMPDS or NHSP and the response options mapped, it will become possible to attach the most appropriate resource to the most suitable call. To some extent, this is already being attempted but there is much variation in practice. Whilst educational programmes are developed, there will be a continuing need for a phased approach to implementation, resulting in an appropriate number of suitable resources, i.e. Paramedic Practitioners or using the NHS career framework (Appendix VIII) language 'specialist paramedics' who would work in the solo clinician role triaging, treating and referring patients as required within their expanded scope of practice.

It should also be possible to vary the level of ambulance crew staffing, using ECSWs either crewed with an ambulance technician, paramedic or other ECSWs. In the

latter, crew configuration tasking should be restricted to either pre-screened cases of lower acuity or where paramedic backup can be provided quickly. The ambulance technician band is currently not explicitly recognised in the NHS Career Framework model and the role and skills of this group of clinicians will change. While not directly comparable, there are some broad similarities to the historical changes that occurred in nursing some years ago with the changing role of enrolled nurses and their gradual replacement with health care assistants. Even today, enrolled nurses work within Acute, Community and Primary Care Trusts to the level of their competency although none have been trained as enrolled nurses for many years.

Such a development could lead to a situation where the new operational model is populated by a higher proportion of staff with a lower skill base, but the majority of emergency patients are seen and assessed by the most skilled and experienced staff as a first response (i.e. Paramedic Practitioner or paramedic). This is the FLSM and should not cause a major problem when the model is fully evolved with effective triage and dispatch in place. For this reason, it may be worth considering replacing the ambulance technician with a range of ‘associate’ or ‘assistant’ practitioners, as has been achieved with physiotherapy, radiography and other AHPs. This would enable the full range of NHS Ambulance Career Framework bandings to be utilised.

Skills would be acquired in the following order – basic ambulance-based competencies or ECSWs who would have a first responder role and a transport focus. There would be more advanced ambulance aid skills at the intermediate life support level for associate practitioners, linked to a broader training. The ALS for paramedics will combine the full range of competencies in the CoP curriculum

framework (Appendix VIII). Primary care assessment, treatment and referral will be for Paramedic Practitioners/senior paramedics. Senior paramedics would also have a role in providing clinical leadership and supervision. Beyond this level would be more advanced practitioners, specialising in primary, critical or special care areas and at the more advanced level there would be consultant paramedics and paramedic directors.

Table 26 illustrates how ambulance staff operating at different clinical levels could serve different patient groups, demonstrating how a service can be delivered in a clinically appropriate (with the right skills level) as well as economic fashion. It is proposed that for patient safety, the minimum crew composition would be at levels of 4+3. However, a 3+3 might be reasonable to undertake intermediate tier-type duties e.g. conveyance of a patient who has received an initial assessment from a registered health care professional.

Table 26: Ambulance staff operating at different clinical levels can serve different Patient Groups more effectively.

Patient Groups	Telephone Response	Initial 'Solo' response	Ambulance Response with crew level [NHS career framework levels]
A – Cardiac Arrest	Telephone CPR	Level 5 or 6	Nearest response, supported by level 6 CCPs or level 5 paramedics
A – Cardiac Problems	Telephone pre-arrival instructions, PAI & post dispatch instructions, PDIs	Level 5 or 6	A/A
C - Minor Illness	Post dispatch instructions [probable NHSP]. Telephone resolution more likely	Level 6	Paramedic Practitioner or paramedic, with needs led transportation
C - Minor Injury	PAIs and PDIs, [probable NHSP]. Telephone resolution more likely	Level 6	A/A, but transport requirement less likely

It is clear that the pace of change will be a critical success factor in operationalising a future successful model and that the transition will be relatively complex involving both organisational and workforce changes. This fact can be demonstrated by plotting the workforce profile using a Christmas Tree graph (Figures 115 and 116), which uses the levels of the NHS/CoP career framework (Appendix VIII) to help illustrate how the changes might evolve. An indicative model using an example drawn from SECAmb demonstrates that there is a preponderance of band 4 and 5 personnel, using actual data from a Trust establishment. This is broadly representative of UK ambulance services. If the preposition that a more highly skilled, in this case paramedic, workforce is required on the basis that staff at level 3 (typically ECSW) and level 4 (typically ambulance technician) do not possess the range of skills required to enact a more triage, treatment and referral-based clinical concept of operation, then the ratio of staff at each level will need to change. Equally, paramedics at level 5 of the career framework will be insufficiently trained and educated to carry out all the duties that modernised ambulance services would need to deploy. This would, therefore, suggest that the numbers of staff within the specialist paramedics and advanced paramedics in these tiers of the framework need to increase, at the expense of other levels. This is one example of how the workforce may evolve with reference to career framework and by implication clinical capabilities may change in the future.

Figure 115: Christmas Tree Graph 1 - The Current Workforce.

Figure 115 was derived from SECAmb workforce data, showing Accident & Emergency staff by their position within the NHS career framework. For reference, paramedics are shown at levels 5 and 6, with technicians at levels 4 and ECSWs at 3 respectively.

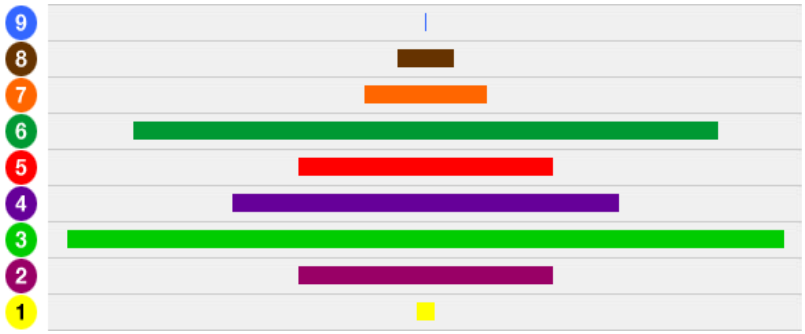

Figure 116: Christmas Tree Graph 2 - The Future Workforce.

Figure 116 is an example projected forward in time to demonstrate the expected changes in the workforce structure. A large proportion of paramedics have migrated into specialist practice at level 6, with others moving up to levels 7 and 8, 'advanced paramedic' and 'consultant paramedic'. Technicians have reduced, while ECSW numbers have increased.

IX.5/ A Possible, Probable or Preferable Future 2030: can a Preferable Future be made more likely?

The three following sections seek to provide a distillation of the information presented in all previous chapters. It represents the output in terms of three summary tables, which in line with the 'future studies' approach presents a 'possible', a 'probable' and a 'preferable' future. The preferable future is gauged from the paramedic perspective, but these conclusions are based on an argument, which considers the needs of others, particularly, patients and taxpayers. The contention is that the case for a preferable future is based on logical conclusions derived from the evidence base as it stands today in late 2013.

To some degree, two of the scenarios represent polar opposites, but neither are beyond the bounds of reason and a third is described colloquially as a 'grin and bear' it outcome. Arguably, this is the most likely 2030 situation, representing something of a compromise or 'muddling through' approach, largely arrived at by stumbling towards 2030 in the absence of clear national policies, and a failure to appraise the available evidence. This is a result of professional power filling this vacuum and gradually imposing a model, which some might see as axiomatically correct.

The tables also summarise the position of some of the key variables examined previously, for example, the other workforce options, and touch on the relationship

between what may or may not emerge from research. It is not difficult to see that the fortunes of paramedics are also inexorably bound to the future of the organisations for whom they work, most notably the NHS Ambulance Service, which remains by far the largest employer. Other career opportunities outside this public service are increasing, but it is unlikely that these could flourish if the prime employer was degraded through privatisation, or the replacement of paramedics in at least their 'hyper-acute' patient care role by other health care professionals, particularly medical staff.

To a limited extent, paramedics hold their future in their own hands. Factors that would militate in making a preferable future more likely would include not just a developing and more capable NHS Ambulance Service, with a leadership that recognised the symbiotic relationship with the paramedic profession, but also other factors. These include a growing professional identity and consciousness, with a commitment to supporting the objectives of the professional body, the evidence base and perhaps most of all, a firm allegiance with the Higher Education sector. This latter variable would involve a migration to more demanding programmes of preparation certainly at a minimum BSc level, in order to graduate paramedics with the capabilities to meet what is an increasingly demanding job. Without this, the role is likely to be pegged at a lower level, with the risk of the job becoming ever less demanding. Therefore, these are the key variables that must be leveraged if a preferable future is to become more likely.

Table 27: 2030. A Possible Future – The Nuclear Option

2030. A Possible Future – The 'nuclear option.'			
Serial	**Issue**	**Doctors from Medical Sub Speciality of 'Pre-Hospital Care'**	**Paramedics**
1	Numbers	1000 Consultant level posts, with supporting more junior medical staff	Reducing numbers from a 12,000 base number in 2013
2	Scope of practice	Full scope of practice	Reducing scope of practice
3	Career prospects	Strong, including senior positions within the Ambulance Service in managerial as well as clinical disciplines	Greatly reduced, few opportunities beyond entry level 5 within the career framework. Reduced promotional prospects, higher staff turnover, with many leaving the role
4	Professional position	High status highly paid. Strong professional body. Desire to act as the Professional Body for Paramedics may be realised	Weak in relation to other AHPs, possible fragmentation of professional body, which might be operated by the FPHC or be operated along devolved lines
5	New practitioners	New practitioners, such as PAs and possibly a re-emerging form of 'ECP' operating under stricter medical control	Fragmentation of the paramedic workforce as 'new practitioners' 'diversify' Ambulance Service Workforce and other areas of 'paramedic practice'
6	Nurses	'Ambulance nurses' become more commonplace, with close relationship to medical establishment	Fragmentation of the paramedic workforce as 'ambulance nurses' 'diversify' Ambulance Service Workforce and other areas of 'paramedic practice.' Statutory board level position on ambulance trust boards
7	Patient outcomes and research	Research shows the superiority of medically provided pre-hospital services over 'dumbed down' paramedic workforce with reduced skills.	Paramedics relegated to support role status, with reduced autonomy, with little access to advancement. Research confirms paramedic role as primarily limited to managing minor cases with strong medical oversight
8	Education	Full range of educational opportunities largely funded	Foundation degree provides the mainstay of paramedic

			preparation and the majority of registrants do not proceed beyond this level. Extensive use of on-line and part-time programme. Remaining BSc programmes find it difficult to recruit as paramedic role becomes marginalised
9	Role of Ambulance Service	Ambulance Service becomes divided between a transportation tier staffed by ambulance personnel and support workers or higher grade and Emergency Medical Service on the pattern of the FGM, largely medically staffed.	Transport tier privatised, numbers of paramedics fall, as support workers increasingly replace paramedics. Low status, poor public perception of 'paramedic' partly due to mis-identification of who is providing services
10	Cost	High cost of service, hidden in wider NHS budget	Costs offset to some extent by reductions in paramedic numbers, privatisation of the Ambulance Service. Progressive casualisation of workforce. However, the major issue is the opportunity costs of failing to turn the Ambulance Service into a mobile health-care provider and the continued transportation of patients, often unnecessarily to hospitals, thereby imposing significant dis-benefits, both financial and quality on the wider NHS

Table 28: 2030. A Preferable Future – A Land of Milk and Honey

2030. A Preferable Future – A land of Milk and Honey?			
Serial	**Issue**	**Doctors from Medical Sub Speciality of 'Pre-Hospital Care.'**	**Paramedics**
1	Numbers	Approximately one consultant in pre-hospital care per English health region, with similar number in proportion in the devolved countries. Approximately 25 UK-wide	Increasing numbers of paramedics in the range of 30,000
2	Scope of practice	Full scope of practice, but more	Scope of practice comparable to

		work focused upon research, teaching, audit and other primarily non-direct patient care functions	leading international paramedic systems, broadly similar to medical sub-speciality scope. Technology provides new opportunities, such as artificial blood and other innovations
3	Career prospects	Limited numbers of consultant position equals limited numbers of opportunities. Appointments as ambulance medical directors are rare, as these directors are drawn from Public Health, who have a broader 'system knowledge' and complement other Ambulance executive skills, with their 'population planning' expertise	A popular career choice with strong recruitment and good prospects of advancement for well-motivated and energetic paramedics. The proportion of paramedics and support workers moves in favour of paramedics. The number of specialist roles and career branches increases. Paramedics fully attuned to their AHP status playing a full and well co-ordinated role with other leading AHP groups
4	Professional position	Relatively low status with medical establishment. More value realised from public health and other areas of medicine that support improvements in pre-hospital care through clinical and policy developments	Equality with other AHP groups, with strong collegiate approach with other professional bodies. High membership, with strong professional identity. Well recognised for contribution across health-care sector and commitment to improving patient care and paramedic professionalism. Paramedics well recognised for the role played in society with strong approval rating from public
5	New practitioners	No 'new practitioners' as the requirement fully met by paramedics. However, a 'fast-track' scheme available for health care and other graduates who wish to attain paramedic status	Strong capable paramedic workforce meeting patient needs across the pre-and 'out of hospital' patient care spectrum. Active recruitment from other motivated professional groups, via fast track process
6	Nurses	No 'ambulance nurses.' However, a 'fast-track' conversion programme available for those nurses who wish to achieve paramedic status	Active recruitment from other motivated professional groups including nursing, via fast track process

7	Patient outcomes & research	Research confirms that professional title is not the defining variable in patient outcomes. These are determined to be more strongly correlated with 'scope of practice', 'system design', 'human-factors' and relevant preparation for care providers	Strong research and self-challenging culture developed within the paramedic profession. Contribution to the evidence base from paramedics increases reaching level studies comparable to other leading AHP groups. International Random Control (RCT) and other research clarifies the relevance and value of paramedics with appropriate knowledge, attitudes, skills and systems
8	Education	Limited number of places for sub-speciality, little interest from well qualified candidates	BSc well established as entry level. Some post-graduate direct entry programmes available, recruiting suitable candidates with a diversity of degree level education. Specialist practice offered at MSc level, with most paramedics in these roles continuing their education to doctoral level
9	Role of Ambulance Service	Ambulance Service becomes ever more integrated with the wider NHS, morphing into a provider of a range of out-of-hospital care. Fully responsible for co-ordination of health telecommunications, triage and home health monitoring	Modern 'Ambulance Service,' now with a much broader health remit, paramedically led. Recognised as a world-class 'British' institution, relevant to the lives of all in the community. High reputation and degree of prestige.
10	Cost	Cost understood in relation to contribution. Overall these are relatively small, but regularly reviewed for relevance, particularly to the contribution of other medical specialists	Modern Ambulance Service remains responsible for approximately 2%-2.5% [with addition of 111 and other co-ordinating functions] of NHS budget, but with the recognition that, if effectively delivered, it can help manage up to 15-20% of costs within a given geographic area, due to decisions made in the field, conveyance/non-conveyance etc

Table 29: 2030. A Probable Future – The 'Grin and Bear it' Option.

2030. A Probable Future – the 'grin and bear it' option.			
Serial	**Issue**	**Doctors from Medical Sub Speciality of 'Pre-Hospital Care'**	**Paramedics**
1	Numbers	Over 100 consultant level posts, with supporting more junior medical staff	Stable numbers of paramedics, slightly increasing from a 12,000 [NHS] base number in 2012 to 15,000 in 2030
2	Scope of practice	Full scope of practice	Modified scope of practice. Example, intubation removed for most staff, but more staff trained in primary care assessment, minor illness and injury treatment. Some CCPs operate as part of medically led HEMS and MIERT teams
3	Career prospects	Strong, including senior positions within the Ambulance Service in managerial as well as clinical disciplines	Weakened, with limited opportunities beyond entry level 5 within the career framework. Some promotion prospects, similar level of turnover
4	Professional position	High status highly paid. Strong professional body. Desire to act as the Professional Body for paramedics may be realised.	Weaker than most other AHP groups some fragmentation of professional body, which might be operated by the FHPC, possibly limited to Scotland. Public confusion of role and status of paramedics.

Table 30: 2030. Wild Card.

2030. Wild Card			
Serial	**Issue**	**Doctors from Medical Sub Speciality of 'Pre-Hospital Care'**	**Paramedics**
1	Political interest in amalgamating Fire and Ambulance Service intensifies, leading to the formation of a new organisation as outlined in the Improving Efficiency Interoperability and Resilience of our Blue Light Services Report (2013)	It is difficult to determine how the role of the new sub-speciality would relate to a national 'Fire and Paramedic Service', however, a single service with a strong emergency care focussed paramedic identity might help to counter-balance the wide spread development of medical staff operating in the pre-hospital role.	Such an option would emphasise the more traditional emergency oriented focus of paramedics and would also risk changing the relationship between the NHS and Paramedics themselves. The emerging role in supplying urgent care needs might pass to other agencies, thereby creating a smaller cadre of paramedics but one with a clear identity and role.

The Horizon Scanning process frequently introduces a 'wild card' option (such as the one in Table 30) an unlikely and even remote but not impossible one that, if introduced would represent a 'game changing' event. A potentially and financially driven merger of Fire and Ambulance services represents such a scenario.

IX.6/ Summary

The chapter brings the various themes and issues together in an integrated way, while also seeking to synthesise answers to the many questions raised during the research study's gestation. In respect of gauging the opinions of ambulance technicians and paramedics regarding their preparation for their roles, two points are of particular

importance, but firstly it must be acknowledged that events moved much more rapidly than could have been imagined and in effect the ambulance technician grade has been virtually swept away. Nevertheless, both grades of staff concluded, by a clear majority view that there were deficiencies in their preparation. Most importantly both groups, again by a sizable majority were clear that moving from a training based model of preparation to one that is more educationally sound was the correct strategy for the future. If this is representative of the workforce generally, then this appears to be a reasonable conclusion. It must be concluded that the thinking of staff was and probably in some ways remains ahead of many within the senior management of the Ambulance Service and ahead of national policy, although the gap between these opinions is narrowing. It is now inevitable that an educational route ultimately at BSc level, will become the norm for all those entering paramedic programmes in the next few years.

In respect of the second question that sought to evaluate competing professional alternatives to paramedics the picture is more complex and consequently less clear. Nevertheless, the interest and in some cases experimentation using nursing staff as ambulance crews has not continued, and this model of ambulance staffing, which is seen in for example Sweden and Holland, is therefore very unlikely to feature in the future, although the use of nursing staff to deal with some cases, as determined by triage systems within ambulance services is more likely. At the commencement of this study, the notion of ‘new practitioners’ loomed large, the development of these roles was strongly supported by the previous government, but interest has now dwindled. The idea has not died completely, but with the strengthening of position and indeed doubling in

size of the number of registered paramedics and the gradual implementation of a national career framework for allied health professionals, [from which paramedics were previously excluded], the situation has now changed in favour of paramedics. What has not changed is the power and influence of the medical profession, elements of which continue to advocate for a Franco-German model with medical staff undertaking the role of paramedics. The evidence base for the superiority of the value of doctors or paramedics in the pre-hospital role remains incomplete and no national policy exists to guide commissioners. Financial pressures may play a role, but medical interest is likely to continue.

One aspect that complicates any final resolution as to which group of staff will carry forward pre-hospital care in the future is the increasing instability within the NHS. The Health and Social Care Act (2012) has guaranteed a more plural market and an ever-increasing range of provider organisation, from outside the NHS, both private and third sector. Financial uncertainty continues to drive service reconfiguration and despite a degree of relative protection in terms of budgets, it is likely that much change will continue to be reactive, rather than planned. For the ambulance service and paramedics to make the most of these opportunities a clear doctrine will be necessary, one that embraces the fact that demand for emergency services has changed, requiring the ambulance service and paramedics to change with it in order to remain relevant and effective in meeting tomorrow's challenges.

Chapter X

Conclusion

While a few cynics remain it is increasingly clear that paramedics and ambulance services can either be configured to provide clinically effective services for patients or not as the case may be. Fundamentally, there are essentially two models from which to choose internationally, the FGM and the AAM. Individual systems employ a multiplicity of variables in a variety of combinations making comparisons less than straightforward. There are also important considerations such as the wide diversity of settings in which ambulance services generally, and paramedic care specifically, are delivered.

These include, urban, rural, ‘hazardous environments’ and many other circumstances, which influence the extent to which services contribute to patient care and outcome. Other important matters include the type of health and emergency service design, scope of practice, cultural factors, levels of authorised independent action, professional status and educational preparation. It is this last factor, educational preparedness that, for paramedics in particular, appears to be a most important concern, one that in the context of the UK has become a critical factor in how the emerging paramedic profession will evolve in the next few years.

One of the main contentions in this study is that it is very likely that there is a strong synergistic relationship between service design arrangements; the preparation of paramedics themselves and ultimately the ability to deliver successful, cost effective care using paramedics and primary care providers. Education is, therefore, considered to be the key facilitative agent, which unlocks the potential of paramedics and their contribution to patient care, both in the context of ambulance or emergency medical services and also within a wider health care system. This is recognised by many paramedics themselves, as they assume greater responsibilities for initially managing larger volumes of patients and also because there is a concomitant increase in the spectrum of clinical need and complexity being encountered on a daily basis in the UK and in many other countries.

This places a premium upon the ability of paramedics to be able to competently and safely assess, treat, sometimes discharge and often refer patients to a range of local community services thereby meeting the needs of patients with less critical conditions more effectively, more conveniently and doing so in a cost sensitive manner. For patients with truly life-threatening emergency presentations, including major injury, stoke and ‘heart attacks,’ definitive treatment centres are now often located many miles from where an emergency takes place and can therefore involve long transfer times. In order to meet the needs of these patients, paramedics will need to be able to employ advanced patient assessment and resuscitation skills to ensure that no avoidable deterioration takes place before the patient reaches the appropriate specialist centre.

Once a critical mass of suitably educated and experienced paramedics exists, operating within a fully developed career structure and deployed in line with the FLSM, the effect could be an improvement in patient care together with a transformative effect on parts of the health care system. In consequence, the Ambulance Service and the paramedic profession, becomes more relevant to the needs of patients as well as being more flexible and in consequence can help play a greater part in creating a more affordable future for the NHS.

Examples of paramedic services progressively evolving to meet a wider range of patient need are available in many countries, but not yet universally, around the world. Any measures of success must consider the humanitarian context including such imperatives as the relief of physical distress, such as the management of pain, more effective support of deranged physiology and occasionally psychology, through the provision of more advanced treatment at scene and en-route to hospital, including advances in airway management and other techniques for the most seriously ill and injured. However, the biggest gains, in respect of numbers of patients affected and in regard to financial benefits for the NHS, in particular, will accrue from the more effective response to patients presenting with undifferentiated, sub-acute or emergent clinical conditions.

It must be acknowledged that much more research effort in this area is necessary and that the evidence base to support these changes is still immature and incomplete, even inconclusive in some cases and much more remains to be accomplished. Nevertheless, the situation is an improving one and much of this improvement has been derived from

the efforts directed at improving the capabilities and skills of the paramedic workforce and numerous implementations of improved clinical practice in the UK and also, notwithstanding the difficulties in drawing comparisons, abroad. Indeed, the evidence base is now stronger than at any time previously, with the work of the US Medical Directors and others making it clear that emergency ambulance services staffed by paramedics can change patient outcome positively. Viewing the development of paramedics through the frame of reference of 'disruptive technologies' helps place into context the journey thus far and the possible future of the paramedic profession. Christensen is at pains to point out that even when knowledge moves clinical practice from the intuitive realm, thereby enabling a wider range of clinicians to deliver particular treatments and therapies, vested, often medical interest, will actively ridicule and reject such innovation at every opportunity.

While it remains difficult to determine the future for paramedics, even with the advantage of foresight techniques, it is now quite clear that elements of the UK medical profession's creation of a sub-speciality of pre-hospital medicine is, today, a reality. Numbers of these medical staff are increasing and any attempt to erect barriers that block paramedics from deploying certain key therapies and procedures represent examples of crude professional demarcation. There are also occasionally echoes of the 'dog in the manger attitude,' identified by Baskett (1991) and even sometimes thinly veiled attacks by medical 'whistleblowers,' e.g. Private Eye February (2013), deriding the development of 'super paramedics' and disingenuously linking such developments to the closure of hospitals and these can be expected to continue. The development of this sub-speciality

may sometimes be presented as an innovation in care, but as Rawlins (2012) observes, innovation, if cost ineffective, cannot be considered innovation at all, as far as the NHS is concerned.

Given the equivocal nature of the evidence of added benefit from the routine inclusion of medical staff in direct pre-hospital patient care the development of this medical sub-speciality does seem less reasonable, certainly when considering the financial implications. To some extent this desire seems to fall foul of the Italian futurist Umberto Eco's warning 'never fall in love with your own airship.' This cautionary advice harks back to an age when futurists incorporated fleets of airships into their predictions, airships subsequently proved to be poor investment; although no-doubt some enthusiasts remain. The prospect for fleets of jobbing 'would be' rescuer pre-hospital medical consultants do appear to be a likely, if far from preferable (from a paramedic or tax payer's perspective), expensive and medicalised future, created, as Freidson would undoubtedly attest, as a result of professional power, rather than based on logic, or the true merits of the argument.

As Turney (2010) notes, "there are no facts about the future" reminding the reader that the future has yet to be made and can be influenced. A combination of more coherent ambulance service and professional paramedic leadership that recognises the synergy between organisational and professional aspects could yet militate in favour of a more commonsensical future. Such a future is one in which education is at the core of professional development, thereby enabling scope of practice to morph and meet patient

need through thriving specialist practice, a culture of professional enquiry and engagement. Not therefore a radicalisation, more an awakening of patient care opportunities aligning with professional understanding and, to some extent professional interest too. There is some indication that this process is underway and the preferable future, again from a paramedic perspective, and possibly that of wider interest groups, might result. Nevertheless, even those with a charitable and optimistic nature cannot reject the prospect of a more mundane, less attractive ‘muddling through’ approach, as a less well-planned and more likely ‘probable’ future.

Chapter XI

Epilogue

In final summation of this thesis, this epilogue emphasises the many connections between what the literature says and the reality of what appears to be happening in practice today and what is likely to happen in the future. It highlights the key messages for policy and research and seeks to provide 'clarity of purpose,' again from the perspective of paramedics. The final section incorporates the very latest developments in relation to the report of Sir Bruce Keogh [Medical Director to the NHS] (2013), to whom some of the outputs of this research have been addressed both personally and in respect of a national steering group. It is in that sense a commentary on most recent events and gives grounds for optimism.

In terms of the key findings these can be expressed quite starkly for each of the two research phases. From the first section of the research it is clear that the workforce is, in the main, highly motivated to progress academically and that their motivation for doing so is inextricably associated with their desire to 'do more for patients.' This might not be considered an unusual finding, but it is seemingly a sincere one, unsullied by the question of additional financial compensation, which has become so bound up with the manner in which some professions ply their trade. Any leader of such a workforce could

not be unmoved by this outcome, particularly when one considers that this is [and this cannot be emphasised enough] essentially a very new workforce that has only very recently become 'professionalised.' It is also clear that there is a strong recognition as to the limitation of 'conventional' paramedic 'training' in particular. Perhaps even more importantly the 'workforce' seems to be well ahead of policy makers and their own ambulance sector leaders in terms of their ready acceptance that education is likely to be a pivotal factor in the successful development of the paramedic profession and its continued relevance to patients.

Yet as McCann's (2013) paper (addressed earlier) makes clear, paramedics are still 'blue collar workers' largely due to the constraints placed upon their practice. These constraints originate from a variety of sources and include; governmental targets, poor leadership within the 'ambulance sector' and a relatively small, but very active group with the medical community that is aggressively progressing its own aspirations in respect of 'pre-hospital care'. Conversely, many other medical practitioners have made great contributions to the development of paramedics, while much of the wider medical profession have shown little or no interest in what to them might well be considered peripheral activities.

What emerges from the literature and correlates well with the findings of the second stage of the research is that in a policy vacuum, what is left is something of a 'Dodge City' style free for all, with the relative power of the professions involved, becoming the principal determinants of what services are provided for patients. This is bad news for

the paramedic profession itself and for taxpayers in particular and reflects very poorly on both commissioners and the more senior professions, particularly elements within medicine, which in respect of the former have a duty to pursue service developments that represent both quality and value for money. While medicine, because of its immensely influential leadership position in health care could reasonably be expected to display objectivity and magnanimity. As for the other groups of potential alternative providers, these have, to an extent, been marginalised as illustrated in the results from Phase B of the Horizon Scanning Section.

It also shows those charged with leading the NHS in quite a poor light, given that policy has been lacking in this area, until early 2014. This rather negative dominant theme, which was discussed in some detail previously drawing upon Friedson's (1970) analysis, is unavoidable. The disturbing, almost dystopian conclusion is that professions are capable of either self-delusion, or at least a 'superiority illusion,' as previously concluded, or worse.

This may amount to an inadvertent or perhaps deliberate misleadingness, in the furtherance of partisan objectives, even when the clinical and service objectives that are being promoted could be achieved by other means. A more charitable interpretation could be that some individuals overly identify with their own professions. This is most obvious when considering the merits and de-merits of the Anglo-American or Franco-German models, with arguably the former being the more utilitarian in terms of clinical and cost effectiveness, although such a determination should not lead to a repudiation of

a multi-professional approach which remains a hallmark of good practice. It could however, perhaps be suggested that if evidence based practice and logic ruled, or indeed if the financial consequence of decisions were better appreciated, it is probable that the development of the paramedic profession would have taken place more rapidly and the contribution of paramedics could have been well in advance of the position found today in the UK and more on a par with that seen in the United States, Australia and other international examples.

If this reluctance to follow a more evidential approach is a salient theme, a conclusion that is not at odds with the literature review or the Horizon Scanning Process, or indeed the original findings from this research exercise, the paramedic profession has an even bigger problem than might have previously been imagined. Yet it would be wrong to end this section in a counsel of despair and there are some grounds for both cautious optimism and, indeed, for hope that the paramedic profession might yet overcome what appears to be a very dark position.

Two events in recent weeks give some grounds for such hope and both have been directly influenced by this research. First, the Sir Bruce Keogh review (2013) and the NHS Confederations Report (2014) give great prominence to the role of paramedics and the Ambulance Service in the NHS's future. Secondly, the case for paramedic independent prescribing has passed its first gateway, gaining approval from the senior management team of NHS England in April. These developments directly parallel the messages that have been derived from this research in that the paramedic profession is

a cost effective resource and one that the public, and now seemingly policy makers, are more willing to accept. If future research validates these beliefs and a much greater research effort in this area is essential, then the paramedic profession may yet reach, if not a land of milk and honey, then a more preferable future than might otherwise be the case.

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Appendix I

Information sheet to the Ambulance Service, Survey of Ambulance Personnel (Technician), Survey of Ambulance Personnel (Paramedic) Questionnaire Distribution

Information Sheet:

Participation in a Research Study Examining Training and Education for Ambulance Staff.

You are invited to participate in a study designed to evaluate the views and opinions of ambulance technicians and paramedics with regard to training and education.

Background Information

There are currently a number of developments nationally that seek to expand training and educational opportunities for ambulance staff and many of these involve Universities and employers. However, no large-scale assessment of the views of ambulance personnel has been undertaken in this area. Your views are important to future developments within our profession.

Procedure

If you are willing to participate, you need to complete the attached questionnaire and return it to me in the pre-paid, addressed envelope enclosed. Filling in this questionnaire will take about ten minutes of your time.

Risks and Benefits of Participating in the Study

It is not anticipated that anyone will experience distress as a result of participating in this study, however, if you do, then please contact your Employee Advice Service.

By participating in this study you will be contributing to the future direction of training and education for ambulance staff.

Confidentiality and Anonymity

To enhance anonymity, please do not put your name or other identifiable data on the questionnaire. All data collected will be managed in accordance with the Data Protection Act (1998).

Voluntary Nature of the Study

Participation in this study is completely voluntary. There are no right or wrong answers. I am interested in your views and opinions. For the purposes of this study filling in and returning this questionnaire will be taken as consent. There is no additional consent form to sign.

Thank you very much for considering taking part in this study. If you would like further information about any aspect of the study, please do not hesitate to email me at:
a.j.newton@herts.ac.uk

Yours sincerely,

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SECTION A

Survey of Ambulance Personnel (Technician)

Survey of Ambulance Personnel who either hold the Ambulance Technician[✈] [IHCD] Award or who have completed Ambulance Technician training and are undertaking their probationary year of clinical practice

Dear Colleague

This questionnaire has been developed at the University of Hertfordshire as part of a large scale study into the future development of ambulance personnel. The future of education, training and development of ambulance personnel is an important and topical subject which is receiving considerable attention by both employers and Universities.

Your views and insights will be important in this questionnaire which will take about 5 minutes to complete. Please answer every question and corresponding statements. This will help us to obtain the most accurate picture possible about the current position.

Section A1

For Office Use only

This section is designed to elicit information about you and your experience in the ambulance service.

1. How did you qualify *before* commencing Ambulance Technician Training?

	YES	NO	
Qualified as an Ambulance Care Assistant and worked in the Patient Transport Service or similar Non Emergency operation	❑	❑	1 2

[✈] Previous title - Qualified Ambulance Person, also known as Emergency Medical Technician

Qualified as an Emergency Medical Dispatcher and worked in ambulance control	❑	❑ 1 2
Joined the Ambulance Service as a 'direct entrant'	❑	❑ 1 2
Other. If yes, please specify: _____ _____	❑	❑ 1 2

2. How long have you worked as an Ambulance Technician in the Ambulance Service?

<1 year	❑	10-14 years	❑	25-29 years	❑	1 2 3 4 5 6 7 8
1-4 years	❑	15-19 years	❑	>30 years	❑	
5-9 years	❑	20-24 years	❑			

For Office Use only

3. Please indicate your age

< 21	❑	31-35	❑	46-50	❑	61-65	❑	1 2 3 4 5 6 7 8
21-25	❑	36-40	❑	51-55	❑	>65	❑	9 1 1 0 1
26-30	❑	41-45	❑	56-60	❑			

4. Are you male ❑ or female ❑ (Tick which applies) 1 2

5. In your view, how useful is training and experience as an Ambulance Care Assistant before undertaking Ambulance Technician training?
Tick one answer
YES

It should be mandatory	❑	1
It is of value in preparing staff for Ambulance Technician responsibilities, but should not be a compulsory prerequisite	❑	1

It is of little or no value in preparing staff to undertake Ambulance Technician responsibilities	❑	1
It is irrelevant and wasteful for those seeking a career as Ambulance Technicians	❑	1
Uncertain as to the value or otherwise	❑	1

Section A2

For Office Use only

The following section will ascertain how adequately your Ambulance Technician training prepared you to manage Category A, B and C patients. 1

Ambulance Technician Training:

Key	**Fully prepared me** **1**	**Largely prepared me** **2**	**Generally inadequate level of** **3**	**Completely inadequate level of** **4**	
6. Category A patients	❑	❑	❑	❑	1 2 3 4
7. Category B patients	❑	❑	❑	❑	1 2 3 4
8. Category C patients	❑	❑	❑	❑	1 2 3 4

Please check the statement that most closely fits your clinical practice

	YES	**NO**	
9. I work as part of an ambulance crew *with a colleague who is a paramedic*	❑	❑	1 2

If yes, please tick the amount of time this is for:

95% - 100% of the time	❑	50% - 74% of the time	❑	1 2 3 4 5
90% - 95% of the time	❑	< 50% of the time	❑	
75% - 89% of the time	❑	Not able to determine i.e. Bank Staff	❑	

YES **NO**

10. I work as a single responder in a fast response unit or similar vehicle ❑ ❑ 1 2

If yes, please tick the amount of time this is for:

95% - 100% of the time	❑	50% - 74% of the time	❑	1 2 3 4 5
90% - 95% of the time	❑	< 50% of the time	❑	
75% - 89% of the time	❑			

Section A3

For Office Use only

11. This section seeks your views regarding possible areas of the Technician curriculum that might benefit from greater emphasis

Key

	very satisfactory	Satisfactory	mostly	mostly	unsatisfactory	very
Excellent	**1**	**2**	**3**	**4**	**5**	**6** **Extremely poor**

How do you consider the current Technician course/ curriculum to be in respect of training in:

a.	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
b. Clinical patient assessment including physical examination skills	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
c. Assessment of patients' primary and social care needs	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
d. Ethics, Law and Professional Practice issues	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
e. Management of critical medical emergencies including cardiac resuscitation,	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6

f. Management of critical trauma emergencies	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
g. Pharmacology, over dosage of drugs, and poisoning	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
h. Management of psychiatric disorders	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
i. Management of obstetric emergencies	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
j. Management of Paediatric emergencies	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
k. Recognition of child abuse	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
l. Management of elderly patients	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
m. Management of major incidents	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
n. Management of hazardous materials	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
o. Management of aggression and violence	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
p. Use of technology	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
q. Management Health and Safety	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
r. Manual handling, etc	❑ ❑ ❑ ❑ ❑ ❑	
s. Understanding Evidence Based Practice	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
t. Information, research and study skills	❑ ❑ ❑ ❑ ❑ ❑	
u. Teamwork skills	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6

Section A4

For Office Use only

This section seeks information about how you feel training and educational opportunities could be developed for Ambulance Technicians and Paramedics

12. All ambulance technicians should enter programmes that automatically provide an opportunity to reach paramedic status

Agree ❑ Disagree ❑ 1 2

13. All paramedic training and education should be educationally accredited leading to a recognised qualification

Agree ❑ Disagree ❑ 1 2

14. If there were to be a standard academic qualification that incorporated Ambulance Technician status it should be at?

Please tick 3 and indicate priority, i.e. 1 - 3

A Certificate in Higher Education [equivalent to the first year of a degree programme and worth 120 academic credits at Level 1]	❑	1
A Diploma in Higher Education [equivalent to both the first and second years of a Degree programme and worth 240 academic credits, 120 at Level 1 and 120 at Level 2]	❑	1
Honours Degree (360 academic credits), similar to Allied Health Professionals and many nursing programmes	❑	1
No academic award is necessary	❑	1
None of the above	❑	1
Other (specify)	❑	1

15. If there were to be a standard academic qualification that incorporated both the Ambulance Technician and Paramedic requirements to achieve registration the combined award should be at?

Please tick 3 and indicate priority, i.e. 1 - 3

A Certificate level qualification e.g. below other Allied Health Professionals and nurses	❑	1
A Diploma or Foundation Degree e.g. similar to many nursing programmes	❑	1
The same level as all other Allied Health Professionals and some nursing programmes, e.g. a Degree level qualification	❑	1
A post-graduate qualification e.g. graduate entry level like many medical programmes	❑	1
No academic award is necessary	❑	1
None of the above	❑	1
Other (specify)	❑	1

16. Ambulance Technicians should be considered as 'pre-registrants' i.e. working toward paramedic registration

Tick which applies

Agree ❑ Disagree ❑ 1 2

17. What reasons would encourage you to enter Higher Education to study a programme linked to paramedic practice or related field.

	YES	NO	
Improve understanding of clinical care/ patient care	❑	❑	1 2
Use a wider range of therapeutic treatments and interventions	❑	❑	1 2
Would like to gain a recognised qualification	❑	❑	1 2
Improve promotion prospects/salary	❑	❑	1 2
Professional development reasons	❑	❑	1 2
Pressure from employer or other	❑	❑	1 2

18. Do you wish to add any further comments?

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE
(Completion implies consent)

SECTION B

Survey of Ambulance Personnel (Paramedic)

Survey of Ambulance Personnel who are Registered Paramedics

Dear Colleague

This questionnaire has been developed at the University of Hertfordshire as part of a large scale study into the future development of ambulance personnel. The future of education, training and development of ambulance personnel is an important and topical subject which is receiving considerable attention by both employers and Universities.

Your views and insights are important. This questionnaire will take about 5 minutes to complete. Please answer every question and corresponding statements. This will help us obtain the most accurate picture possible.

Section B1

For Office Use only

This section is designed to elicit information about you and your experience in the ambulance service.

1. How long did you work as an Ambulance Technician before undertaking your paramedic training?

<1 year	❑	10-14 years	❑	25-29 years	❑
1-4years	❑	15-19 years	❑	>30 years	❑
5-9 years	❑	20-24 years	❑		

1 2 3 4 5 6 7 8

2. How long have you worked as a paramedic?

<1 year	❑	10-14 years	❑	25-29 years	❑
1-4 years	❑	15-19 years	❑	>30 years	❑
5-9 years	❑	20-24 years	❑		

1 2 3 4 5 6 7 8

3. Please indicate your length of experience in the ambulance service combining your time as a Technician/ Paramedic and any other role you may have performed.

		10-14 years	❑	25-29 years	❑
2-4 years	❑	15-19 years	❑	>30 years	❑
5-9 years	❑	20-24 years	❑		

1 2 3 4 5 6 7

4. Please indicate your age

< 21	❑	31-35	❑	46-50	❑	61-65	❑	1 2 3 4 5 6 7 8
21-25	❑	36-40	❑	51-55	❑	>65	❑	9 1 1
								0 1
26-30	❑	41-45	❑	56-60	❑			

5. Are you male ❑ or female ❑ (Tick which applies) 1 2

Section B2

For Office Use only

6. Please comment on which area of the Technician & Paramedic curriculum could benefit from greater emphasis.

Please tick the box which describes your view.

Key

1	2	3	4	5	6
very satisfactory	Satisfactory	mostly	mostly	unsatisfactory	very

Excellent **Extremely poor**

How do you consider the current Technician course/ curriculum to be in respect of training in:

v.	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
w. Clinical patient assessment including physical examination skills	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
x. Assessment of patients' primary and social care needs	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
y. Ethics, Law and Professional Practice issues	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
z. Management of critical medical emergencies including cardiac resuscitation,	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
aa. Management of critical trauma emergencies	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6

bb. Pharmacology, over dosage of drugs, and poisoning	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
cc. Management of psychiatric disorders	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
dd. Management of obstetric emergencies	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
ee. Management of Paediatric emergencies	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
ff. Recognition of child abuse	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
gg. Management of elderly patients	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
hh. Management of major incidents	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
ii. Management of hazardous materials	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
jj. Management of aggression and violence	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
kk. Use of technology	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
ll. Management Health and Safety	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
mm. Manual handling, etc	❑	❑	❑	❑	❑	❑						
nn. Understanding Evidence Based Practice	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
oo. Information, research and study skills	❑	❑	❑	❑	❑	❑						
pp. Teamwork skills	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6

Key

	very satisfactory	Satisfactory	mostly	mostly	unsatisfactory	very	
Excellent	**1**	**2**	**3**	**4**	**5**	**6**	**Extremely poor**

How do you consider the current Paramedic course/ curriculum to be in respect of training in:

a.	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
b. Clinical patient assessment including physical examination skills	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6
c. Assessment of patients' primary and social care needs	❑	❑	❑	❑	❑	❑	1	2	3	4	5	6

d. Ethics, Law and Professional Practice issues	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
e. Management of critical medical emergencies including cardiac resuscitation,	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
f. Management of critical trauma emergencies	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
g. Pharmacology, over dosage of drugs, and poisoning	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
h. Management of psychiatric disorders	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
i. Management of obstetric emergencies	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
j. Management of Paediatric emergencies	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
k. Recognition of child abuse	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
l. Management of elderly patients	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
m. Management of major incidents	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
n. Management of hazardous materials	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
o. Management of aggression and violence	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
p. Use of technology	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
q. Management Health and Safety	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
r. Manual handling, etc	❑ ❑ ❑ ❑ ❑ ❑	
s. Understanding Evidence Based Practice	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6
t. Information, research and study skills	❑ ❑ ❑ ❑ ❑ ❑	
u. Teamwork skills	❑ ❑ ❑ ❑ ❑ ❑	1 2 3 4 5 6

Section B3

For Office Use only

This section seeks information about how you feel training and educational opportunities could be developed for Ambulance Technicians and Paramedics

7. All new entrant ambulance technicians should enter programmes that automatically provide an opportunity to reach paramedic status

Agree ❑ Disagree ❑ 1 2

8. **All paramedic training and education should be educationally accredited leading to a recognised qualification**

Agree ❑ Disagree ❑ 1 2

9. If there were to be a standard academic qualification that incorporated Ambulance Technician status it should be at?

Please tick 3 and indicate priority, i.e. 1 - 3

A Certificate in Higher Education [equivalent to the first year of a degree programme and worth 120 academic credits at Level 1]	❑	1
A Diploma in Higher Education [equivalent to both the first and second years of a Degree programme and worth 240 academic credits, 120 at Level 1 and 120 at Level 2]	❑	1
No academic award is necessary	❑	1
None of the above	❑	1
Other (specify)	❑	1

10. If there were to be a standard academic qualification that incorporated both the Ambulance Technician and Paramedic requirements to achieve registration the combined award should be at?

Please tick 3 and indicate priority, i.e. 1 - 3

A Certificate level qualification e.g. below other Allied Health Professionals and nurses	❑	1
A Diploma or Foundation Degree e.g. similar to many nursing programmes	❑	1
The same level as all other Allied Health Professionals and some nursing programmes, e.g. a Degree level qualification	❑	1
A post-graduate qualification e.g. graduate entry level like many medical programmes	❑	1
No academic award is necessary	❑	1
None of the above	❑	1
Other (specify)	❑	1

This Section seeks your views on extending paramedic practice and the possible future roles of paramedic practitioners

For Office Use only

12. Emergency Care Practitioners are being developed in many ambulance Trusts. Please indicate your views as to how their roles and skills should be developed

Emergency Care Practitioners should be developed around the needs of:

	YES	NO	
• Category 'A' patients	❑	❑	1 2
• Category 'B' patients	❑	❑	1 2
• Category 'C' patients	❑	❑	1 2
• Don't know	❑		1

13. What reasons would encourage you to enter Higher Education to study a programme linked to paramedic practice or related field.

	YES	NO	
Improve understanding of clinical care/ patient care	❑	❑	1 2
Use a wider range of therapeutic treatments and interventions	❑	❑	1 2
Would like to gain a recognised qualification	❑	❑	1 2
Improve promotion prospects/salary	❑	❑	1 2
Professional development reasons	❑	❑	1 2
Pressure from employer or other	❑	❑	1 2

14. The current Technician course is entirely satisfactory and sufficient for the needs of Ambulance Technicians

Please tick your agreement/disagreement

Strongly Agree ❑ Agree ❑ 1 2 3 4 5
Neutral ❑ Disagree ❑
Strongly Disagree ❑

15. Do you wish to add any further comments?

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE (completion implies consent)

SECTION C

Questionnaire Distribution

Questionnaire Distribution

Area	Technician	Paramedic
Avon	30	30
Bedfordshire & Hertfordshire	40	40
Royal Berkshire	30	30
Coventry and Warwick	40	40
Cumbria	30	30
Dorset	30	30
East Anglian	60	60
East Midlands	60	60
Essex	40	40
Gloucestershire	30	30
Hampshire	40	40
Hereford & Worcester	30	30
Isle of Wight	10	10
Kent	40	40
Lancashire	40	40
Lincolnshire	30	30
London	90	90

Greater Manchester	60	60
Mersey Regional	60	60
Northern Ireland	40	40
North East	60	60
Oxfordshire	30	30
Scottish	70	70
South Yorkshire	40	40
Staffordshire	30	30
Surrey	40	40
Sussex	40	40
TENYAS	40	40
Two Shires	40	40
Welsh	70	70
West Country	60	60
West Midlands	60	60
West Yorkshire	60	60
Wiltshire	30	30
Total	**1500**	**1500**

Appendix II

A Discussion Paper on the Future of Education, Training and Development for Emergency Ambulance Staff, prepared for the Ambulance Education and Training Advisory Group of the ASA

1. Introduction

This discussion paper seeks to examine the traditional training routes and explore the limitations of current training and development approaches operating in the UK ambulance service today. It will also propose a strategy that will enable ambulance personnel to adopt a more educationally sound and systematic route of personal and clinical development more appropriate to the needs of the 21st century.

The format of the paper is:

1. Background
2. The Case for Adopting a Higher Education Approach
3. Meeting the Professional and Educational Challenges
4. Key Findings
5. Recommendations
6. Appendix 1 Career and educational framework
7. Appendix 2 Current Universities and existing programmes

2. Background

2.1 The NHS Plan sets out a number of core principles as a framework for achieving a modern NHS. These include shaping and modernising services around the needs and preferences of patients, improving quality and supporting staff to make their best contribution through recognition, reward and investment in education and training.

2.2 The HR in the NHS Plan sets out a comprehensive strategy for growing and developing the NHS workforce to meet the challenges in the NHS Plan. Key pillar of the strategy is the skills escalator, which is encapsulated in the four modernisations – workforce planning, pay, regulation, and learning and personal development. The Modernisation Agency and the Workforce Development Confederations are tasked with planning and supporting delivery of these at ground level. The key elements, which are required for the modernisation of learning and personal development, include strengthening health and education sector partnerships and redesigning established education and training programmes to reflect changes in roles and patient care services. The modernisation of regulation proposals in the strategy place increasing demands on health care professionals to provide safe and high quality care.

2.3 Pre-hospital care is changing and nowhere will these changes be more profound than in the education of paramedics, a group that, as Sir Kenneth Calman recently acknowledged, had failed to benefit from the expansion of opportunities in higher education readily embraced by other health care professionals. Paramedics achieved registered status with the Council of Professions Supplementary, to Medicine, CPSM, [now superseded by the HPC] in November 2000. Inevitably this act of recognition is catalysing further developments. These are likely to include a move to higher entry standards, a longer more intensive period of preparation for greater responsibilities within an expanding and more complex role.

2.4 The education sector is also undergoing a period of change and expansion principally through the medium of the new 'Foundation Degree'. These new awards incorporate 240 credit points and are therefore identical in credit value to the current Diploma in Higher Education, but with a stronger vocational orientation. The strategic significance of this development is related to government policy that seeks to increase participation rates in tertiary education from the current 43 percent of school leavers, up to 50 percent within this decade. The significance of this move for ambulance staff is striking, because Foundation Degrees appear to be well suited to the needs of paramedic preparation incorporating both scholastic and technical competencies and countering the prejudice that has led to a gulf between academic and skills based knowledge. Embracing higher levels of education and training is a natural and inevitable consequence of the professionalising process that should logically also promote improved, evidenced supported patient care outcomes.

2.5 The Department of Education and Employment have already identified several industries as likely 'early adopters' of Foundation Degree initiative, including the information technology, financial services, media and sport sectors, and most significantly, "health professions". In each case it will be necessary for interested parties to form consortia that will be comprised of at least one HEI with degree awarding powers in combination with at least one employer.

2.6 The proposed model appears to have considerable relevance for the preparation of ambulance personnel and has the potential to develop into nationally applicable arrangements for all aspiring paramedics as well as for a proportion of existing ambulance personnel at both the technician and paramedic level. The first example of the new programme for the preparation of paramedics is already underway at the University of Hertfordshire, which had already pioneered a full-time and part-time BSc programme for new entrants and existing ambulance staff. While gaining experience in delivering conventional degree awards it was realised that accessing full honours degrees would probably not be a feasible option in the near or medium term. The Foundation Degree appeared highly relevant and, in consequence, a consortium of 4 ambulance Trusts have formed to deliver the course on a partnership basis. This arrangement allows the strengths of all parties to be merged into a single integrated education and training programme.

3. The Case for Adopting a Higher Education Approach

3.1 In January 2000 JRCALC published a consultation document that encouraged the development of a 'Practitioner in Emergency Care, PEC. This new grade of staff would be prepared for their role through a combination of both education and training offered at undergraduate level and would *"optimise the clinical care and safety of patients in the pre-hospital arena".* This was an important document that fully acknowledged and endorsed the need to place greater emphasis upon the role of education for at least a proportion of paramedic staff. Furthermore the proposals are consistent with the NHS Plan and the new emphasis on improving the quality of all health services and the comments of the Audit Commissions who argued for a "much greater depth of understanding in basic medical sciences".

3.2 While being generally well received there have been dissenting voices such as Wood (2000) who, quoting the JRCALC papers' statement ***"paramedic training does not provide the underpinning education for sound clinical judgement to be exercised or indeed expected"*** raising the valid question ***"why should it be continued?"***. Perhaps the more appropriate question is what is the most logical level at which to conduct *all* general paramedic training?

3.3 This is likely to become a key and pressing question given the fact of paramedic registration and the reality of European Directives. Paramedics appear to fall under Directive 92/51 that identifies both the level of educational award acceptable for regulated professions and the expected educational prerequisites considered

acceptable to access approved educational courses leading to registration. Currently there appears to be discrepancies and shortfalls in regard to both issues in respect of the current arrangements for training paramedics. These are brought into even sharper focus with the advent of new 'Standard of Proficiency' produced by the HPC with the help of the Quality Assessment Authority.

3.4 Most people now accept that education can extend and enhance an individual's ability to organise and learn, whereas training is more focused on acquiring a specific skill. When comparisons are drawn between the training of paramedics and other registered health professions there is a sharp and very evident educational divide. This fact has not gone unrecognised with several organisations, including the Chief Executive of the Ambulance Service Association, acknowledging that the move to higher education is desirable.

3.5 This view has been strongly endorsed by both those working in education such as Jones, Cookson and Battersby who recognise that a more comprehensive educational experience for paramedics is required with a move away from protocol directed care as recently exemplified by the latest version of the JRCALC 'Guidelines.' There is also a close relationship with patient safety with the Wells report into the London Ambulance Service and specifically the death of Nassina Begum, recognising that protocol based practice was "no longer sufficient" and that a more "holistic" approach [to patient care] was required. Such objectives are only realistically achievable when accompanied with a radical enhancement of paramedic training and the embracing of a more educational approach.

3.6 Paramedic training programmes place a high value on 'get the job done' no nonsense practical skills and have become increasingly crowded as new items of equipment and techniques are added to the course. By definition they under-emphasise the relationship between theory and practice and have been recognised in educational psychology terms as being insufficient to produce workforce success. One Ambulance Service Chief Executive to 'adding too many Lego bricks to the paramedic' has likened this phenomenon and encouraging him to 'fall over,' an accurate but hardly edifying outcome that most would wish to avoid.

3.7 Adding new techniques without the underpinning background knowledge and without recourse to critical thinking and problem solving approaches that link theory and practice is simply outmoded. The value of providing a broader based preparation helps students to understand why a particular medical crisis is occurring, to make more accurate assessments of patient need, to select appropriate treatments and to anticipate a patient's response to treatment. These are essential abilities in a quality and risk conscious environment. They are a function of knowledge of physiology, the basic medical sciences and increasingly an understanding of systems and human factors.

3.8 There is simply insufficient time to consider these factors within the current training regimens and, often, insufficient expertise to deliver such material. It is telling that ambulance staff generally, and paramedics in particular, are the only group in the NHS with significant clinical responsibilities, to be prepared for their role without the benefits of higher education.

3.9 Indeed, the most common form of preparation via the existing route is identical in duration, and similar in content [at least at the Ambulance Technician level] to the original recommendations of the 1966 Millar report, which was the first attempt to develop standards for ambulance personnel in the UK. Some ambulance training schools have slightly increased the duration of these courses, but this is little more than a 'finger in the dyke response' to a much more deep-rooted problem.

3.10 The paramedic element [approximately 300 hours in duration] has been revised recently. Nevertheless, it is still not comparable with other health care professions and was described in the JRCALC submission as being "relatively modest" – and therefore insufficient to ensure consistently safe levels of clinical judgement or, by implication, practice. Interestingly, the Council of Europe's *"Comparative Study of the Organisation and Functioning of Emergency Medical Assistance Services* – 1990" found that the training of most ambulance personnel in Europe "usually lasts about 500 hours".

3.11 In many of the countries examined, ambulance personnel were supported by medically qualified staff and did not therefore have the full extent of responsibilities assigned to UK ambulance staff who remain the 'backbone' of this country's pre-hospital care provision. In the thirteen years since the Council for Europe's paper, several EU countries, particularly those without a surfeit of medical labour, have increased the scope of paramedic training and education significantly in line with developments in the United States and many Commonwealth countries. Notably the American 'EMS Agenda for Change' and the partner publication 'EMS Education Agenda For The Future' draw precisely these conclusions and make a strong case for upgrading paramedic education and training as the cornerstone of raising the quality of emergency ambulance services. The situation regarding the duration, content and educational level of UK ambulance staff would, in the context of the current situation, appear untenable and entirely unsustainable.

3.12 This situation is compounded by a failure to take full advantage of the new national clinical guidelines that have been developed by JRCALC. These evidence-based clinical guidelines represent a significant leap forward in terms of patient care and should logically become a significant part of the core or foundation for paramedics, upon which training and educational programmes could be developed.

4. Meeting the Professional and Educational Challenges.

4.1 In the DoH "Meeting the Challenge: A Strategy for the Allied Health Professions" [November 2000], the desire to explore new ways of working and preparing staff is acknowledged. The following comment is made:

"...The NHS Executive is working with the Joint Royal Colleges Ambulance Liaison Committee to review professional education and examine the scope for developing practitioners able to work flexibly in a variety of settings to deliver emergency care. This requires partnerships working between employers and educators, particularly in the provision of high quality learning, practice and placements [section 4 – Modernising Education Training and Regulation page 24]

4.2 For this vision to be realised several key steps will need to take place. Firstly, both leaders of Ambulance Trusts and paramedics at all levels will accept the sometimes painful view that the current arrangements are 'time expired' and no longer appropriate for modern health care in the 21st Century. It will also be necessary to develop new partnerships to deliver redesigned programmes that are predicated on a different philosophy and have a much wider breadth and depth of curriculum.

4.3 It must also be noted that one of the factors that would facilitate such a development would be a strong professional body to engage in the debate, and address specific issues such as entry standards, pre-registration education and training criteria, continuing professional development and scope of practice issues. Some of these issues are particularly pressing and, without such representation, and the accompanying mechanisms to ensure development, the process will continue to be severely hindered.

4.4 Even if the above issues can be adequately resolved, the matter of the role of ambulance technicians must also be considered. This grade of staff represents over 40% of the Accident and Emergency ambulance service's workforce and operates completely outside of any foreseeable registration structure, although the HPC's mandate does in fact include a clause that gives it a legitimate role in determining technician training content. Given the purpose of registration is protection of the public, having a large proportion of ambulance personnel in this position is inconsistent with the current approach for paramedics.

4.5 One solution would be to incorporate a recognised stepping off point within an HE programme at Certificate of Higher Education level as the standard for *the assistant practitioner* or Technician grade. This would also be consistent with the development of assistant practitioners in other professions within the HPC. Concurrently, it would be reasonable to increase the proportion of the ambulance workforce trained paramedics but educated to the Foundation Degree level. This might necessitate a restructuring of the paramedic skills envelope with perhaps a greater emphasis on patient assessment and underpinning knowledge accompanied with a revised skill set. This might involve replacing certain techniques that are performed infrequently such as endotracheal

intubation with the laryngeal mask airway and limited use of certain medications that are used infrequently.

4.6 A higher-level PEC or Senior Paramedic Practitioners, who would have completed higher level programmes, such as full graduate or post-graduate courses would be augmented with a range of additional skills. There may also be a case for developing a new support worker whose function would be similar to the existing ambulance person/care assistant. This individual would have responsibilities ranging from 'first response' to the care of patients categorised at the intermediate care level. The NHS, voluntary sector and possibly the Fire Service could potentially access this qualification.

4.7 In future, this could result in aspiring paramedics undertaking a Foundation degree as part of the standard credentialling and registration process with those wishing to function at the 'PEC' grade taking one further year of study to reach full degree status. Such a model of preparation would be likely to meet the implied requirements of upgrading educational attainment for all new paramedic staff in keeping with newly acquired registered health professional status.

4.8 This approach would also be in keeping with health policy such as "Reforming Emergency Care." This document envisages an "extended role" for ambulance staff who are to be allocated increased responsibilities in respect of patient assessment using technologies such as Clinical Decision Support Software, termed the Clinical Assessment System, CAS, to assist in enabling this expansion of skill base.

4.9 The Ambulance Service Association's recent publication *The Future of Ambulance Services* acknowledges the central role that education will play in preparing ambulance personnel for a wider role. The issue of the Practitioner in Emergency Care is discussed and recognised as essential in meeting wider clinical and operational challenges.

"PECs represent one response to the heterogeneity of the demands placed upon the emergency Ambulance Services. Thus PECs have a duel role – to provide pre-hospital assessment, triage and home care if appropriate for less immediate problems … it is likely that the concept of PECs will be implemented."

4.10 There is a growing consensus that the attainment of higher levels of service delivery will be dependent upon improvements in operational systems, improved technology and in the academic preparation of ambulance staff. Ambulance personnel with greater capabilities in respect of patient assessment and patient management will be one of the keys to unlocking the ambulance services' full potential as an increasingly important part of the health economy. This adds up to more and hopefully better education and training.

4.11 Funding for such an initiative is currently inadequate if confined to that part of an Ambulance Trust's budget dedicated for training purposes. However there are other sources of financial resources for HE based training, including the Higher Education Funding Council (HEFC), and the Work Force Development Confederations, WDCs. There are examples within HE where all three funding sources have been used to support programmes. Nevertheless, few ambulance services have attempted to pursue this route and consequently it is common to hear the refrain that a lack of funding is hampering the development of new programmes.

4.12 If these new arrangements were developed the 'career trajectory' of ambulance personnel, and paramedics in particular, could be developed in line with the proposals outlined in the DoH *Strategy for Allied Health Professionals.* The paramedic, in keeping with all the other registered Allied Health Professionals, could progress from newly qualified provider status to the proposed higher grades. This type of career progression could be linked with a Practitioner in Emergency Care, PEC, initiative, now usually termed the 'Paramedic Practitioner', PP. The PP could indeed become a clinical provider operating in a variety of patient care settings with a similar, if somewhat more modest, scope of practice to that of the American 'Physicians Assistant,' PA.

4.13 Expanding the scope of practice of paramedics presents very real opportunities to address some of the labour shortages assailing the NHS. Paramedics are one group that has plenty of applicants, and by extending the role it could be argued that it could become an even more attractive career choice. Several Ambulance Trusts are already experimenting with arrangements that locate paramedics within Primary Care settings working to the requirements of the local Medical Practitioners, who occasionally travel with the paramedic to provide supervision and training.

4.14 It is important to note that proposals that seek to conform to the DoH view, that extending scope of practice or operating in non traditional parts of the NHS should not be dependent upon obtaining duplicate registrations, as this would be counter to a more flexible workforce. It naturally follows that courses designed to prepare paramedic students should be based upon a single registration model. This principle is important given the current evolving status of paramedic education and any other approach would be destabilising.

4.15 Such services can also provide a first response to local 999 calls. The front page of the Times in early 2002 showed the Queen Mother being attended by such a scheme at Sandringham. Several services have pioneered similar schemes including the Staffordshire Ambulance Trust's Community Paramedic Officer scheme that has been working successfully for a number of years. These ideas could be developed with a wider range of urgent assessments being conducted by the Paramedic Practitioner/PA, an idea also being advocated in the United States to enable Paramedics to react to the ever-increasing proportion of their workload that is not specifically 'emergency oriented.' However, wider education is the key to unlocking this potential because,

without more detailed preparation, appropriate assessment and treatment of patients is unlikely to be successful.

4.16 The scope of practice of the Senior Paramedic, Paramedic Practitioner/PA would logically be somewhat wider than envisaged for the Foundation Degree prepared paramedic and would necessitate further study to full degree level. It may prove to be of value to modify the existing paramedic skills base extending the assessment capabilities and the treatment options available for minor illness and injury management in keeping with the new capabilities offered with the advent of Clinical Decision Support Software, within the Foundation Degree structure. This would be developed further for those progressing to Paramedic Practitioner/PA status. Physician Assistants are a well-established and valuable part of the health care landscape in the United States where there are in excess of 45,000 practitioners functioning as "mid level" providers under the direct control and responsibility of Medical Practitioners.

4.17 A little further in the future it is conceivable that Paramedic Practitioner/PA's could increasingly specialise. This may lead to the type of diversity witnessed in the United States where some paramedics work relatively autonomously with only remote medical supervision in areas such as critical care transportation, others in hospital Emergency Department, wards and in Primary Care.

4.18 The opportunities raised by the emerging framework for Agenda for Change, which is a key pillar of the HR in the NHS Plan document, will enable reward to be linked to knowledge and skills bases and that pay progression will be linked to achievement of competencies. The NHS will have the ability to evaluate these levels in a fair and transparent way as and when services change, and the contribution which staff make also changes. A consequence of this may be that staff will be more willing to seek out development opportunities. Career pathways can exist from the lowest to expert practitioner level with gateways in and out to other professional work at a number of levels.

4.19 There will be issues about the links that PTS staff will have into and through the skills escalator. Clearly there is a need to identify those competencies to be learned and assessed at the local Trust level. Given the support that is now available from WDCs, who are working with Learning and Skills Councils (LSCs), it may be that establishing NVQ routes could provide an appropriate link to the higher education model thereby creating a system with multiple entry points and contributing to increasing opportunities.

4.20 Ultimately the quality of care patients receive is closely related to the extent, quality and philosophy of the education and training received by ambulance technicians and paramedics. As with many areas of health care, it is now opportune to 'modernise' this important element of service delivery. Newly developing programmes will need to be guided by patient and service need while also remaining national in scope driven by standards and guidelines to ensure consistency. It will also require sound partnership working between not just paramedics, but also employers, regulators, educators,

educational institutions and the medical profession. These developments should be guided by a firm commitment to evidenced based health care and can be expected to produce a practitioner with a broader range of competency extending beyond the technical and behavioural necessities catered for within traditional training. The outcome of such change should also militate in favour of fostering a professional identity with all the associated positive benefits and responsibilities.

4.21 In conclusion paramedics, and indeed a wide range of ambulance service staff, are entering a period where opportunities for enhanced professional development are increasing at an almost expediential rate. This situation is no accident and has been caused by a confluence of factors ranging from the modernisation agenda within the NHS, the professional registration of ambulance paramedics, and changes in government policy designed to increase participation rates in higher education coupled to wider changes in society and in technology. Collectively this adds up to a serendipitous combination that bodes well for the NHS, paramedics and patients.

5. Key Findings

5.1 General

* The current ambulance training systems and programmes are no longer fit for the required purpose

5.2 Specific

* The emphasis on clinical effectiveness and evidenced supported health care is not adequately reflected in either the ambulance technician or paramedic regimens

* The JRCALC national clinical guidelines need to be the core of all technician or paramedic training and this is not the case at present.

* Current training systems are non-compliant with EU Directives

* Paramedics are the only Allied Health Professionals without HE based education

* There is a need to establish effective professional representation

* A career structure needs to be developed with an accompanying educational framework incorporating a ‘skills escalator’ model

* Basic pre-registration preparation should be provided at the Foundation Degree/ Diploma level, with progression to graduate and post-graduate qualification that are linked to Senior Paramedic Practitioner level grades

* There is a case for upgrading existing paramedics though to Foundation Degree/ Diploma level with the technician level becoming an 'assistant practitioner' grade at Certificate of HE level

* There may be a case for the creation of an ambulance support worker, incorporating driving, first-response and intermediate care skills; this training, possibly at Edexcel/IHCD BTEC or NVQ level and might be accessible by NHS, military, voluntary, fire service and private sector ambulance staff.

6. Recommendations

6.1 General

* Acting with a legitimate employer's interest and in the absence of an established professional body to represent paramedics or indeed technicians, the ASA should consider a number of urgent actions

6.2 Specific

* Short term: Instigate a requirement that current Edexcel/IHCD programmes are integrated into an HE provision as ambulance aid modules

* Medium term: On a phased basis, withdraw from the current Edexcel/IHCD training programmes and develop [with IHCD assistance and support] a new practically focused ambulance aid skills module, possibly utilising BTEC modules that captures the best aspects of the current arrangements and integrate these into an educational based programme

* Short term: Adopt and support rapid implementation of tailored Foundation Degree or equivalent level qualification, with a syllabus that incorporates the clinical contents of the JRCALC clinical guidelines. These programmes should be developed in partnership with NHS Trusts and higher educational establishments and would represent the basic pre-registration qualification for all new paramedics

* Support the Department of Health's philosophy that individuals should work towards the acquisition of a single registration and then function in any area of the NHS based on their registration and the associated competencies

* Encourage multi-disciplinary training and educational opportunities but support only those courses that are consistent with the above principles of a single registration model

* Develop an educational framework for the development of future paramedics and practitioners that can be embraced nationally and that incorporates a 'skills

escalator' concept, linking individual scope of practice, competency and a progressive system of educational qualifications

* Ensure that conversion programmes are available for those staff who are able and willing to access academic awards

* Aid the development of a professional representative body for paramedics

* In the absence of a strong professional body, the ASA should enforce minimum educational entry standards, for example 5 GCSE's at grade C or above, and determine other appropriate selection criteria that can be applied on a national basis.

* Consider development of a new 'ambulance support worker' that offers a range of skills including first response, driving and intermediate care skills similar in scope to an ambulance person, but probably encapsulated within a IHCD BTEC award structure. Such a qualification could be accessed by NHS and non-NHS personnel alike.

7. Conclusion

7.1 The enthusiasm with which ambulance service personnel in the United Kingdom have embraced new training opportunities, particularly those linked to clinical proficiency during the last 3 decades, demonstrates an appreciation as to the value of personal development. Of equal importance is the capacity of the ambulance service to become increasingly integrated into the NHS health economy and to deliver service improvements that mirror national health policy initiatives. This objective is largely dependent upon an increasingly skilled workforce.

7.2 Modern ambulance services are required to deliver more than protocol based immediate aid and simple treatment and transportation to the nearest hospital, often just to find out that the patient doesn't actually need to be there. The trend of increasing demand, not just in terms of volume, but also complexity, will require tomorrows, and indeed many of today's, paramedics to become more credible and capable. This is a challenge that paramedics will prove equal to, not because it is easy, but because it is a hard and necessary waypoint on the road to increasing professionalism.

7.3 In the immediate future the opportunities presented by the new Foundation Degree can provide a medium to facilitate this journey, bringing the benefits that accompany wider access to education. For some individuals, progression to full degree status would be accompanied by wider clinical responsibilities. These Senior Paramedic Practitioners/Physician Assistants will work in a wider variety of clinical settings providing care and treatment as part of a more imaginative response to the challenges of providing modern health care.

Appendix III

Articles taken from the

Journal of Paramedic Practice Magazine

Appendix IV

Agenda of Clinical Care (DOCC) Meeting;

The Paramedic Practitioner and the ECP Doppelganger

AGENDA

DIRECTORS OF CLINICAL CARE (DOCC) MEETING

Details: **16 October 2007 from 2:00 to 5:00pm**
Holiday Inn Regents Park (Trinity Suite), Carburton Street, London, W1W 5EE

Members:	John Stephenson	*JSt*	East Midlands *(Chair)*
	Tom Clarke	*TC*	North East *or*
	Kevin McKenna	*KM*	North East *or*
	Colin Cessford	*CC*	North East
	Kevin Mackway-Jones	*KMJ*	North West
	Alison Walker	*AW*	Yorkshire
	Matthew Wyse	*MW*	West Midlands
	Ossie Rawstorne	*OR*	Great Western
	John Scott	*JSc*	East of England
	Fionna Moore	*FM*	London
	Gillian Bryce	*GB*	South Western *or*
	Norma Lane	*NL*	South Western
	Fizz Thompson	*FT*	South Central
	Jeremy Mayhew	*JM*	South East Coast *or*
	Andy Newton	*AN*	South East Coast
	Mick Colquhoun	*MC*	Wales
	George Crookes	*GC*	Scotland
	David McManus	*DM*	Northern Ireland
	Paul Phillips	*PP*	Chief Executive, EMAS *(CE Link)*
	Fiona Jewkes	*FJ*	ASA Clinical Lead

	Agenda Items	Attachments	Raised by
1	**Apologies:** *Received from GB, DM, CC*	-	*Chair*
2	**Minutes of the Last Meeting:** *Held on 11 July 2007*	*Paper 1*	*Chair*
3	**Matters Arising** *- Treat and Leave Strategies Update (KMJ/MW/JM)* *- The Paramedic Practitioner and the ECP Doppelganger (AN/JM)*	*Paper 2*	*Chair*
4	**DOCC Terms of Reference and Work Programme**	*Paper 3*	*JSt*
5	**DOCC Chairing Arrangements**	-	*JSt*
6	**Air Ambulance Operations**	*Papers 4 a+b*	*JSc*
7	**Clinical Supervision**	-	*JSt*
8	**Stroke Care Pathways**	-	*FT*
9	**Major Incident: MIC and Merit Current Status**	-	*JSt / JSc*
10	**PMETB Application for Sub-speciality Recognition Titled Pre-hospital and Retrieval Medicine by the Faculty of Pre-Hospital Care**	-	*JSc*
11	**Regional Faculty Structure**	-	*JSc*
12	**Role of Doctors with Ambulance Trusts / Creation of Regional Care Centres**	*Paper 5*	*JSc*
13	**Pre-Hospital Anaesthesia**	*Paper 6*	*JSc*
14	**Mechanical Resuscitation Group Update**	-	*PP*
15	**Standing Item: Clinical Serious Untoward Incidents (SUIs)**	-	*All*
16	**Standing Item: ASA Update** *(Fiona Jewkes)*	-	*FJ*

17	**Current Short Hot Topics:** *By prior notification*	-	*All*
18	**Any Other Business:** *By prior notification* *- Dr James Gray, Yorkshire Ambulance Service – Authorisation to receive DOCC minutes and publish on UKAAG Google site for group to read. (JSt)* *- Audit Group, 30/10/07 – DOCC Representation (JSt)* *- NIAP and Cardiac Networks Meeting (JSt)*	*Papers 7 a+b*	*All*
19	**Details of the Next Meeting:** *Wednesday 5 December, 12:00 to 16:30, Conference Room, London Ambulance Service HQ.*	-	*Chair*

Meeting administration: Thom Hall, 01773 522655, thom.hall@emas.nhs.uk

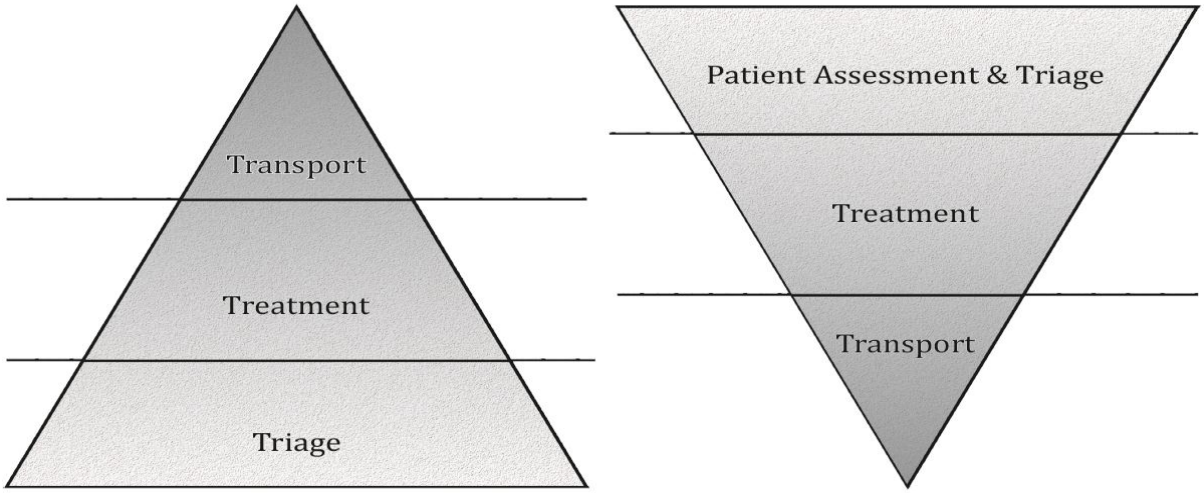
FOR INFORMATION:

18:00, 16 October to 14:30, 17 October 2007
Ambulance Leadership Forum, Holiday Inn, Regents Park, London.

15:00 to 16:00, 17 October 2007
STREAM Meeting.
Tom Quinn and hopefully Tony Gershlick and/or Bob Wilcox will attend for the trial steering group.

The Paramedic Practitioner and the ECP Doppelganger, What's the Difference?

The clinical concept of operation for the UK Ambulance Service is changing radically and evolving at an increasing pace with greater emphasis upon clinical rather than the historical transport function. This trend, which started accelerating from the 1970s, when the first Paramedics (then termed extended trained ambulance staff) were developed has followed a course of expanding the clinical capability of ambulance crews. In essence this means a fundamental change in priorities with patient assessment, treatment and where necessary referral becoming more common, with less demand for transport. This trend is illustrated using the diagrammatic representation below:



The clinical ramifications of these changes are substantial, both operationally and in regard to professional issues for Paramedics, upon whom a range of increasing responsibilities fall. In reality this evolution in role has been led by patient demand and reconfigurations within the wider NHS, particularly those that have affected General Practice, including the amendments in the contractual obligations of GPs. All of these changes have taken place against a background of escalating 999 call volumes which have increased from approximately one million in 1966 to nearly six million today, with a massive increase in the order of 100% occurring between 1996 (3.2 million) and 2006. Essentially, the Bradley Report (2005) *Taking Health Care to the Patient* has made a virtue out of necessity and recommended that the Ambulance Service take on the responsibilities of a mobile health care provider, with the broad objective of reducing the number of patient transports to hospital by approximately 25%, or roughly 1.000.000 journeys per annum.

These objectives are not new, Professor Chamberlain as Chair of JRCALC in partnership with the ASA in 2000 created 'Practitioner in Emergency Care,' or PEC initiative. The rationale for this development was based on the recognition that the demands being placed upon Ambulance Services had changed from a traditional view that all 999 calls represented hyper-acute emergencies to one where many less serious

‘undifferentiated’ primary care type cases dominated the case mix. The role of the PEC was designed to ‘up-skill’ the workforce and support modernisation efforts, moving towards an Ambulance Service that could evolve into a “mobile health care service.’ The PEC contribution to this modernisation was described thus:

> *“The needs of patient care and of the service could best be met by a higher level of paramedics, perhaps 30% of the total...’*

The Ambulance Service Association, ASA document ‘The Future of Ambulance Services in the United Kingdom’ strongly supported the idea that ambulance services should move from ‘bringing patients to services to bringing services to patients,’ and went on to comment that ‘professional *registration and the development of the idea of PECs suggest that many [staff] are keen to expand their roles and these advances have wide support from the trade unions.*

Prof Chamberlain discussed the role with the regulator for Paramedics [now the HPC] and it was agreed that the development was simply an expansion of the paramedic role, reflecting changes in-patient need and demand. Subsequently, at the request of the DH and with the funding from the DH] the QAA led a process resulting in the competencies associated with the role being incorporated into:

a) The *Quality Assurance Agency Benchmark Statement* [the development of which was led by the QAA at the behest of the DH and with HPC involvement]. The regulator, the HPC and the Professional Body, the British Paramedic Association, BPA, supported this piece of work, which is fully compatible with the relevant EU ‘System Directives,’ that apply to Paramedics. This QAA document subsequently passed through full consultation that was led and co-ordinated by the QAA and was approved.

b) The BPA [later renamed as the College of Paramedics, CoP] then produced a *curriculum framework* to mirror the *NHS career framework* (Appendix 1) and the QAA Benchmark Statement, incorporating the competencies associated with the role, as is normal practice and with support from the HPC. At this stage and again in keeping with the NHS career framework the role was termed 'Paramedic Practitioner.' The term ECP was often used interchangeably, while the NHS career framework stated 'Senior Practitioner/Paramedic,' the Agenda for Change Pay spine uses similar language.

c) The Department of Health went further in endorsing this approach in their document 'Allied Health Professions with a Specialist Interest,' AHPSI, which contained a complementary exposition as to the benefits of 'Community Paramedics,' [Paramedic Practitioners]. The relevant document can be viewed on the DH web site at:

http://www.dh.gov.uk/PublicationsAndStatistics/Publications/PublicationsPolicyAndGuidance/PublicationsPolicyAndGuidanceArticle/fs/en?CONTENT_ID=4061610&chk=2vRv28

d) In August 2003 the DH [Rosie Winterton] launched the 'Ten Key Roles for AHP's.' In order to 'formally clarify what AHP's can do and what they should aim toward in the future.' The Ten Key roles initiative confirmed that all AHP's 'should be able to act as the first point of contact for patient care'. In addition to acting as a first contact provider the allocated duties included diagnosis, the ordering of diagnostic tests prescribing, discharge and referral, teaching and health promotion.

http://www.trentskills.nhs.uk/ts/pdf/hopkins.pdf

However, in a parallel development the now defunct MA adopted the PEC concept and renamed it the 'Emergency Care Practitioner' (ECP). Inexplicably a contradictory and inconsistent decision appears to have been made resulting in the role being promote as a ‘new generic healthcare worker, which clearly it was not.

Funding has now largely ceased and the ECP consultation exercise has not been universally well received with objections being lodged by JRCALC, HEADG, the BPA, and others including the ambulance employers, who have made individual and collective representation, the latter via the ASA. In these circumstances the most charitable view of the ECP initiative would seem to indicate that it is an unnecessary, costly, confusing and wasteful duplication of effort to the initially proposed concept of a Paramedic Practitioner.

The ECP is very much yesterday’s concept and the Paramedic Practitioner concept does offer a number of key advantages, which can be summarised as.

(i) Paramedic Practitioners/Senior Paramedics, SP/PP’s are directly linked or ‘tethered’ to a lead General Practitioner, from whom advice and support is immediately available

(ii) Training takes less time and has a strong vocational element

(iii) The model was developed locally between a senior General Practitioner and local ambulance staff

(iv) The model is approximately 1/3 cheaper than the ECP, which it has replaced

(v) Students are prepared within the context of the local health economy and develop key relationship with a range of clinicians while under training & remain in the ‘orbit’ of their local GP once qualified, retaining strong links between the Ambulance Service and Primary Care

(vi) The model retains a multi-disciplinary element, with shared teaching and learning of models that can be accessed by nurses seeking Nurse Practitioner status and also tutorial based and other teaching that involves medical students, nurse and paramedic practitioner students

(vii) Initial analysis shows that as a direct result of this strong local partnership Paramedics are able to redirect patients into Primary Care

(viii) Future modelling indicates that there are opportunities to align these patient flows with PBR thereby safely encouraging the flows of patients in a manner encouraged by 'Taking Health Care To the Patient' and national policy

(ix) The model is inherently safe; the emphasis is upon joint working and close collaboration with local medical and nursing staff. Autonomy, while not rejected is considered less of a factor than access to clinical advice, support and mentoring from General Practitioners

(x) An example would be the Paramedic Practitioner training and assessment processes for the use of NHS derived, evidence based, agreed Patient Group Directions for the assessment and administration of treatment, especially drug medication, for agreed common presenting problems. This addresses the tension between for prolonged and high level independent prescriber accreditation and the effective work of the Paramedic Practitioner and can be implemented in the programme.

(xi) The model is consistent with previously agreed [through DH consultation] roles and responsibilities for Paramedics

(xii) The Paramedic Practitioner, is also a development that fits will with the 'out of hours' agenda and there are already examples being developed that produce a partnership between PP's and out of hours doctors that build on the in hours model

(xiii) The approach draws upon experiences gained in Nurse Practitioner, Community Paramedic, military medic and pilot ECP experiences, taking the best from each of these

(xiv) The models is consistent with the DH Paramedic career framework and has the support of the British Paramedic Association, BPA, the Professional Body for Paramedics

(xv) Given the consistency with the career framework Paramedic Practitioners, as 'Senior Paramedics' also have a clinical supervision and mentoring role for new staff, thereby contributing to patient safety

(xvi) The arrangements reflect both the Quality Assurance Agency Benchmark Statements for Paramedics and the Paramedic Curriculum Framework document and EU System Directives

(xvii) Unlike the ECP there are no negative implications for Paramedic registration, or for 'duel' or 'distributed' registration, it is a much simpler arrangement with less implications for increased registration, bureaucratic and administrative costs

(xviii) The model is one that has positive implications for the morale of paramedics, in direct contrast to the ECP, which can easily be perceived as divisive and inconstant with previously agreed approaches

(xix) The model has strong local clinician, commissioner, union and staff support

(xx) The DH recommendations for Allied Health Professions, the '10 key roles' are fully considered and integrated into the training of Paramedic Practitioners

(xxi) Issues relating to pay of PP's are clear and contained within Agenda for Change pay band 6, while many ECP schemes are slipping into band 7 imposing greater cost on Trusts and commissioners

The core concepts of the PP are well integrated into a clear educational pathway that is fit for purpose. The programme has been designed by a strong multidisciplinary educational partnership consisting of senior General Practitioners from established teaching practices who participate in both classroom and practice based teaching, by ambulance clinicians, Nurses and by Higher Education Institute based academics.

The theoretical core content of the new Nature of Physical Assessment, Clinical Decision Making and Therapeutics/Pharmacology modules constitute stage 1 and provide the practitioner who successfully completes them with the foundation to progress to stage 2.

Stage 2 represents an exciting new development in the approach to ambulance clinician education. Candidates commence an apprenticeship-learning programme during which time pass through GP teaching practice, Unscheduled Care Centre/Walk in centre and operational “rotations.” Rotations are designed to consolidate and build upon academic learning through experiential learning guided by a close relationship with an assigned GP. Candidates will continue to expand their knowledge and skill base through structured day release so as to complete additional modules minor injury and illness as well as electives which ordinarily would include paediatrics, psychiatry and care of the elderly all of which would also be consolidated through rotations.

Final qualification occurs when the Paramedic Practitioner has successfully completed all theoretical modules and they are “signed off” by their GP mentor. Sign off only takes place once the GP mentor is satisfied that the candidate meets all the competencies developed by the GP led educational design team.

This has required an assessment of competence of the Paramedic Practitioner that is fit for purpose and addresses the requirements of all stakeholders. The assessment structure and processes is part of a jointly developed curriculum and involves being

assessed in a Higher Education Institute, in General Practice and other urgent Primary Care environments where workplace based assessment can easily be conducted. The methodology has been drawn from principles used for undergraduate medical student; foundation year doctors and GP Registrars and similar models exist in advanced nursing practice.

For example for GP Registrars: www.rcgp.org.uk/docs/nMRCGP_WPBAv12.ppt
For assessment principles:
www.pmetb.org.uk/fileadmin/user/QA/Assessment/Assessment_system_guidance_0107.pdf

The programme produces practitioners who can not only provide an emergency response but can also meet the primary care needs of patients through appropriate assessment, treatment or by seamlessly facilitating the patient's care pathway thus becoming a truly valuable addition to a multidisciplinary primary care team. These arrangements will ensure that the Ambulance Service will, through a close partnership with local Primary Care Physicians, become more effective at meeting the realities of present day demands, while also ensuring that it remains able to respond to more traditional cases of serious illness and injury.

In terms of recommendations to resolve the current Paramedic Practitioner/ECP anomalies four key points are offered with the intention of helping to resolve the current situation

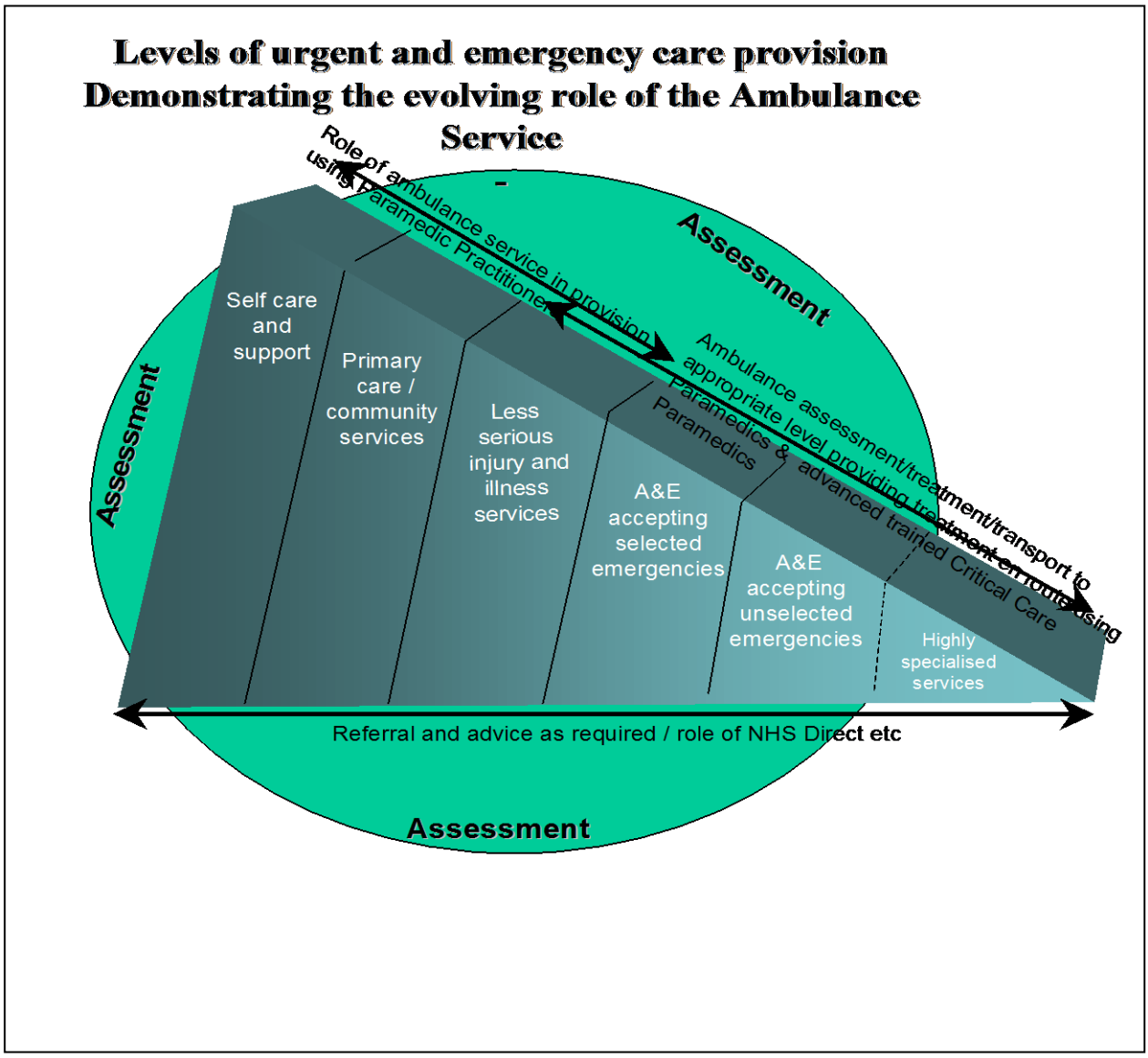
1. There are two many initiatives trying to occupy the same 'air space,' Paramedic Practitioners, Emergency Care Practitioners and Medical Care Practitioners, MCP's, [Physician Assistants] and Nurse Practitioners, NP's, this represents a wasteful duplication. The ECP is a role seemly created out of desperation to claim a 'new idea,' which it never was. There needs to be a rationalisation or clear division determining which practitioner is more

appropriate for a given set of circumstances. The PP would seem to fit the needs of the Ambulance Service; the NP is well established, MCP's appears more institutional based, either in an acute hospital or Primary Care setting. The ECP seems to aspire to a role everywhere, but is likely to be less tuned to any specific role. This over provision of practitioners should cease.

The ECP curriculum has been heavily criticised by many respondents. The Paramedic Practitioner curriculum is broadly similar, but more realistic and recognises the need for rapid access to on line medical advice and support to ensure practitioner support and patient safety.

2. The proposal for of separate registration for ECP has been ill conceived and unnecessary, it may also be unachievable and seems unlikely to pass the test of originality and lack of conflict with existing professions that is required by any aspirant group. The idea has no merit and should be dropped.

3. If common sense were to prevail an alternative to separate registration might be an annotation or endorsement to an individuals primary registration in the same way that happen routinely for the professions of Medicine and Nursing, who have specialist registers and lists of approved qualifications respectively. Utilising this approach Paramedics operating in the PP role would have an endorsement placed on their HPC registration in that same way that already exists for supplementary prescribing for other AHP's. Advanced Nurse Practitioners working with the Ambulance Service might enjoy similar recognition suitably attached to their NMC registration. Such an approach would represent an inexpensive, relatively simple and uncontroversial arrangement.



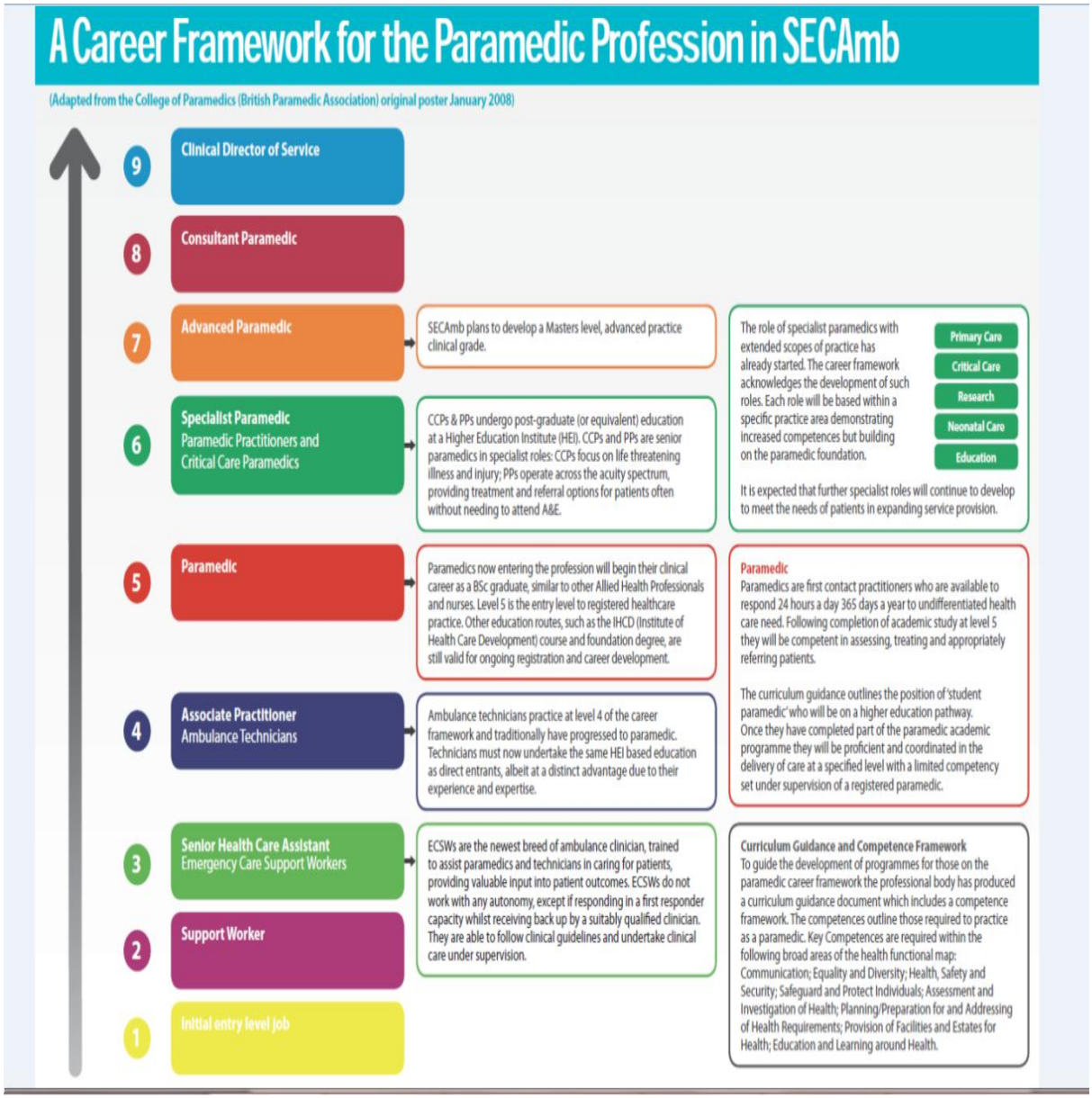
To conclude, the Paramedic Practitioner is best seen not as a new role but rather as an extension of an existing one. Put simply a paramedic who, like any other AHP and in common with the principles of the DH 'Ten key roles of AHP's,' has undertaken additional training and education (Appendix 2) to assess treat and if necessary refer patients with undifferentiated health problems so as to best meet the true needs of the majority of patients and achieve the laudable goal of providing a mobile health care resource. The implementation of the Paramedic Practitioner concept will also have the net effect of creating much improved levels of clinical leadership and clinical supervision

for other ambulance staff. Furthermore, all staff will have opportunity to climb a clinical career ladder, which will be based on the AHP career framework. This demonstrates a truly clinical career progression, which is far more in keeping with the modern NHS. It is a more appropriate model and will replace the current traditional approach whereby staff are often promoted without the necessary advanced clinical training and are thereby more restricted in their practice, credibility and general capability.

In final summary the Paramedic Practitioner programme links directly with local General Practitioners and other clinical staff who have a direct interest and ownership of the practical results of the initiative. The training and education of the student's takes place locally in practices where staff will work when trained and with whom long term relationships can be built. The course of training is designed to provide appropriate skills in patient assessment and minor illness and injury care and gives local medical practitioners the opportunity to teach students on a one to one basis and it groups with academic accreditation provided by an Institute of Higher Education. Staff who chose to join the programme can develop their practice within a local supported environment and progress through the Paramedic clinical career framework that promotes a gradual increasing level of clinical expertise and leadership to meet the demands of the patients of the modern NHS now and into the future. The approach works for patients, staff and the NHS, is evolutionary, not revolutionary, while also being both cost and clinically effective, it is in effect a simpler, faster, cheaper common sense orientated response to changing patient needs.

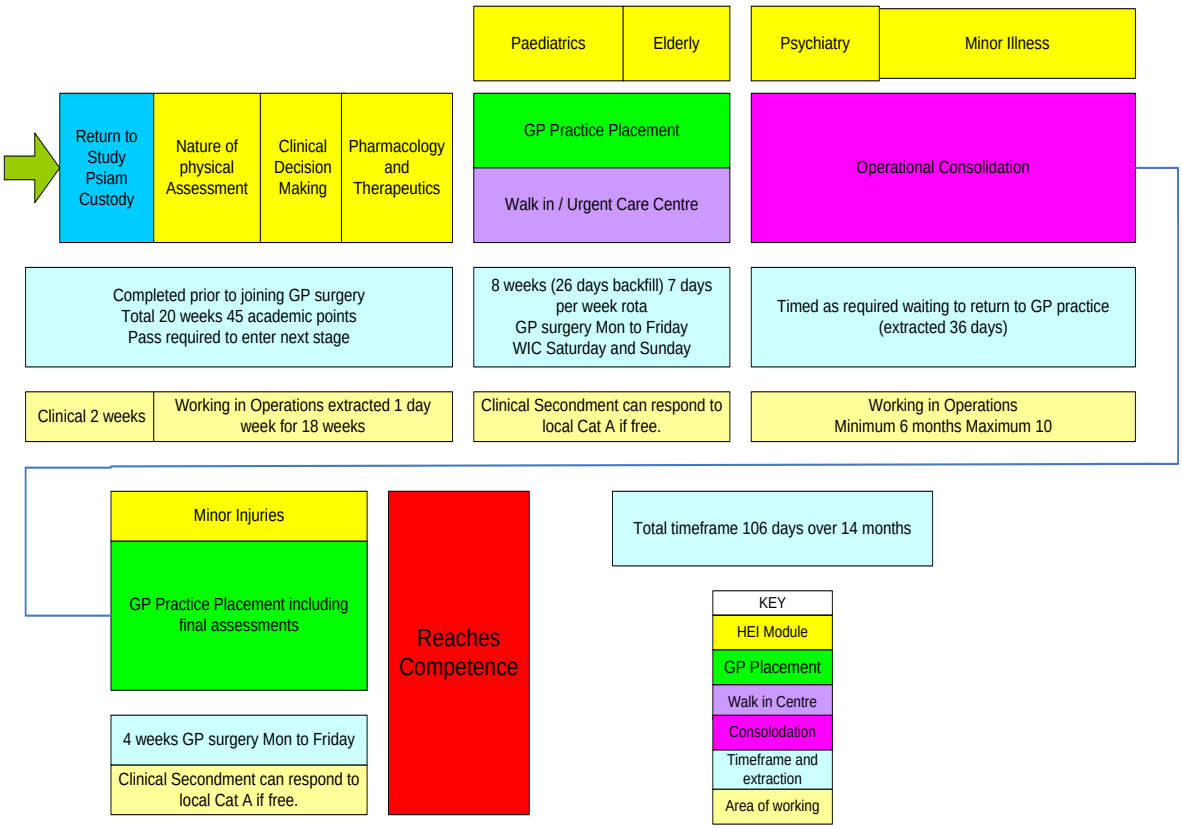
Andy Newton 2007

APPENDIX I


A Career Framework for the Paramedic Profession in SECAmb
(Adapted from the College of Paramedics (British Paramedic Association) original poster January 2008)
9
Clinical Director of Service
8
Consultant Paramedic
7
Advanced Paramedic
SECAmb plans to develop a Masters level, advanced practice clinical grade.
The role of specialist paramedics with extended scopes of practice has already started. The career framework acknowledges the development of such roles. Each role will be based within a specific practice area demonstrating increased competences but building on the paramedic foundation.
Primary Care
Critical Care
Research
Neonatal Care
Education
It is expected that further specialist roles will continue to develop to meet the needs of patients in expanding service provision.
6
Specialist Paramedic
Paramedic Practitioners and Critical Care Paramedics
CCPs & PPs undergo post-graduate (or equivalent) education at a Higher Education Institute (HEI). CCPs and PPs are senior paramedics in specialist roles: CCPs focus on life threatening illness and injury; PPs operate across the acuity spectrum, providing treatment and referral options for patients often without needing to attend A&E.
5
Paramedic
Paramedics now entering the profession will begin their clinical career as a BSc graduate, similar to other Allied Health Professionals and nurses. Level 5 is the entry level to registered healthcare practice. Other education routes, such as the IHCD (Institute of Health Care Development) course and foundation degree, are still valid for ongoing registration and career development.
Paramedic
Paramedics are first contact practitioners who are available to respond 24 hours a day 365 days a year to undifferentiated health care need. Following completion of academic study at level 5 they will be competent in assessing, treating and appropriately referring patients.
The curriculum guidance outlines the position of 'student paramedic' who will be on a higher education pathway. Once they have completed part of the paramedic academic programme they will be proficient and coordinated in the delivery of care at a specified level with a limited competency set under supervision of a registered paramedic.
4
Associate Practitioner
Ambulance Technicians
Ambulance technicians practice at level 4 of the career framework and traditionally have progressed to paramedic. Technicians must now undertake the same HEI based education as direct entrants, albeit at a distinct advantage due to their experience and expertise.
3
Senior Health Care Assistant
Emergency Care Support Workers
ECSWs are the newest breed of ambulance clinician, trained to assist paramedics and technicians in caring for patients, providing valuable input into patient outcomes. ECSWs do not work with any autonomy, except if responding in a first responder capacity whilst receiving back up by a suitably qualified clinician. They are able to follow clinical guidelines and undertake clinical care under supervision.
Curriculum Guidance and Competence Framework
To guide the development of programmes for those on the paramedic career framework the professional body has produced a curriculum guidance document which includes a competence framework. The competences outline those required to practice as a paramedic. Key Competences are required within the following broad areas of the health functional map: Communication; Equality and Diversity; Health, Safety and Security; Safeguard and Protect Individuals; Assessment and Investigation of Health; Planning/Preparation for and Addressing of Health Requirements; Provision of Facilities and Estates for Health; Education and Learning around Health.
2
Support Worker
1
Initial entry level job

APPENDIX II

PARAMEDIC PRACTITONER PROGRAMME



Appendix V

College of Paramedics and Ambulance Employer's letter

Mr Marc Seale,Chief Executive and
Dr. Anna Van der Gaag, Chair
Health Professions Council
Park House
184 Kennington Park Road
London
SE11 4BU

13th March, 2012

Dear Marc and Anna,

We are writing with regard to the current HPC Standards of Education and Training (SET 1.1) as this applies to the paramedic profession, which we believe represents a key element in the continued professionalisation of paramedics, as registered healthcare providers.

The College of Paramedics (the College) has long recommended that the current level descriptor: 'Equivalent to Certificate of Higher Education for paramedics' be adjusted in order to reflect the recommendations of various key stakeholders, for example:

- QAA Benchmark Statement: Paramedic Science (2004)
- Taking Healthcare to the Patient part 1 (DH, 2005)

- Curriculum Guidance and Competency Framework 2nd Ed. (College of Paramedics, 2008)
- Pre Registration Education and Funding for Paramedics (DH, 2008)
- Taking Healthcare to the Patient part 2 (DH, 2011)

Over recent years, the College has continued to engage with key stakeholders over threshold entry. This dialogue has included employers of paramedics (both public and private sector), the majority of which are NHS ambulance trusts.

We are pleased to inform you that these discussions have recently resulted in a unified view between the national ambulance services 'Directors of Human Resources' group and the College, in that both now believe the time is right to review SET 1.1.

The principle reasons for this can be summarised as follows:

Expanding Paramedic Scope of Practice

The pattern of demand on emergency ambulance services has changed radically in the last 15 years, with many ambulance services reviewing their models of operation in favour of non-transportation and hospital avoidance. Paramedics are now routinely expected to manage a huge range of acute and chronic patients autonomously, treating and/or referring as appropriate.

Given the above transition, it comes as no surprise to us that paramedics represent a 'high risk' group in terms of numbers appearing before FtP hearings. We believe this is due in part to changing practice, but also because of the inadequacies of the traditional training approach, elements of which were highlighted by the HPC validation of IHCD courses and by recent research on professionalisation .

Looking forward, we do not believe that future developments in clinical care can be achieved on the foundation of the current threshold entry level and that consequently ambulance strategic objectives may be compromised. We are also concerned that as paramedic practice continues to evolve, patient safety may suffer because of a lack of the necessary underpinning knowledge to manage complex care needs.

Feedback from our own membership and from those who are currently educating tomorrow's paramedics suggests that as well as an imminent move to level 5, a three year programme is desirable in order to deliver the necessary range of learning outcomes. Because of this the College's Education Committee believes that programmes should move to a three-year (full-time) duration as soon as is practicable but at least by 2016. This being the case many programmes may choose to deliver a level 6 award on completion and several are already in the process of doing so.

Equity

According to the DH definition below, paramedics are recognised as allied health professionals:

- First-contact practitioners
- Performing essential diagnostic and therapeutic roles
- Working across a wide range of locations and sectors across acute, primary and community care
- Performing assessment, diagnosis, treatment and discharge throughout the care pathway

Despite this, paramedics are the only profession registered by the HPC with such a low level of threshold entry. We are aware of the HPC's position in so much that it is not concerned with the level of the qualification awarded but places emphasis on the criteria set out in the SETs and SoPs. We would be able to accept this if it were not for the fact that the current situation has resulted in a perverse incentive for some training providers to design and offer courses at the minimal standard which almost mirrors the previous vocational pathway and provides a perpetual alternative entry route, in effect a 'two-tier' system. This situation inhibits professionalisation and the clinical capability of ambulance services and sustains confusion about commissioning of education. We are now seeing new validation requests from private providers at level 4 and we believe that as long as this is proffered as the exemplar according to SET 1.1, long term quality will suffer.

There is evidence that despite a small number of providers at level 4, the majority of UK paramedics now graduate from higher education (HE) programmes at levels 5 or 6 despite SET1.1. This has been the trend for some years and is confirmed by recent College and Centre for Workforce Intelligence (CfWI) findings. In recent years, various support for HE programmes at level 5 has been granted via direct and indirect funding from government, often according to their own guidance . However such support is now in jeopardy, due in part to the lack of standardisation of provider programmes across the country.

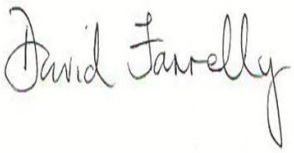
A clear signal from the regulator at this stage would align the paramedic profession with other AHPs and provide a more robust model for equitable support, such as NHS Bursary provision.

In Summary, the College of Paramedics and the NHS Ambulance Services are united in the view that as a first step in ensuring that entry-level paramedics remain fit for purpose against rising expectations, SET 1.1 should be adjusted to a minimum of academic level 5 from 2013 onwards.

We would respectfully request a meeting to discuss this position at your earliest convenience.

Regards

Prof. Andy Newton
Chair
College of Paramedics



Mr David Farrelly
Chair
National Ambulance HR Directors Group

Appendix VI

IHCD Modules D, E, F, G, H and I Learning Outcomes

ITEM	MODULE
A	Anatomy and Physiology
B	Clinical patient assessment including physical examination skills
C	Assessment of patients' primary and social care needs
D	Ethics, Law and Professional Practice issues
E	Management of critical medical emergencies including cardiac resuscitation
F	Management of critical trauma emergencies
G	Pharmacology, over-dosage of drugs, and poisoning
H	Management of psychiatric disorders
I	Management of obstetric emergencies
J	Management of Paediatric emergencies
K	Recognition of child abuse
L	Management of elderly patients
M	Management of major incidents
N	Management of hazardous materials
O	Management of aggression and violence
P	Use of technology
Q	Management Health and Safety

R	Manual handling, etc
S	Understanding Evidence Based Practice
T	Information, research and study skills
U	Teamwork skills

1. Percentage of respondents indicating "Very satisfactory", "Satisfactory" or "Mostly satisfactory"

Section		Sub-Section		Reference
D:1	INTRODUCTION TO THE BODY	D1:1		
D:2	LIFTING, HANDLING AND EQUIPMENT	D2:1	General principles	
		D2:2	Carry Chair	
		D2:3	Lifting Aids	
		D2:4	Patient positioning	
		D2:5	Multi-posture cot	
		D2:6	Rescue stretchers	
		D2:7	Light rescue	
D:3	RESPIRATORY SYSTEM	D3:1		
		D3:2	Chest injuries	
		D3:3	Chest diseases and salbutamol	
		D3:4	Drowning	
		D3:5	Respiratory Arrest	
D:4	CIRCULATORY SYSTEM	D4:1		
		D4:2	Cardiac conditions	
		D4:3	Cardiac monitoring	
		D4:4	Shock	
		D4:5	Blood pressure measurement	

		D4:6	Faints	
D:5	CARDIAC MONITORING	D5:1	Defibrillation and monitoring	
D:6	AIRWAY MANAGEMENT AND RESUSCITATION	D6:1	Airway management and CPR	
		D6:2	Oro-pharyngeal airways & resuscitation equipment	
		D6:3	Entonox and oxygen	
		D6:4	Suction equipment	
D:7	EXAMINATION AND ASSESSMENT	D7:1	Conscious patients	
		D7:2	Unconscious patients	
D:8	ASSISTING THE PARAMEDIC	D8:1	Fluid administration	
		D8:2	Drug administration	
		D8:3	Airway management/intubation	
D:9	INFANTS AND CHILDREN	D9:1	Infants and Children	
E:1	NERVOUS SYSTEM	E1:1		
E:2	NERVOUS DISORDERS	E2:1	Epilepsy	
		E2:2	Cerebrovascular accidents	
E:3	SKELETAL SYSTEM	E3:1		
E:4	MUSCULOSKELETAL TRAUMA	E4:1	Injuries to bones, joints, tendons and ligaments	
		E4:2	Injuries to pelvis and spine	
		E4:3	Immobilisation and support	
		E4:4	Head injuries	
		E4:5	Maxillo Facial injuries	
		E4:6	Removal of crash helmet	
E:5	WOUNDS AND BLEEDING	E5:1	Wounds and bleeding	

		E5:2	Burns and scalds	
		E5:3	Eye injuries	
		E5:4	Management of trauma	
E:6	INFECTIOUS DISEASES	E6:1	General	
		E6:2	Universal Precautions	
		E6:3	Category 3 diseases	
		E6:4	Aids and HIV	
E:7	INFANTS AND CHILDREN	E7:1	Child abuse	
F:1	DIGESTIVE SYSTEM	F1:1		
F:2	DIABETES & GLUCAGON	F2:1	Diabetes and glucagon	
F:3	LAW & AMBULANCE STAFF	F3:1	Law and ambulance staff	
		F3:2	Suspected death and management of bodies	
		F3:3	Violent patients	
		F3:4	Mental illness	
F:4	MAJOR INCIDENTS	F4:1	Major incidents	
		F4:2	Hazardous substances	
		F4:3	Civil disturbances	
F:5	POISONING	F5:1	Poisoning	
		F5:2	Solvent abuse	
F:6	EXTREMES OF BODY TEMPERATURE	F6:1	Extremes of temperature	
F:7	MATERNITY	F7:1	Maternity	
		F7:2	Premature babies and incubators	
F:8	HAEMODIALYSIS	F8:1	Haemodialysis	
F:9	ACUTE ABDOMINAL PROBLEMS	F9:1	Acute abdominal problems	
F:10	INFANTS & CHILDREN	F10:1	Infant and children	

IHCD AMBULANCE PERSONNEL AWARDS

PARAMEDIC SYLLABUS

REVISED PARAMEDIC SYLLABUS – UNIT AND ELEMENT STRUCTURE

G1	**THE RESPIRATORY SYSTEM**
G1.1	Structure of the respiratory system
G1.2	Mechanism of the respiratory system
G1.3	Normal/abnormal conditions of the respiratory system
G1.4	Treatment/management of conditions of the respiratory system
G2	**THE CARDIOVASCULAR SYSTEM**
G2.1	Structure of the cardiovascular system
G2.2	Mechanism of the cardiovascular system
G2.3	Shock
G2.4	Normal/abnormal conditions of the cardiovascular system
G2.5	Treatment/management of conditions of the cardiovascular system
G3	**THE NERVOUS SYSTEM / OBSERVATION AND ASSESSMENT**
G3.1	Structure of the nervous system
G3.2	Observation and assessment
G3.3	Treatment and management of disorders of the nervous system
H1	**TRAUMA CARE**
H1.1	Mechanisms of trauma
H1.2	Assessment and examination of trauma
H1.3	Principles of trauma management
H1.4	Management of the trauma patient
	H1.4.1 Head trauma
	H1.4.2 Thoracic trauma

	H1.4.3 Abdominal / pelvic trauma H1.4.4 Spinal trauma H1.4.5 Extremities trauma H1.4.6 Trauma in pregnancy
H2	**THERMAL INJURIES**
H2.1	Recognition and management of thermal injuries
H3	**MEDICAL CONDITIONS**
H3.1	Diabetes mellitus
H3.2	Drug overdoses/poisoning
H3.3	Convulsions/fits
I1	**PAEDIATRIC CARE**
I1.1	Anatomical and physiological differences between adults and children
I1.2	Paediatric assessment & examination and recognition of the seriously ill or deteriorating child
I1.3	Management of the sick child (and parents)
I1.4	Paediatric trauma and thermal injuries
I1.5	Management of cardiac arrest in neonates, infants and children
I1.6	Resuscitation of the baby at birth (common with I2.7)
I2	**OBSTETRICS AND GYNAECOLOGY**
I2.1	General and local organisation of domicilliary, obstetric and gynaecology services
I2.2	Anatomical, physiological and pathological changes during pregnancy
I2.3	Assessment and examination of the pregnant woman
I2.4	Normal labour
I2.5	Abnormalities in pregnancy and labour
I2.6	Resuscitation in pregnancy
I2.7	Resuscitation of the baby at birth (common with I1.6)
ADDENDUM – Additional skills and related underpinning knowledge	

ADDENDUM

The following skills and related knowledge and use of equipment are considered additional to the core Paramedic syllabus, but Services may wish to adopt them subject to the support of their Paramedic Steering Committee (or equivalent). Where these skills are adopted, Services will be responsible for ensuring the adequacy of both the teaching and assessment of the skills in question.

Element	**Optional Additional**
G1.3	Use of laryngeal mask
G1.4	• Perform crycothyroidotomy • Use of laryngeal mask
G2.5	• Intra-osseus infusion • External jugular vein cannulation
H1.4	Crycothyroidotomy
H2.1	Crycothyroidotomy
H3.1	Use of glucometers
I1.2	Child thermometer
I1.3	• Intraosseous access • Laryngeal mask
I1.4	• Crycothyroidotomy • Needle thoracocentesis • Intraosseous cannulation and infusion
I1.5	• Intraosseous cannulation and infusion • Crycothyroidotomy • Needle thoracocentesis
I1.6	• Endotracheal intubation • Intraosseous cannulation and infusion • Drug administration via an indwelling tracheal tube or umbilical vein
I2.7	• endotracheal intubation • intraosseous cannulation and infusion

Appendix VII

Results

Recognition of child abuse ATT Training Module

Table 31: Technician Curriculum & Recognition of Child Abuse

		Technician or paramedic		Total
		Technician	Paramedic	
Tech curriculum & recognition of child abuse	Very satisfactory	25	7	32
	Satisfactory	54	38	92
	Mostly satisfactory	118	93	211
	Mostly unsatisfactory	109	96	205
	Unsatisfactory	56	79	135
	Very unsatisfactory	19	35	54
Total		381	348	729

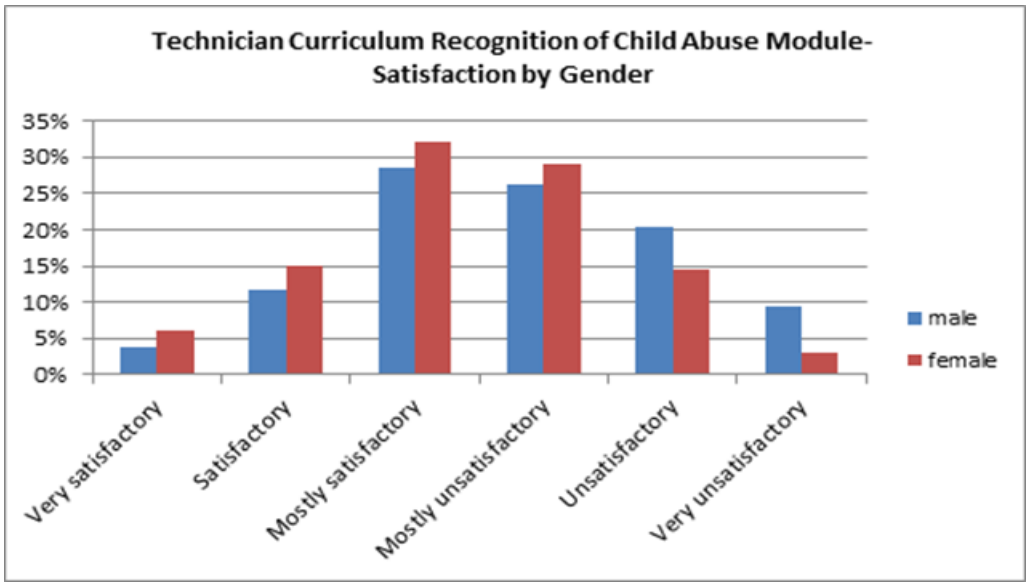


Figure 117: Technician Curriculum & Recognition of Child Abuse by Gender

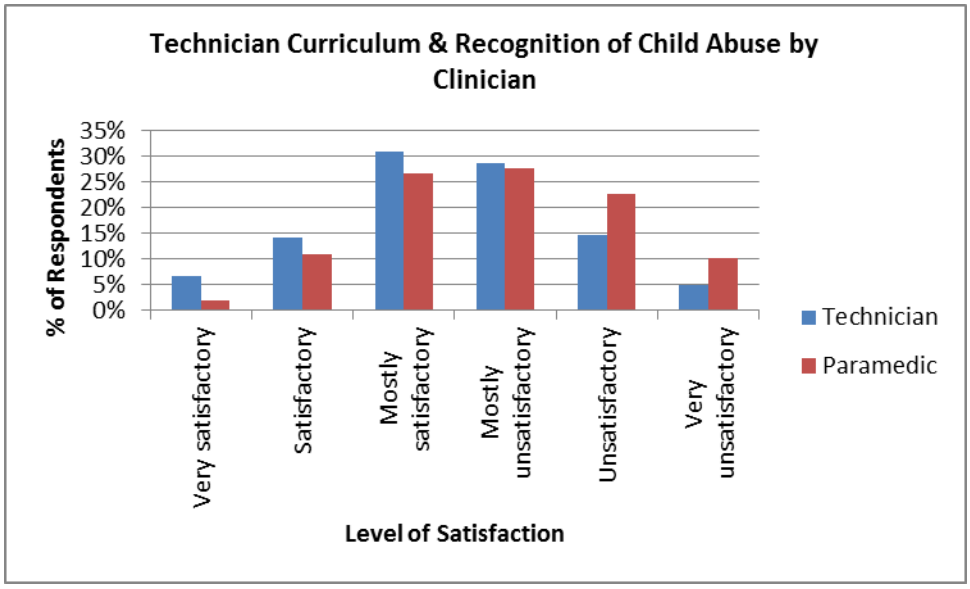


Figure 118: Technician Curriculum & Recognition of Child Abuse by Technicians and Paramedics.

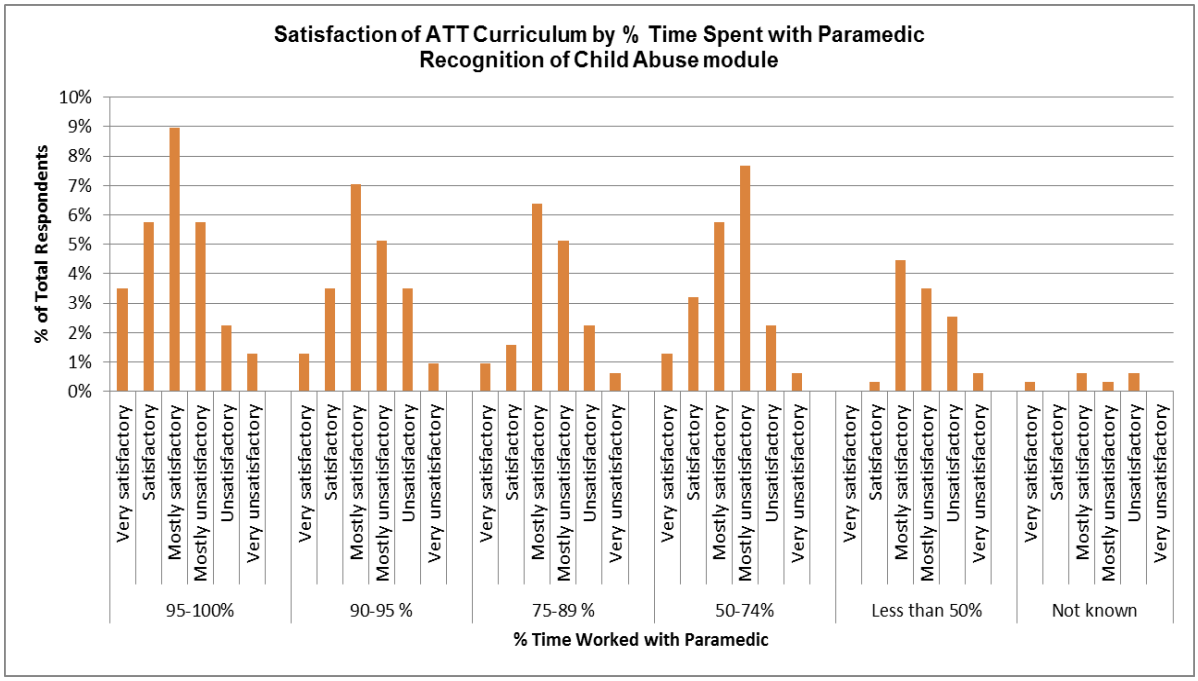


Figure 119: Technician curriculum recognition of child abuse by time spent with paramedic.

Hazardous materials ATT Training Module

Table 32: Technician Curriculum & Hazardous Materials

		Technician or paramedic		Total
		Technician	Paramedic	
Tech curriculum & hazardous materials	Very satisfactory	14	7	21
	Satisfactory	72	34	106
	Mostly satisfactory	111	112	223
	Mostly unsatisfactory	100	98	198
	Unsatisfactory	60	67	127
	Very unsatisfactory	26	31	57
Total		383	349	732

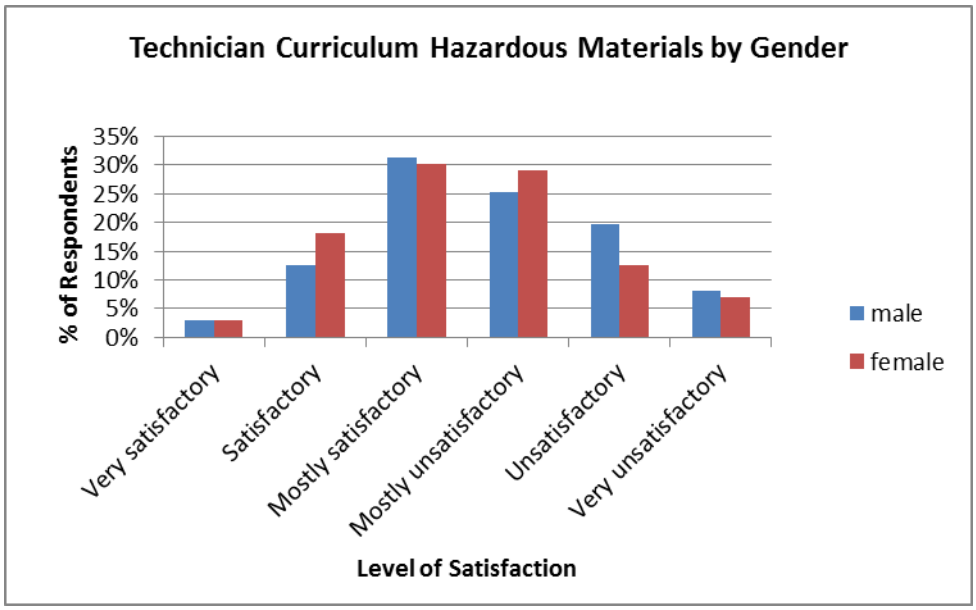


Figure 120: Technician Curriculum & Hazardous Materials by Gender.

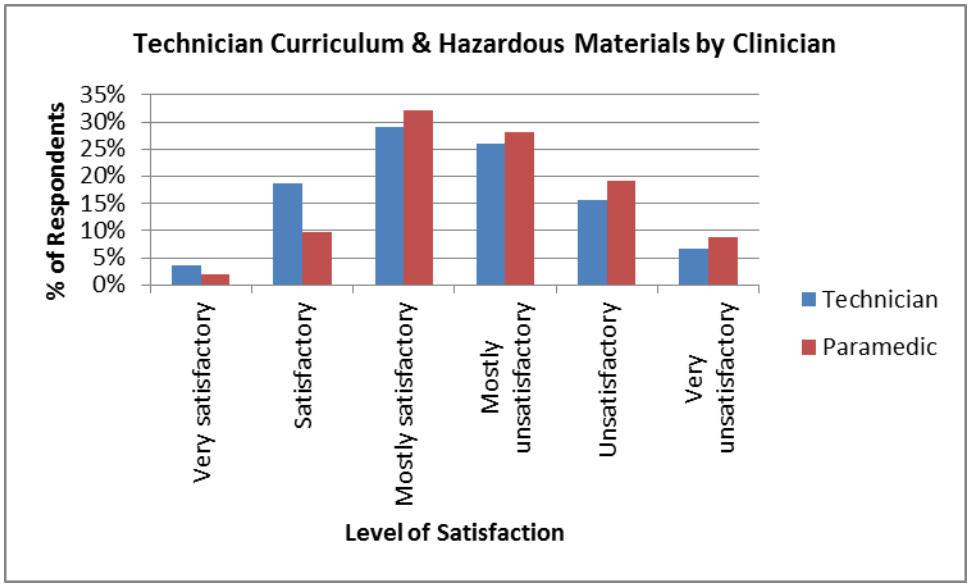


Figure 121: Technician Curriculum & Hazardous Materials by Technician and Paramedic.

Use of technology ATT Training Module

Table 33: Technician Curriculum & Use of Technology

		Technician or paramedic		Total
		Technician	Paramedic	Technician
Tech curriculum & use of technology	Very satisfactory	22	11	33
	Satisfactory	69	50	119
	Mostly satisfactory	119	112	231
	Mostly unsatisfactory	97	74	171
	Unsatisfactory	45	61	106
	Very unsatisfactory	30	41	71
Total		382	349	731

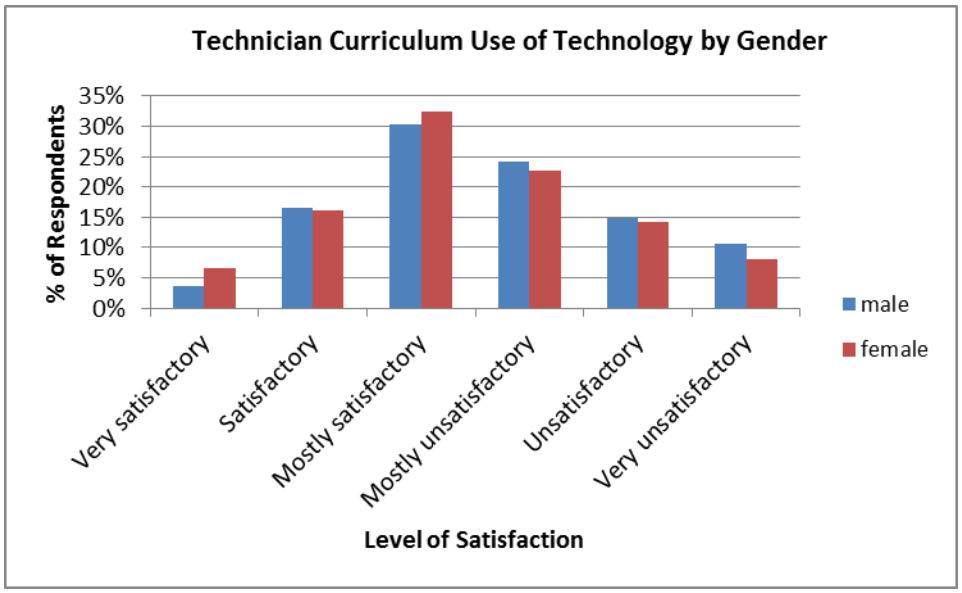


Figure 122: Technician Curriculum & Use of Technology by Gender

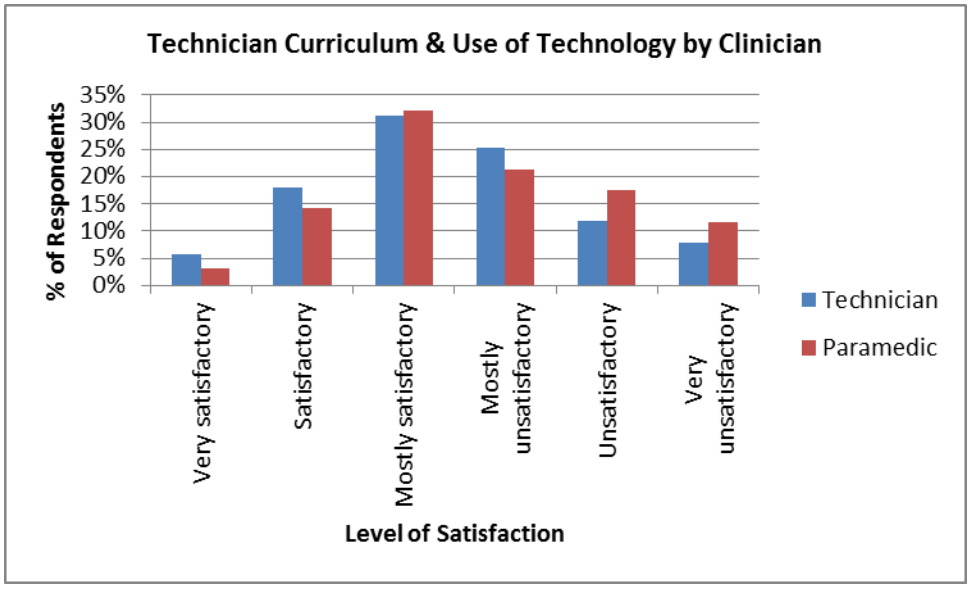


Figure 123: Technician Curriculum & Use of Technology by Technician and Paramedics.

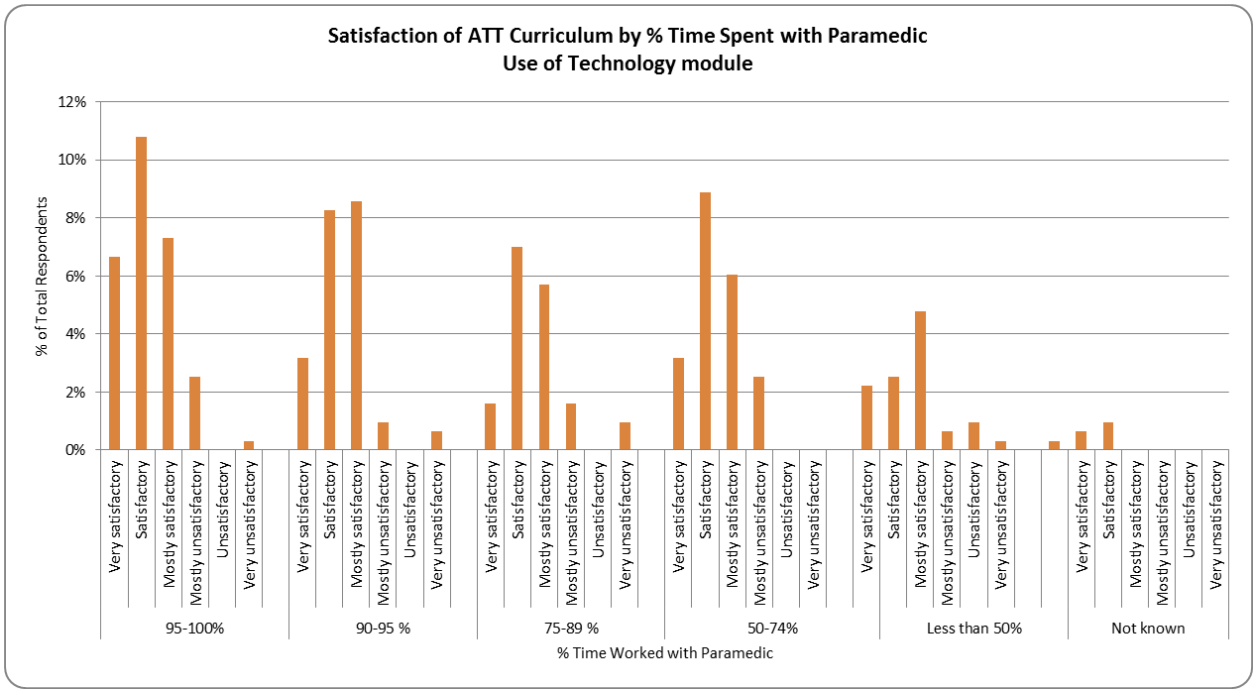


Figure 124: Technician curriculum use of technology by time spent with paramedic.

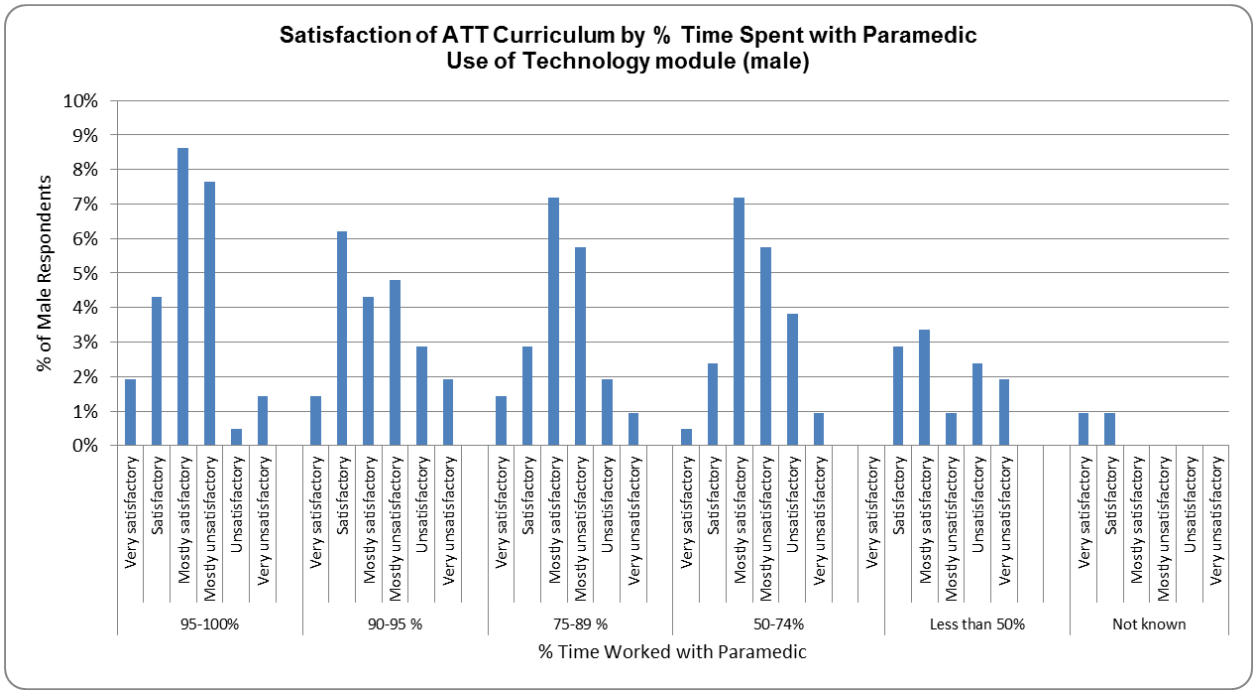


Figure 125: Technician curriculum use of technology by time spent with paramedic (male technicians).

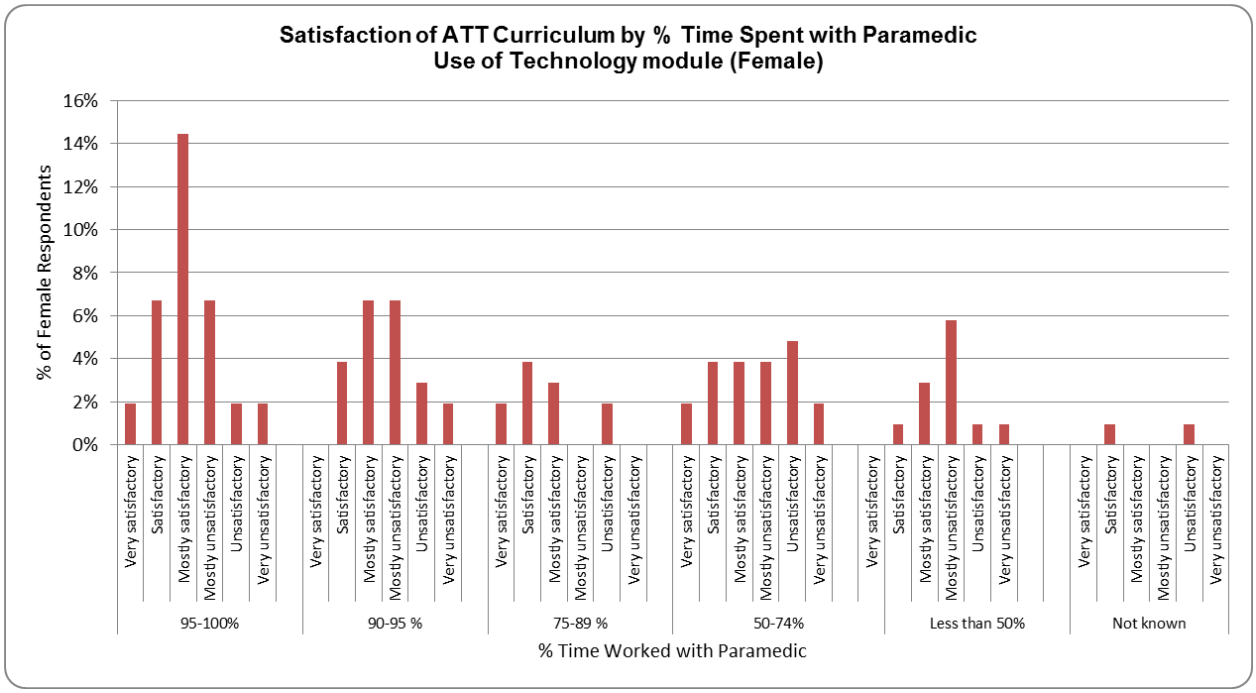


Figure 126: Technician curriculum use of technology by time spent with paramedic (female technicians).

Health & Safety ATT Training Module

Table 34: Technician curriculum & health and safety

		Technician or paramedic		Total
		Technician	Paramedic	
Tech curriculum &health & safety	Very satisfactory	30	10	40
	Satisfactory	89	61	150
	Mostly satisfactory	149	145	294
	Mostly unsatisfactory	73	75	148
	Unsatisfactory	28	43	71
	Very unsatisfactory	14	15	29
Total		383	349	732

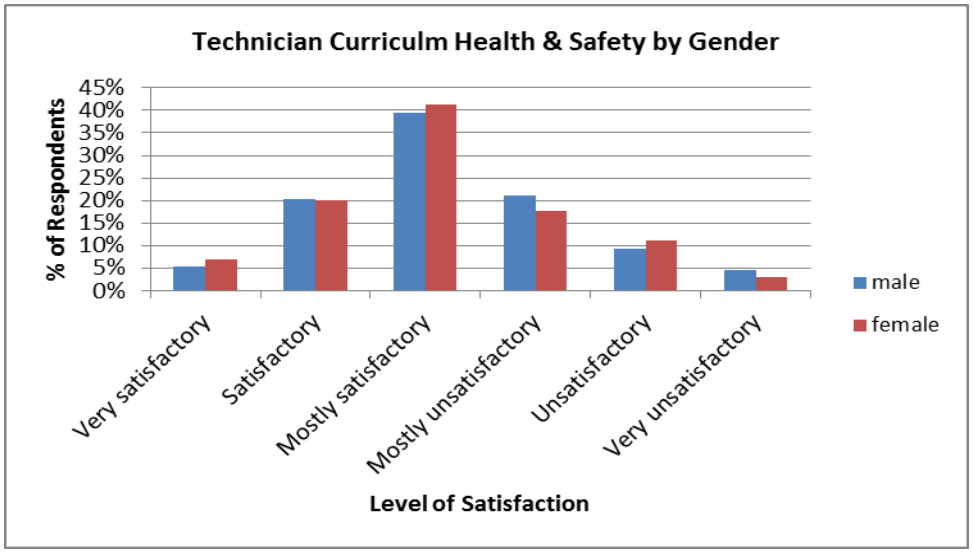


Figure 127: Technician curriculum & health and safety by gender

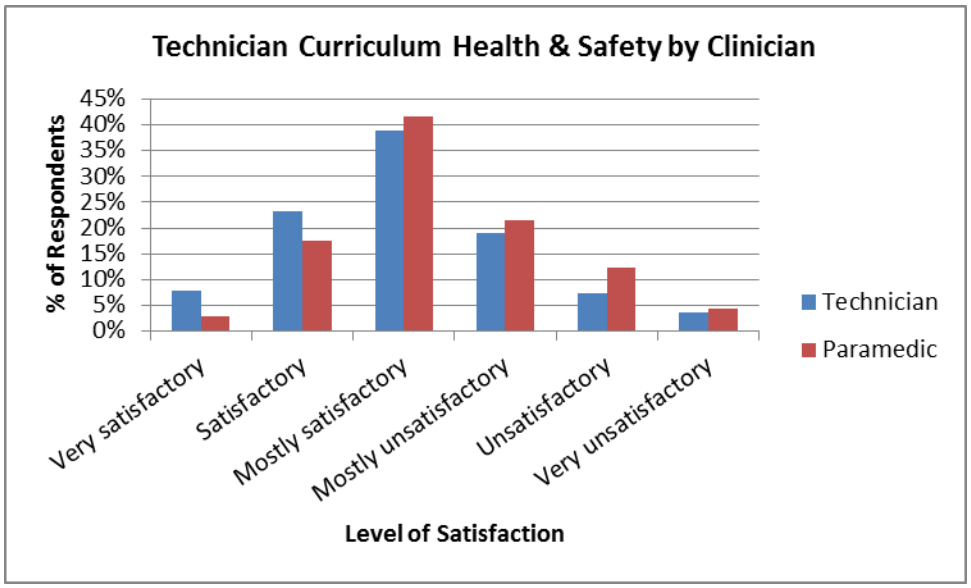


Figure 128: Technician curriculum & health and safety by skill set

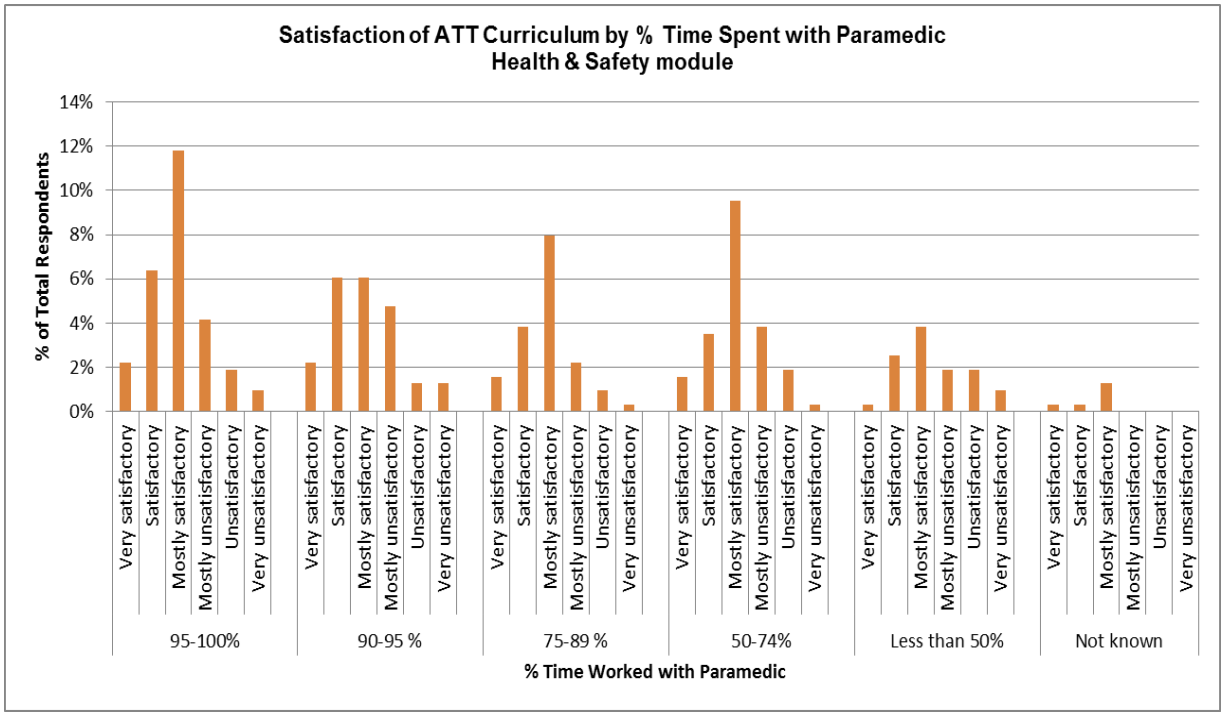


Figure 129: Technician curriculum health & safety by time spent with paramedic

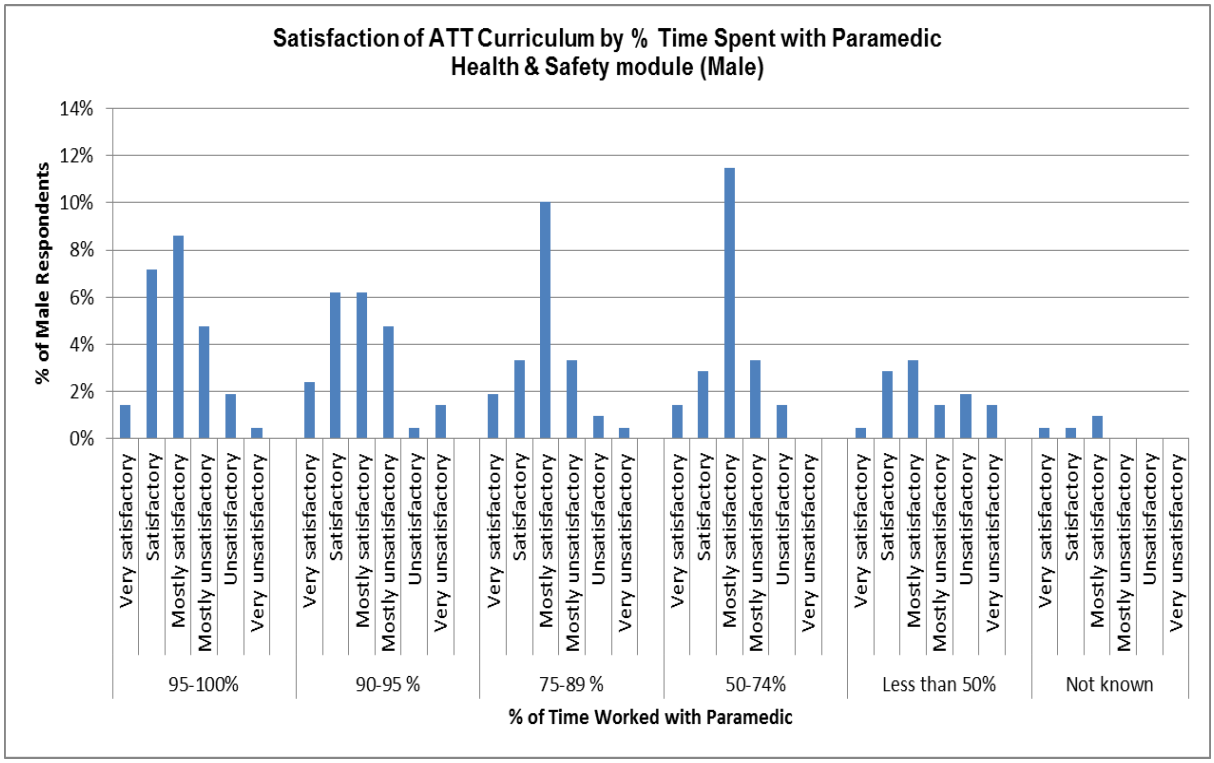


Figure 130: Technician curriculum health & safety by time spent with paramedic (male technicians)

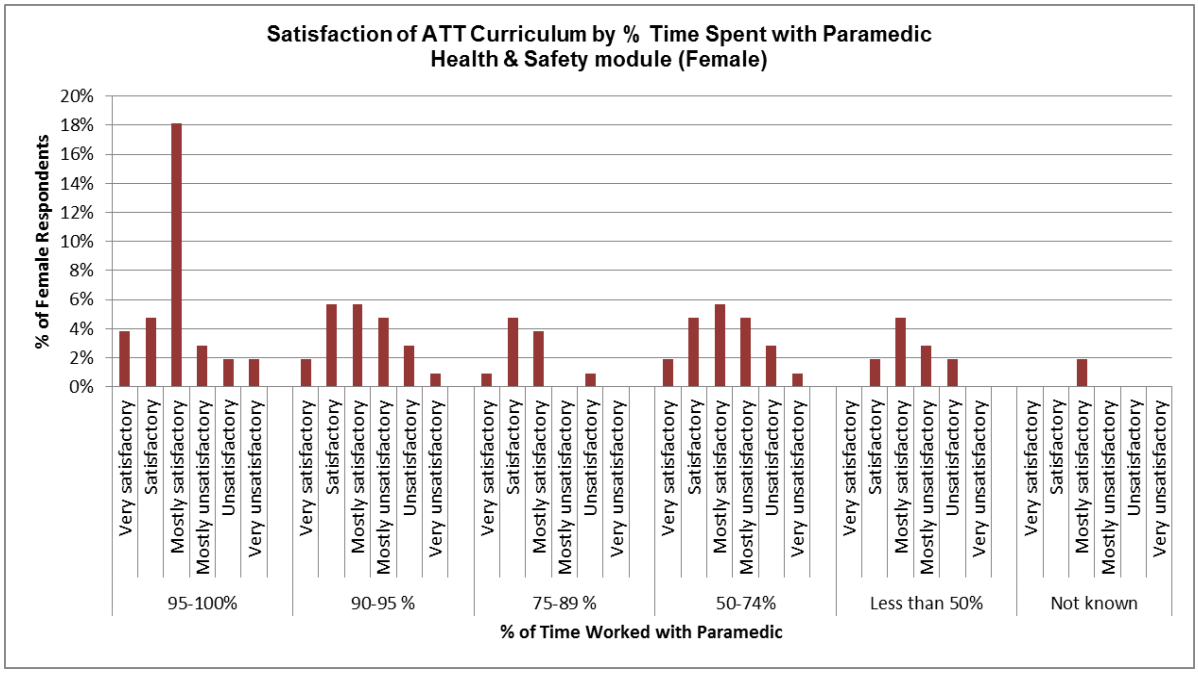


Figure 131: Technician curriculum health & safety by time spent with paramedic (female technicians)

Manual Handling ATT Training Module

Table 35: Technician Curriculum Manual Handling

		Technician or paramedic		Total
		Technician	Paramedic	
Tech curriculum & manual handling	Very satisfactory	71	33	104
	Satisfactory	144	114	258
	Mostly satisfactory	122	140	262
	Mostly unsatisfactory	33	29	62
	Unsatisfactory	9	17	26
	Very unsatisfactory	3	15	18
Total		382	348	730

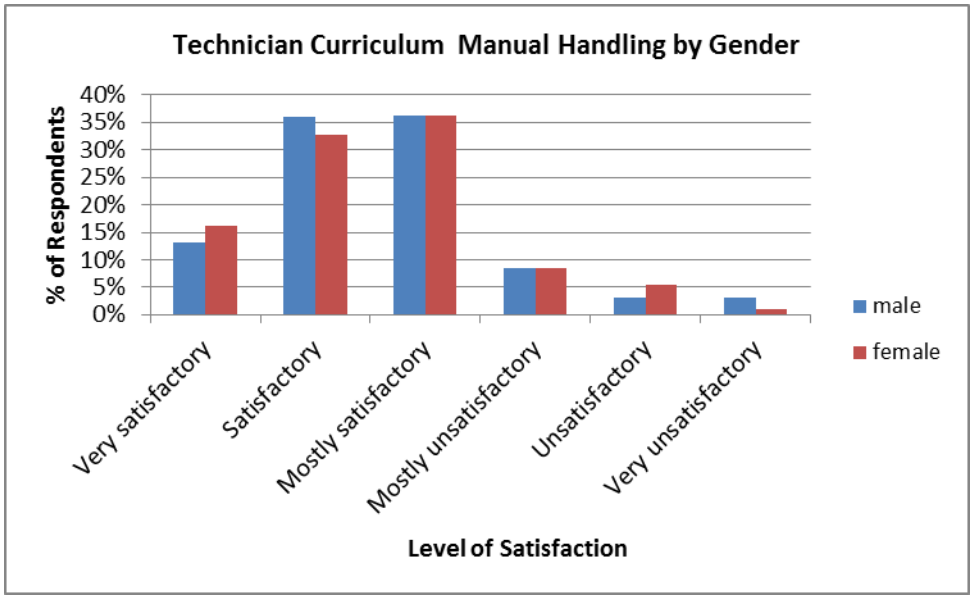


Figure 132: Technician Curriculum Manual Handling by Gender

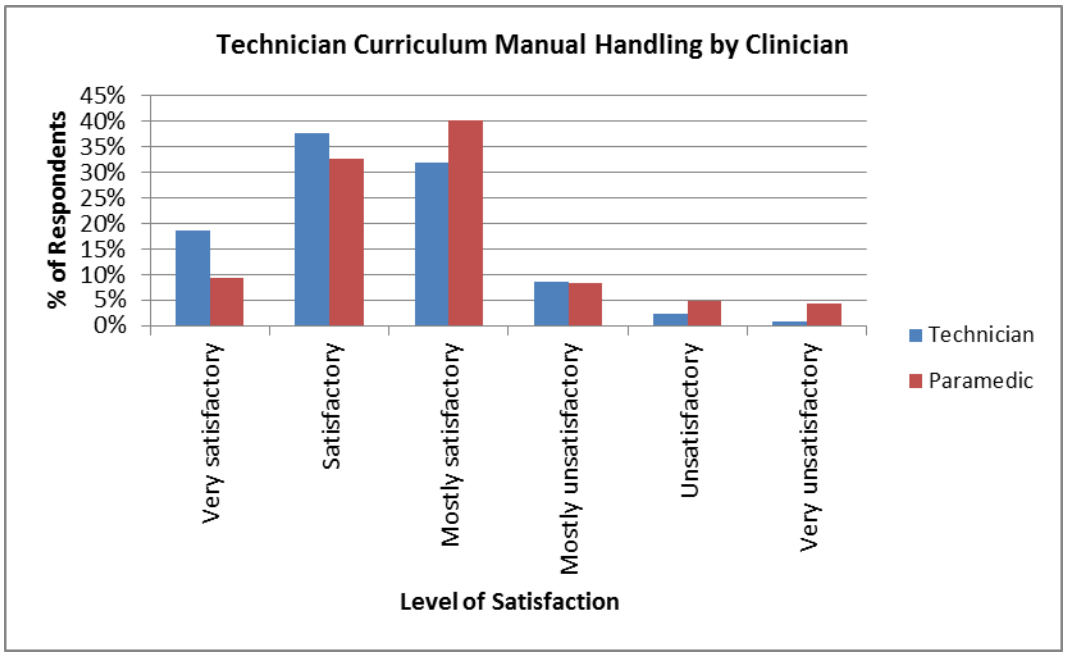


Figure 133: Technician Curriculum Manual Handling by Skill Set

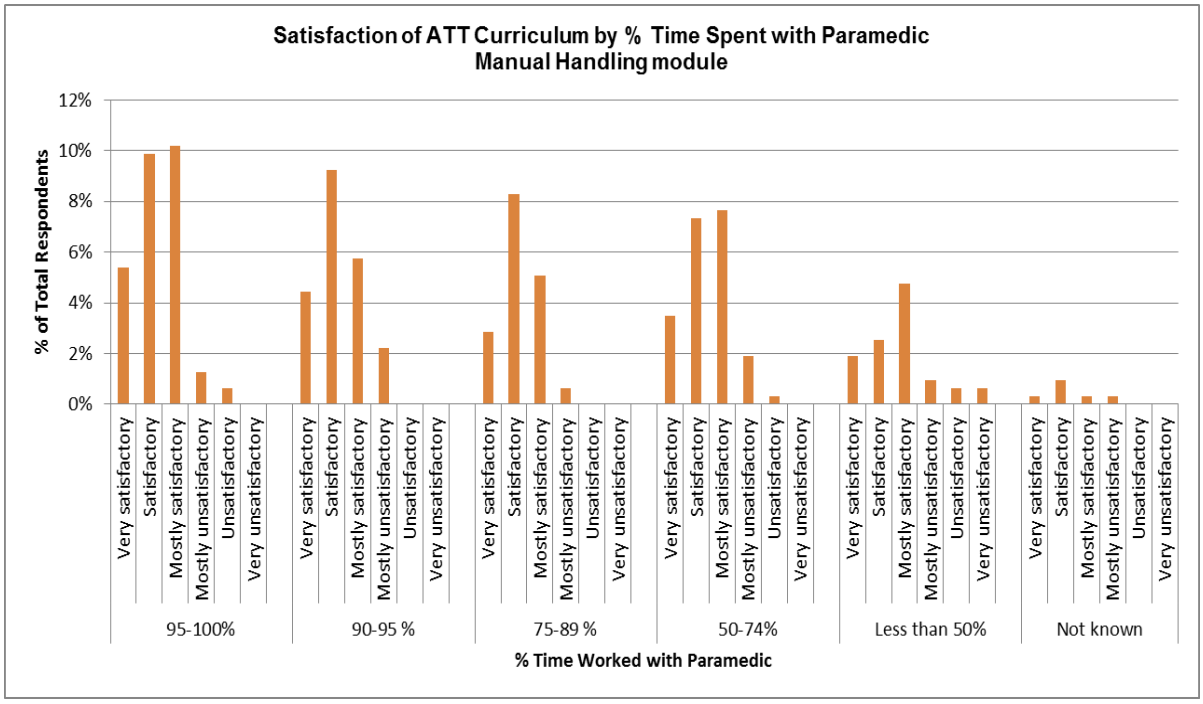


Figure 134: Technician curriculum manual handling by time spent with paramedic

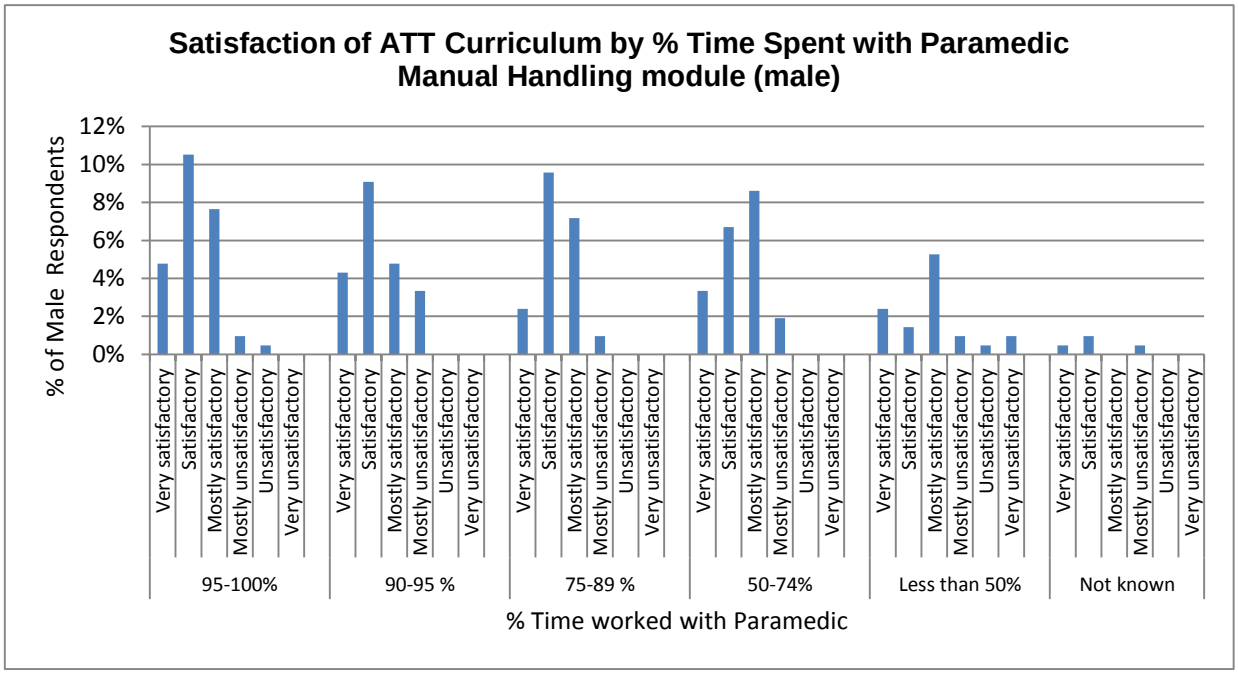


Figure 135: Technician curriculum manual handling by time spent with paramedic (male technicians)

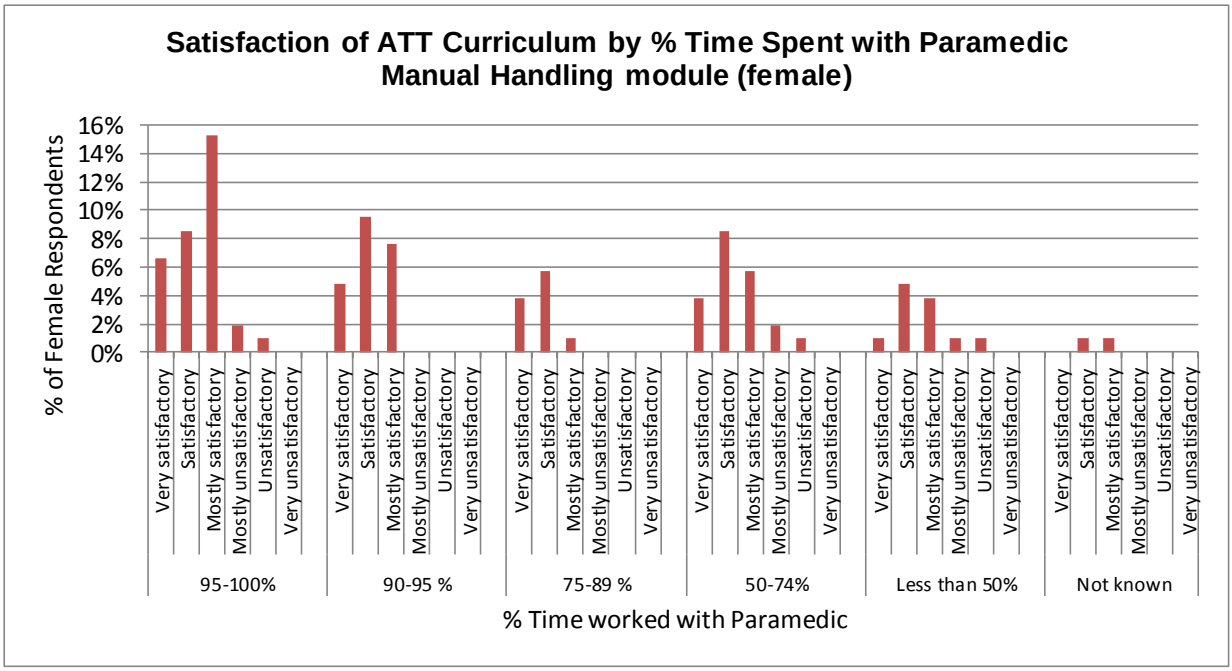


Figure 136: Technician curriculum manual handling by time spent with paramedic (female technicians)

Para curriculum & hazardous materials * Gender Cross-tabulation

Table 36: Paramedic Curriculum & Hazardous Materials

		Gender		Total
		Male	Female	Male
Para curriculum & hazardous materials	Very satisfactory	4	0	4
	Satisfactory	23	4	27
	Mostly satisfactory	71	19	90
	Mostly unsatisfactory	55	21	76
	Unsatisfactory	54	19	73
	Very unsatisfactory	22	4	26
Total		229	67	296

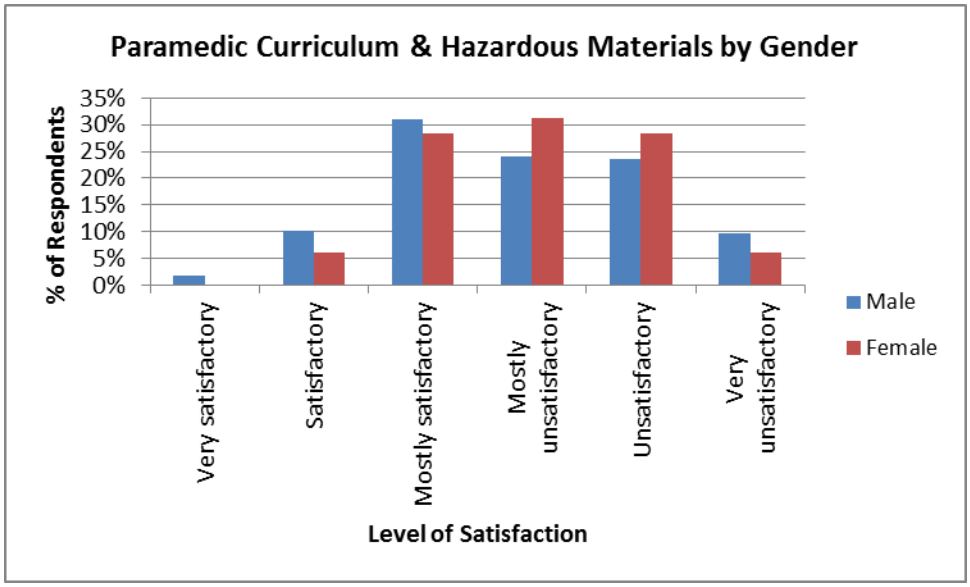


Figure 137: Paramedic Curriculum & Hazardous Materials

Para curriculum & management aggression & violence * Gender Cross-tabulation

Table 37: Paramedic Curriculum & Management Aggression & Violence

		Gender		Total
		Male	Female	Male
Para curriculum & management aggression & violence	Very satisfactory	3	2	5
	Satisfactory	27	7	34
	Mostly satisfactory	63	20	83
	Mostly unsatisfactory	58	16	74
	Unsatisfactory	48	14	62
	Very unsatisfactory	31	10	41
Total		230	69	299

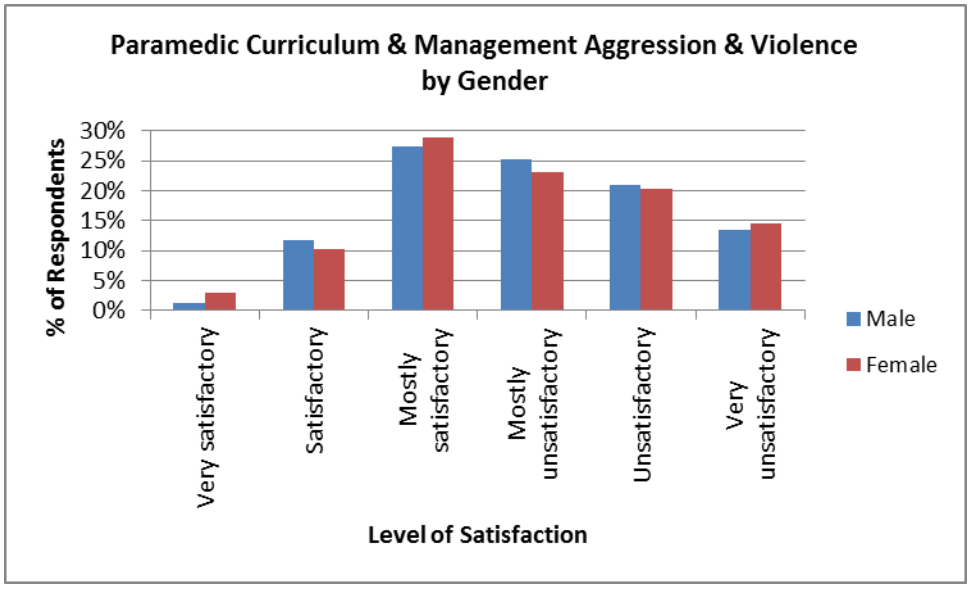


Figure 138: Paramedic Curriculum & Management Aggression & Violence

Para curriculum &use of technology * Gender Cross-tabulation

Table 38: Paramedic Curriculum & Use of Technology

		Gender		Total
		Male	Female	Male
Para curriculum & use of technology	Very satisfactory	8	2	10
	Satisfactory	41	9	50
	Mostly satisfactory	67	24	91
	Mostly unsatisfactory	41	15	56
	Unsatisfactory	43	14	57
	Very unsatisfactory	30	5	35
Total		230	69	299

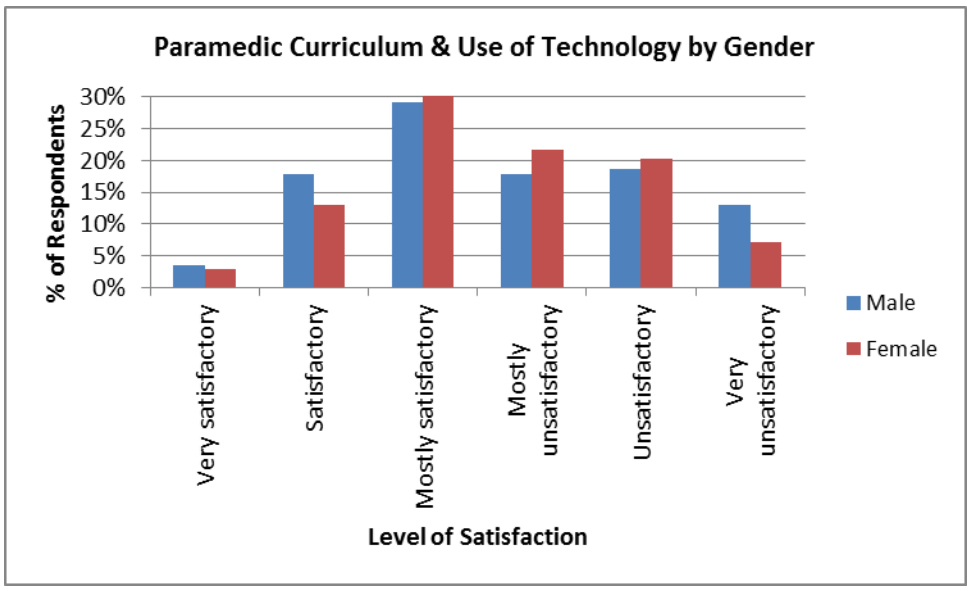


Figure 139: Paramedic Curriculum & Use of Technology

Para curriculum &health & safety * Gender Cross-tabulation

Table 39: Paramedic Curriculum and Health & Safety

		Gender		Total
		Male	Female	Male
Para curriculum & health & safety	Very satisfactory	2	3	5
	Satisfactory	52	6	58
	Mostly satisfactory	70	27	97
	Mostly unsatisfactory	54	19	73
	Unsatisfactory	35	12	47
	Very unsatisfactory	18	2	20
Total		231	69	300

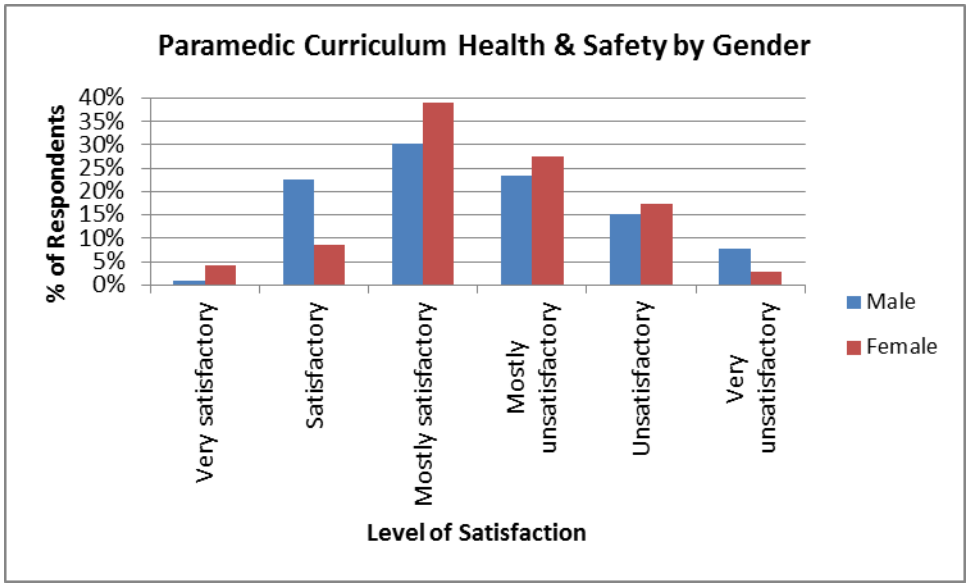


Figure 140: Paramedic Curriculum and Health & Safety

Para curriculum &manual handling * Gender Cross-tabulation

Table 40: Paramedic Curriculum and Manual Handling

		Gender		Total
		Male	Female	Male
Para curriculum & manual handling	Very satisfactory	19	7	26
	Satisfactory	76	13	89
	Mostly satisfactory	81	31	112
	Mostly unsatisfactory	23	7	30
	Unsatisfactory	23	9	32
	Very unsatisfactory	10	2	12
Total		232	69	301

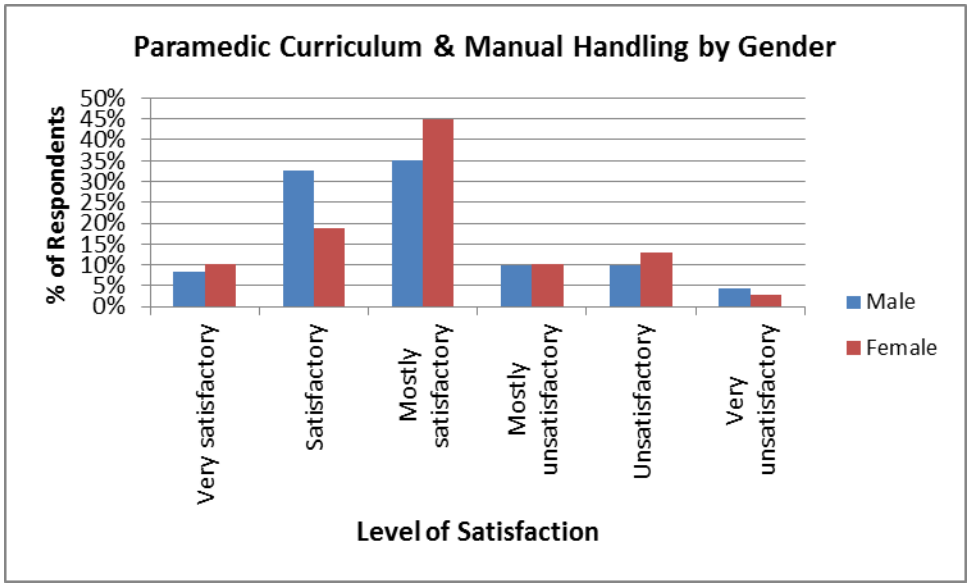


Figure 141: Paramedic Curriculum and Manual Handling

Para curriculum & evidence based practice * Gender Cross-tabulation

Table 41: Paramedic Curriculum and Evidence Based Practice

		Gender		Total
		Male	Female	Male
Para curriculum &evidence based practice	Very satisfactory	6	2	8
	Satisfactory	33	9	42
	Mostly satisfactory	62	25	87
	Mostly unsatisfactory	53	21	74
	Unsatisfactory	43	7	50
	Very unsatisfactory	35	5	40
Total		232	69	301

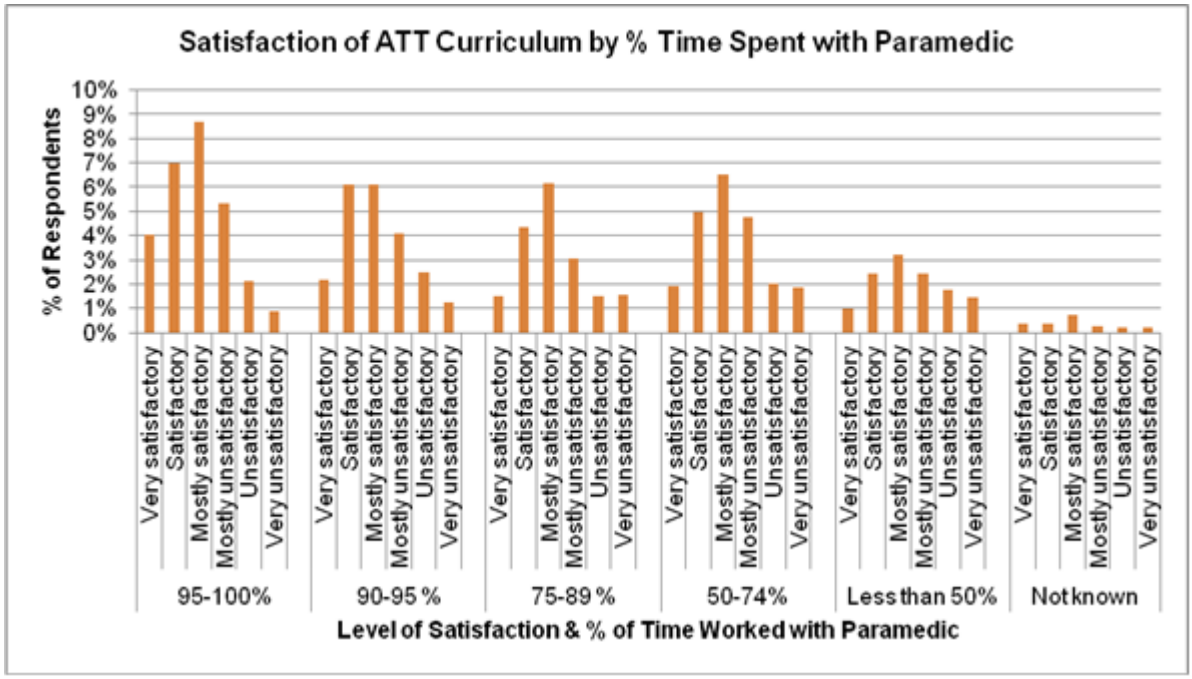


Figure 142: Satisfaction of ATT Curriculum by Time Spent with Paramedic

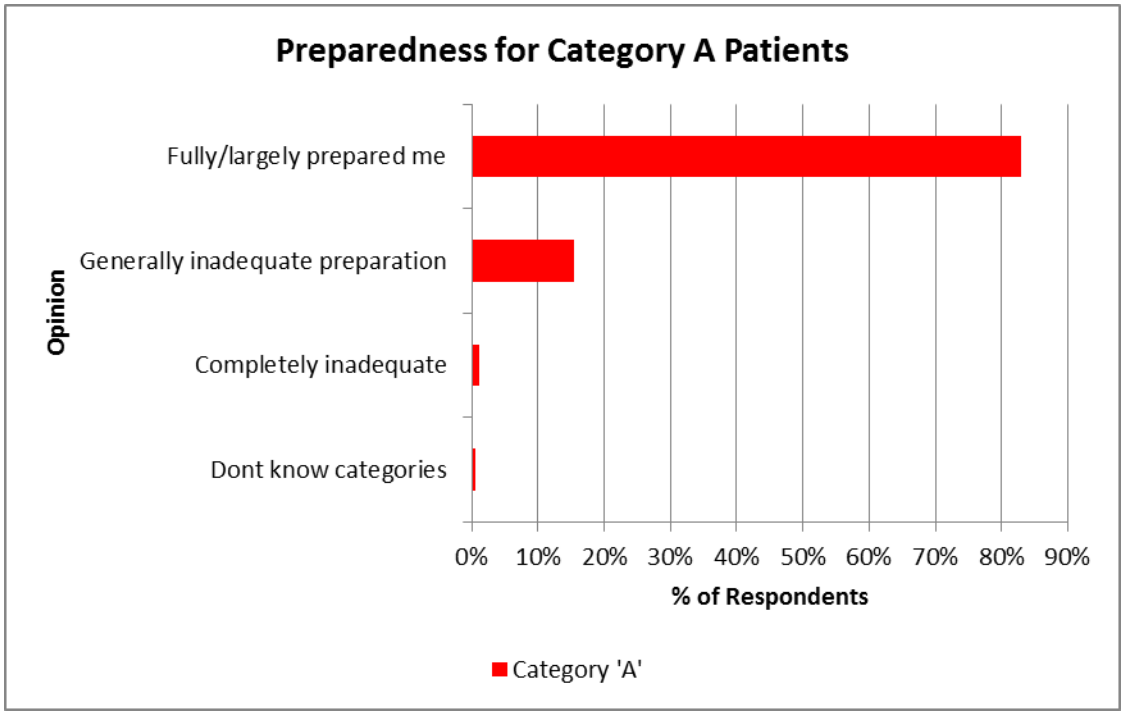


Figure 143: ATT Curriculum Preparation for Cat ‘A’ Patients

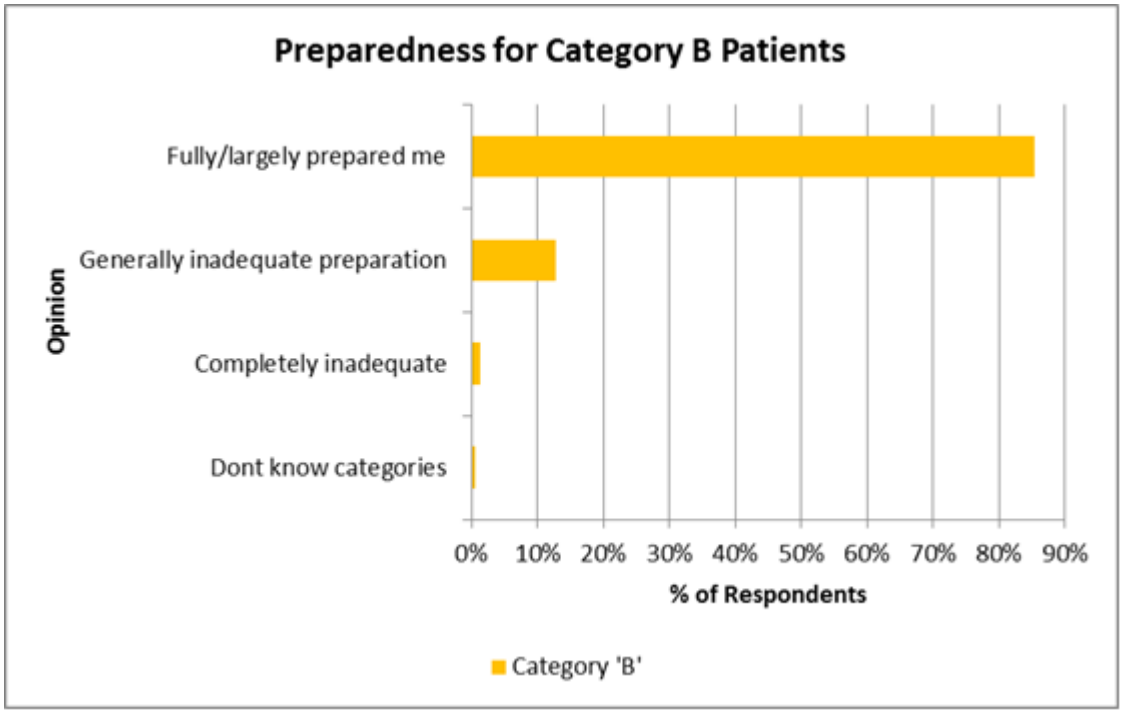


Figure 144: ATT Curriculum Preparation for Cat 'B' Patients

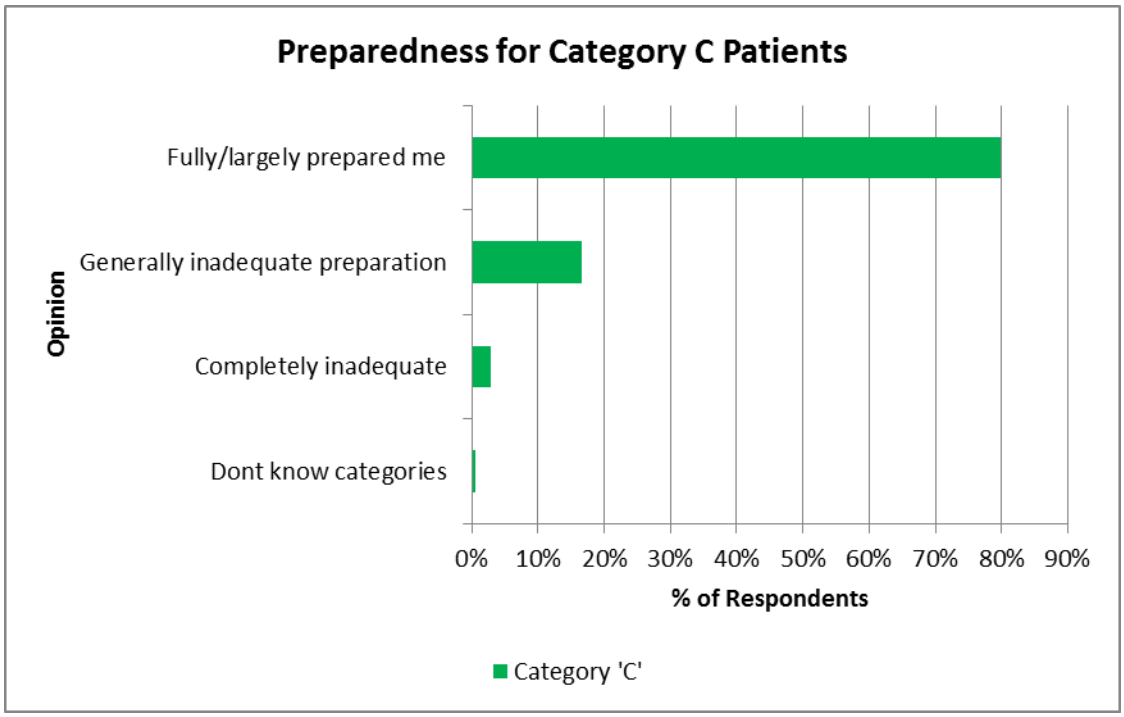


Figure 145: ATT Curriculum Preparation for Cat 'C' Patients

Elderly patients ATT Training Module

Table 42: Technician Curriculum & Elderly patients

		Technician or paramedic		Total
		Technician	Paramedic	Technician
Tech curriculum & elderly patients	Very satisfactory	39	8	47
	Satisfactory	105	69	174
	Mostly satisfactory	139	158	297
	Mostly unsatisfactory	68	62	130
	Unsatisfactory	24	45	69
	Very unsatisfactory	7	7	14
Total		382	349	731

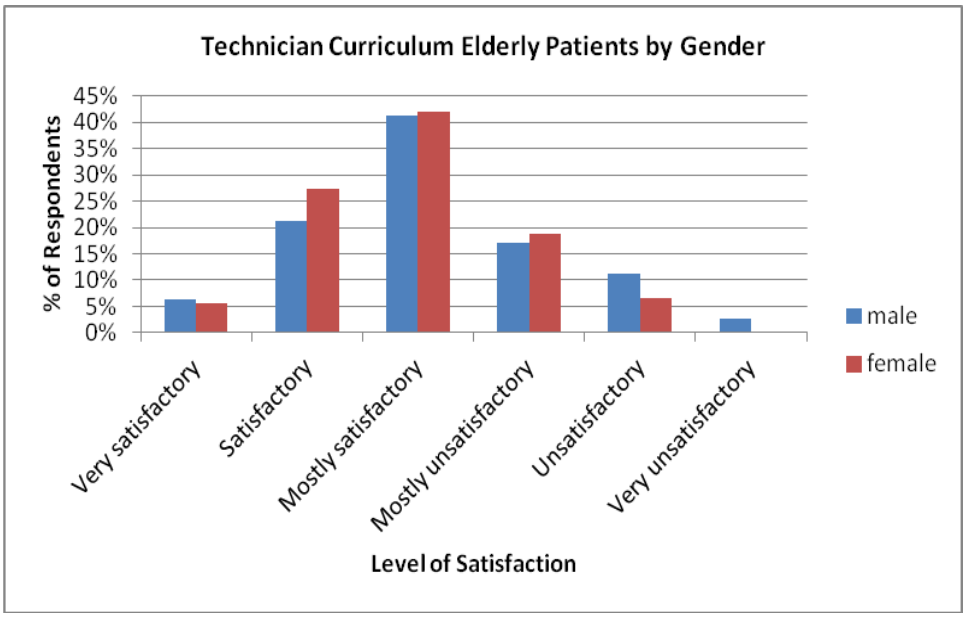


Figure 146: Technician Curriculum & elderly patients by Gender.

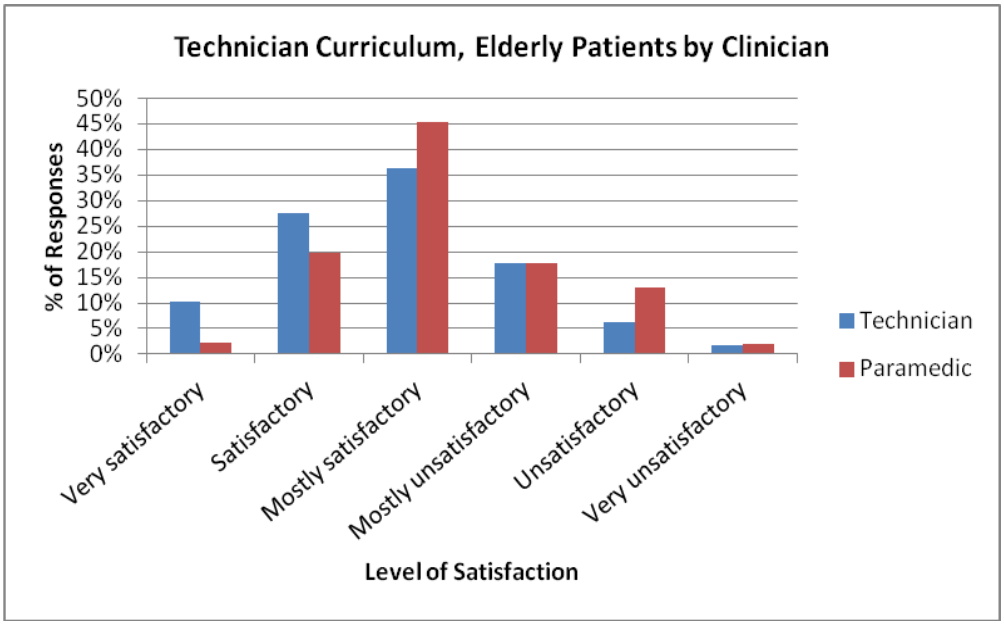


Figure 147: Technician Curriculum & elderly Technician and Paramedic.

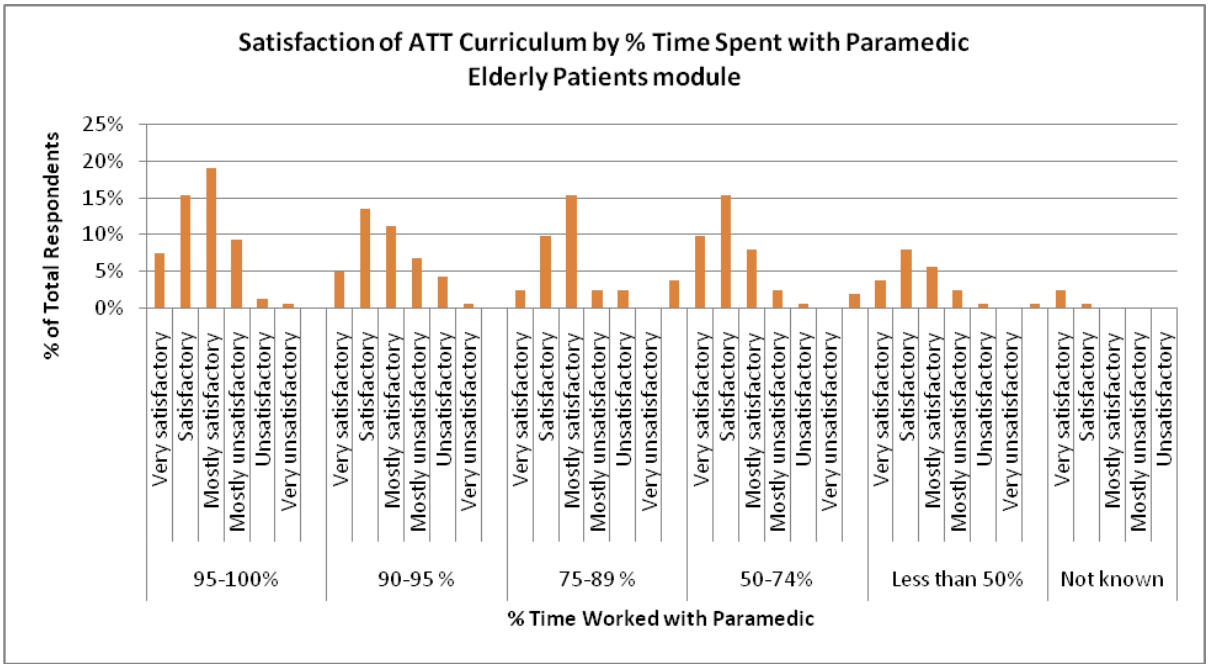


Figure 148: Technician curriculum elderly patients by time spent with paramedic.

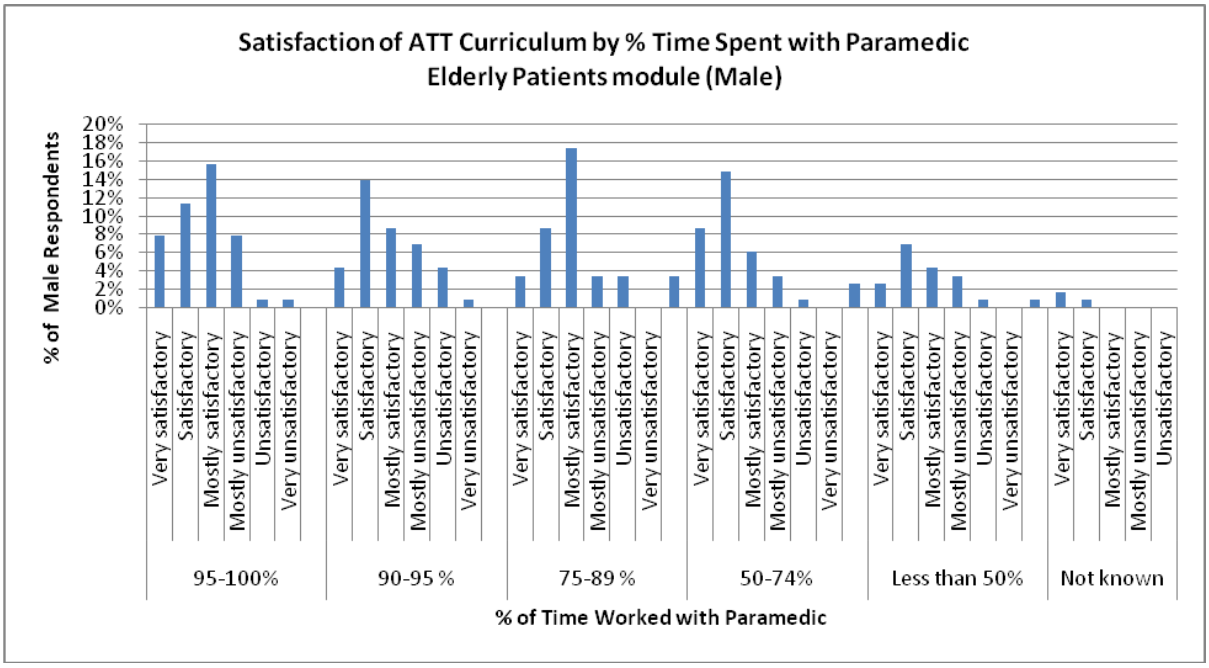


Figure 149: Technician curriculum elderly patients by time spent with paramedic (male technicians).

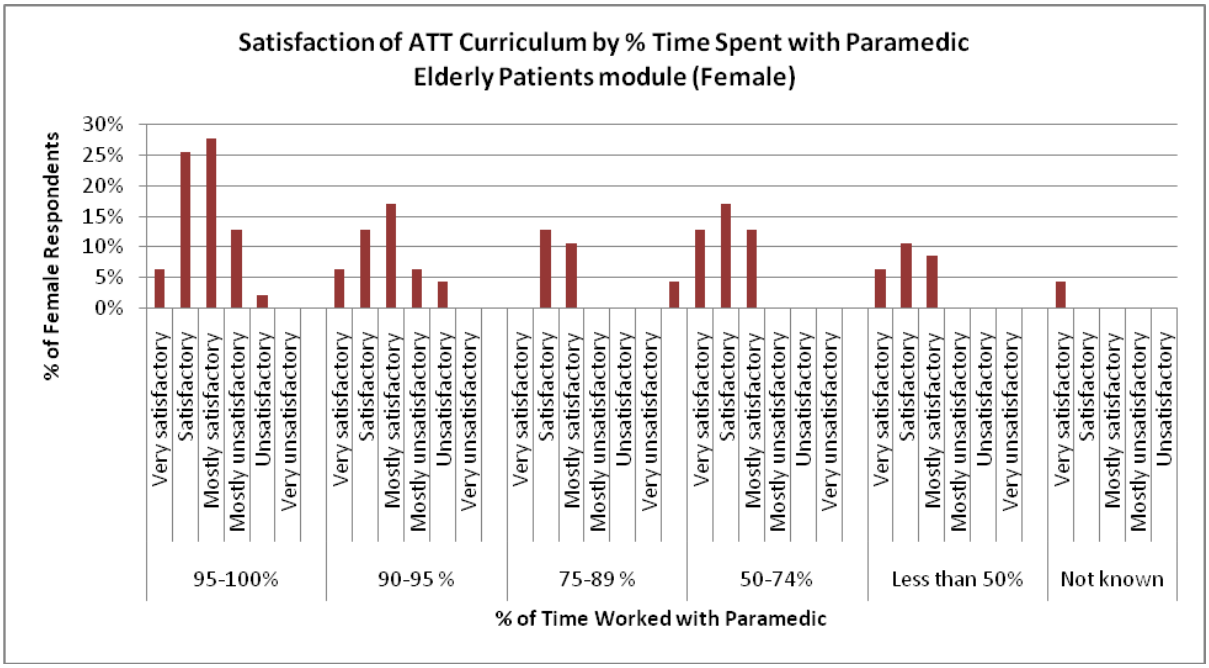


Figure 150: Technician curriculum elderly patients by time spent with paramedic (female technicians).

Management Major Incidents ATT Training Module

Table 43: Technician Curriculum & Management of Major Incidents.

		Technician or paramedic		Total
		Technician	Paramedic	
Tech curriculum &management major incidents	Very satisfactory	29	14	43
	Satisfactory	86	56	142
	Mostly satisfactory	137	137	274
	Mostly unsatisfactory	82	70	152
	Unsatisfactory	33	46	79
	Very unsatisfactory	16	26	42
Total		383	349	732

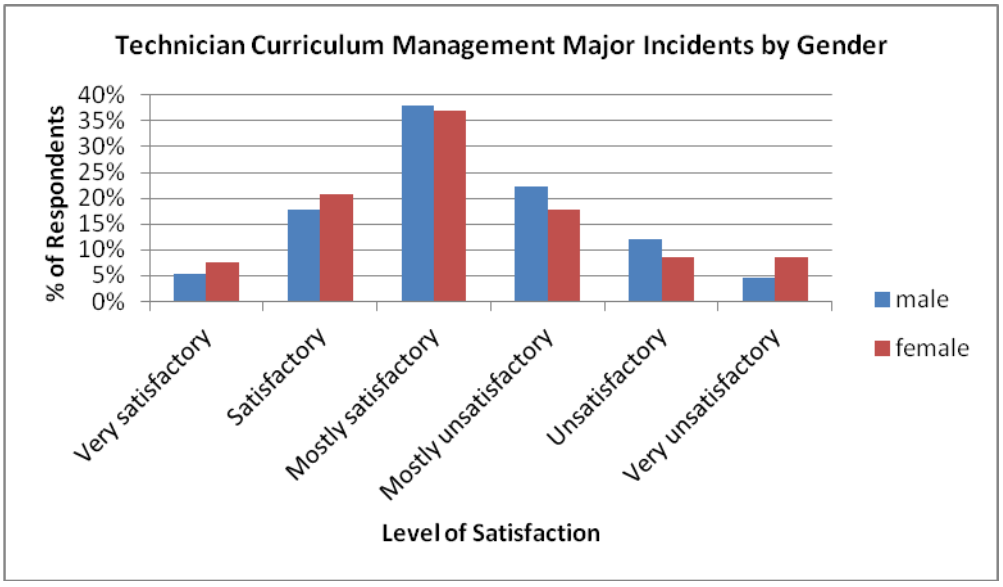


Figure 151: Management of Major Incidents by gender.

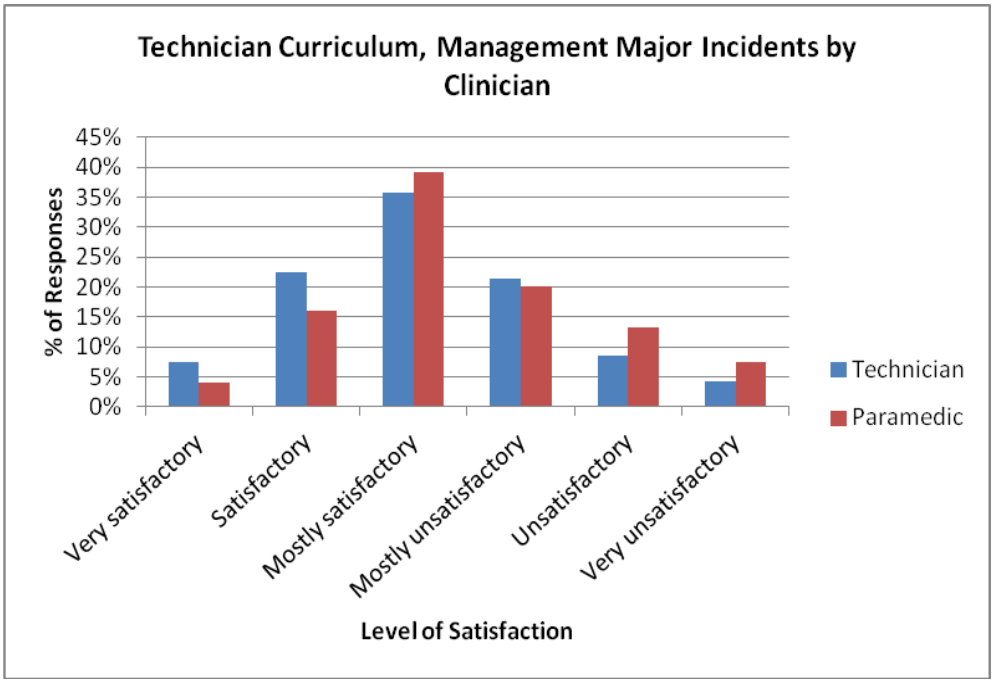


Figure 152: Management of Major Incidents by Technician and Paramedic.

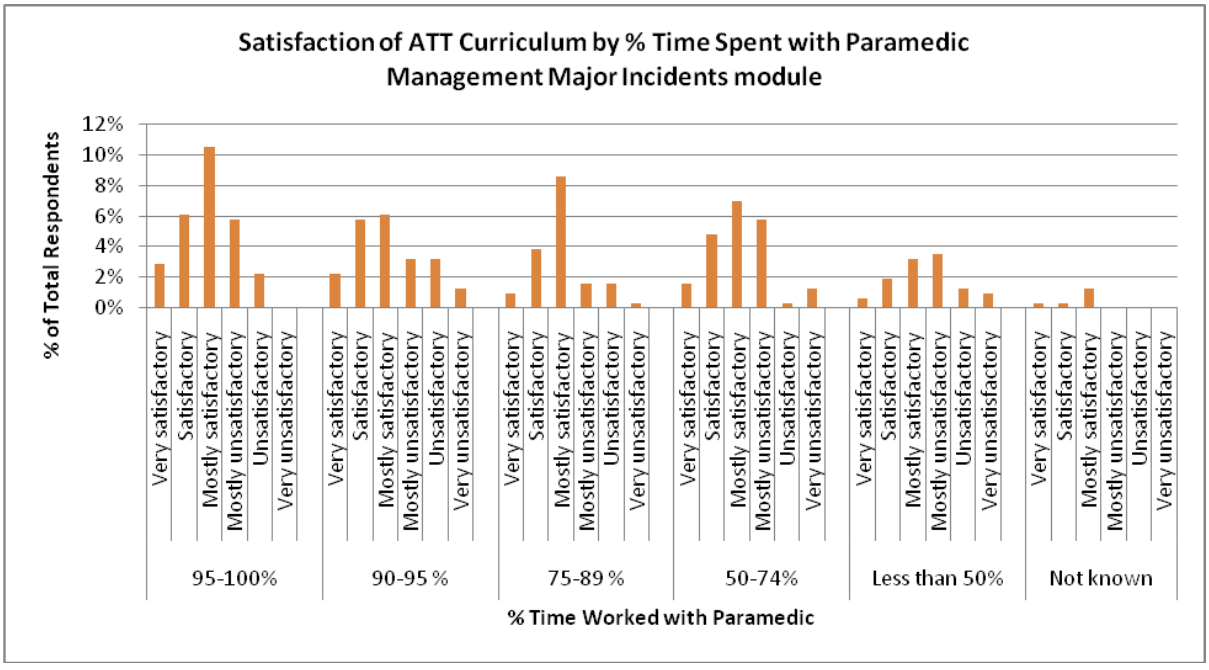


Figure 153: Technician curriculum major incidents by time spent with paramedic.

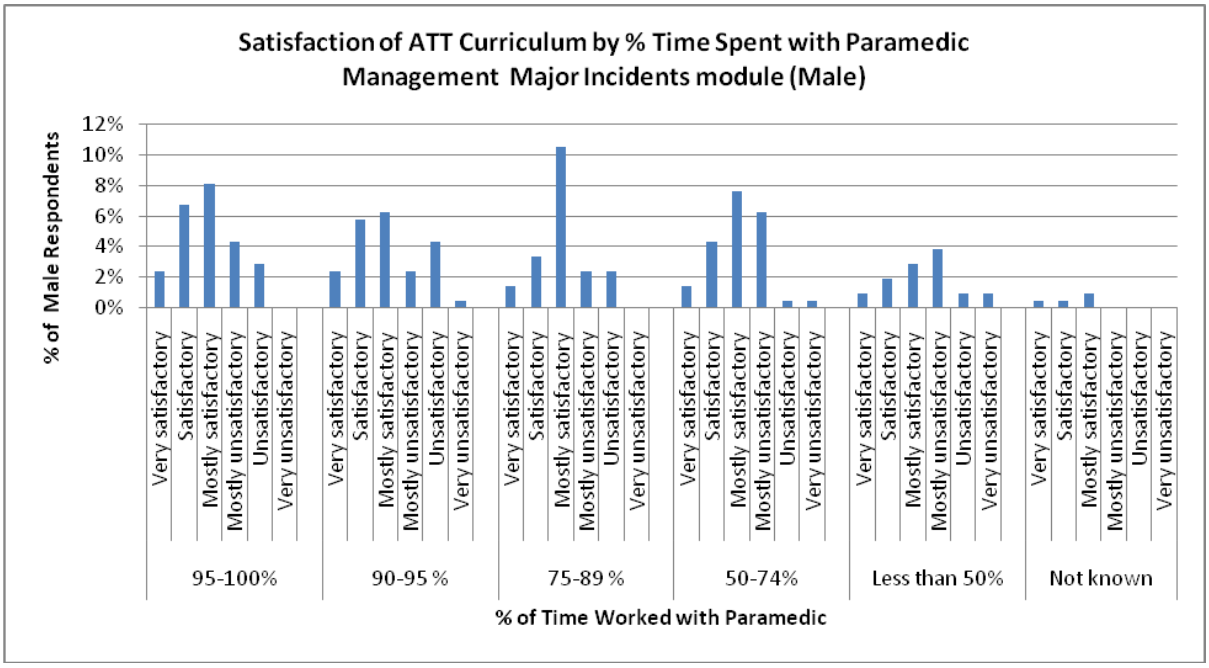


Figure 154: Technician curriculum major incidents by time spent with paramedic (male technicians).

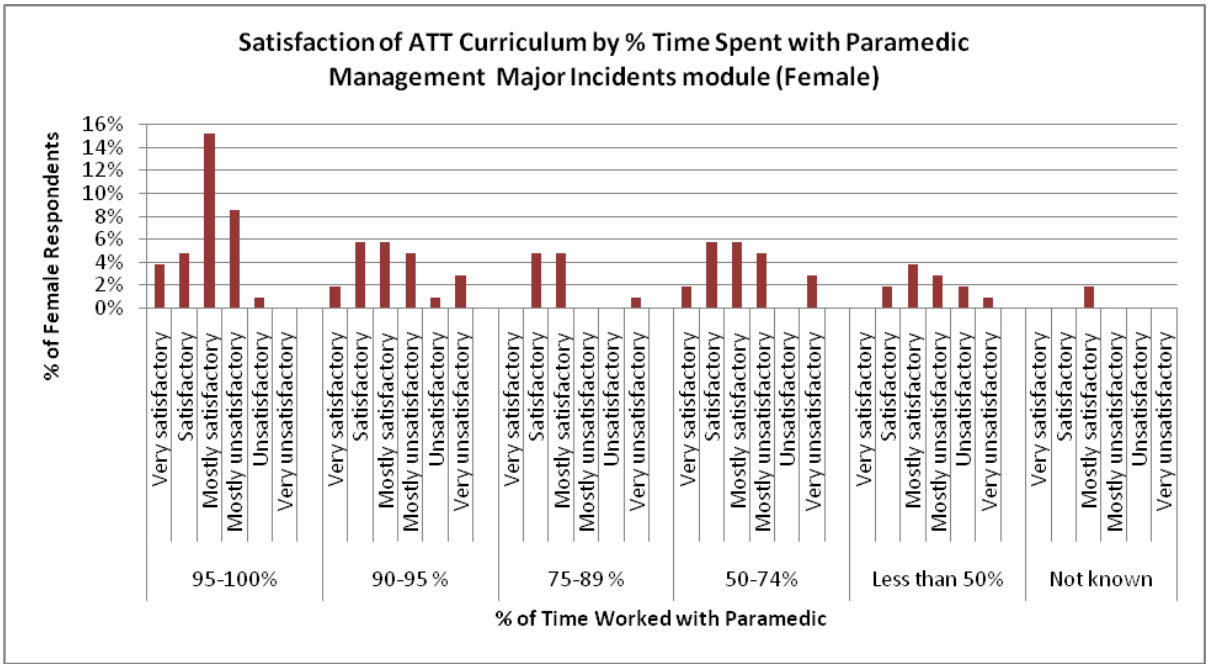


Figure 155: Technician curriculum major incidents by time spent with paramedic (female technicians).

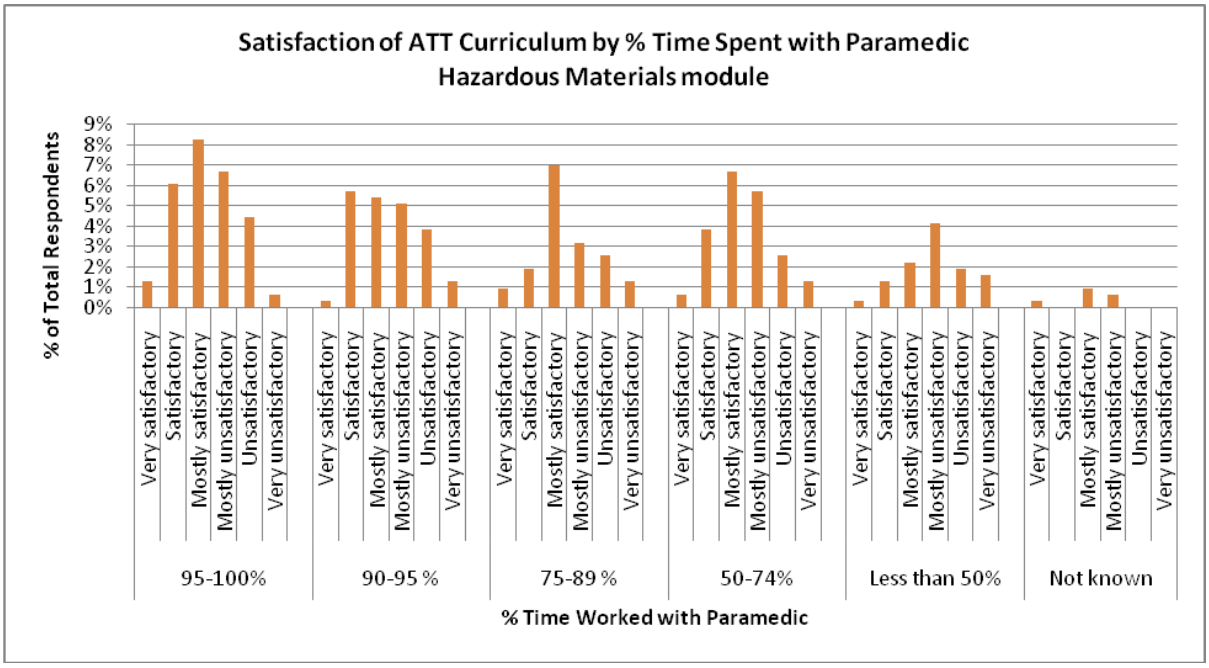


Figure 156: Technician curriculum hazardous materials by time spent with paramedic.

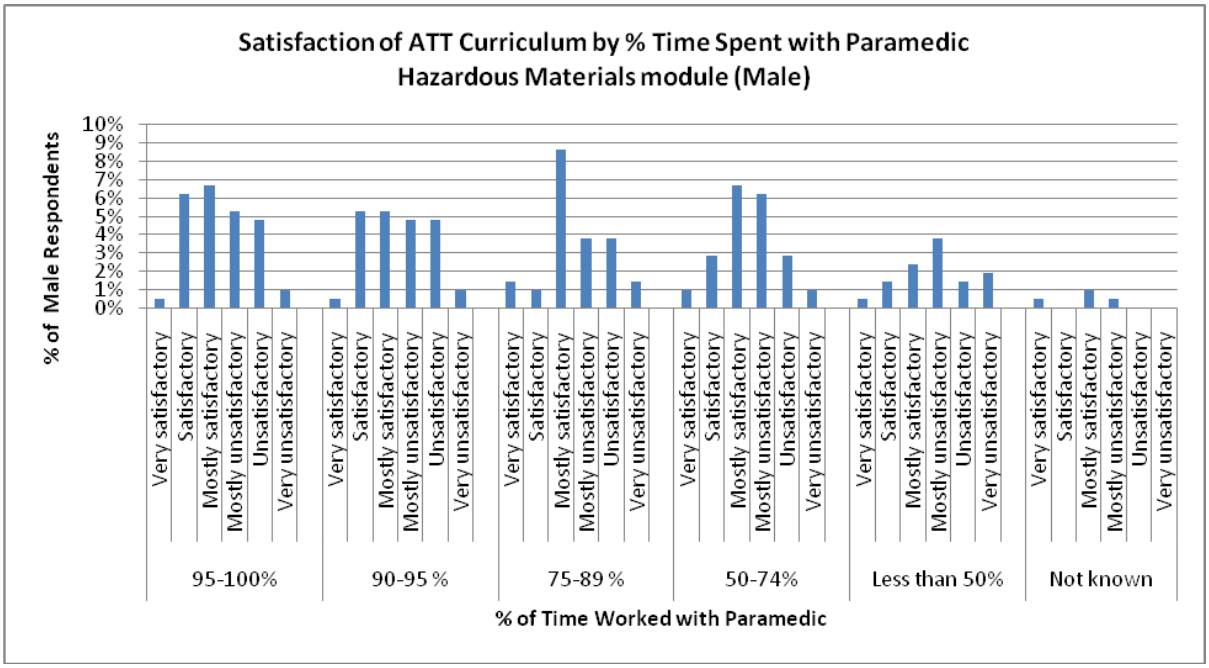


Figure 157: Technician curriculum hazardous materials by time spent with paramedic (male technicians).

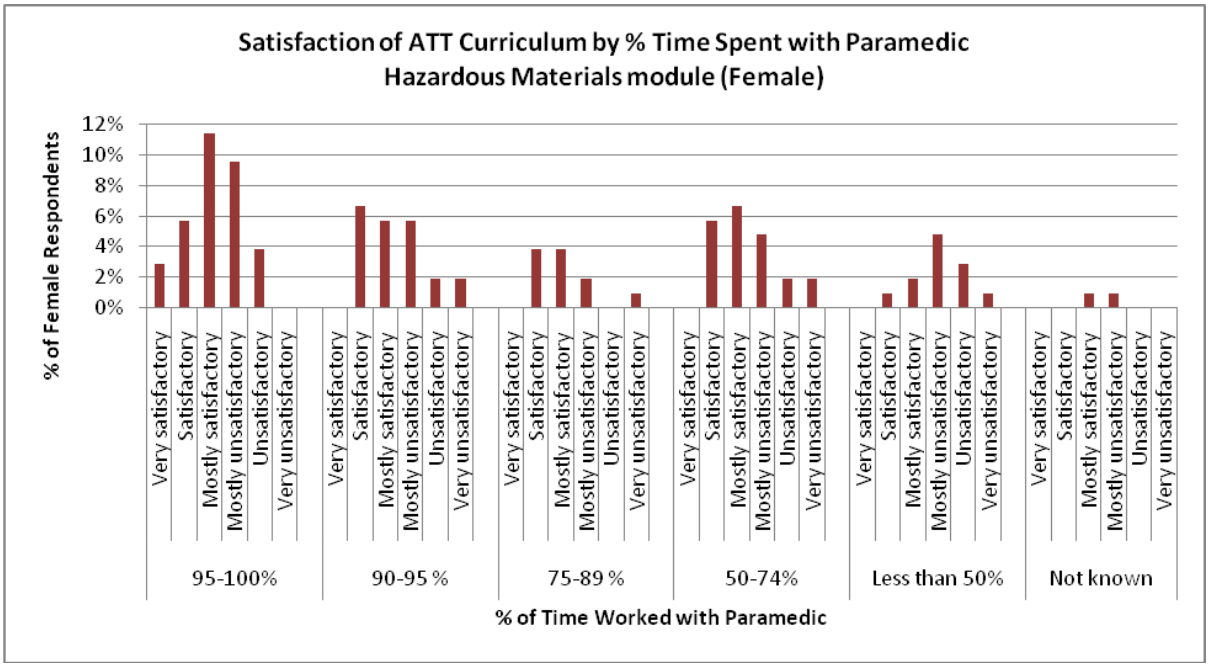


Figure 158: Technician curriculum hazardous materials by time spent with paramedic (female technicians).

Management aggression & violence ATT Training Module

Table 44: Technician Curriculum & Management Aggression & Violence

		Technician or paramedic		Total
		Technician	Paramedic	Technician
Tech curriculum & management aggression & violence	Very satisfactory	21	12	33
	Satisfactory	69	47	116
	Mostly satisfactory	105	94	199
	Mostly unsatisfactory	96	88	184
	Unsatisfactory	64	70	134
	Very unsatisfactory	28	38	66
Total		383	349	732

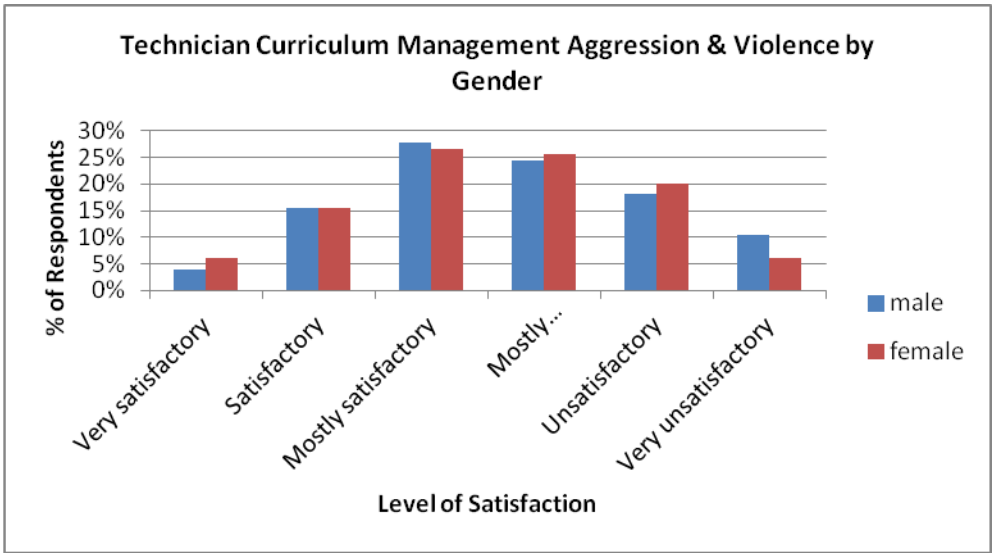


Figure 159: Management Aggression & Violence by Gender

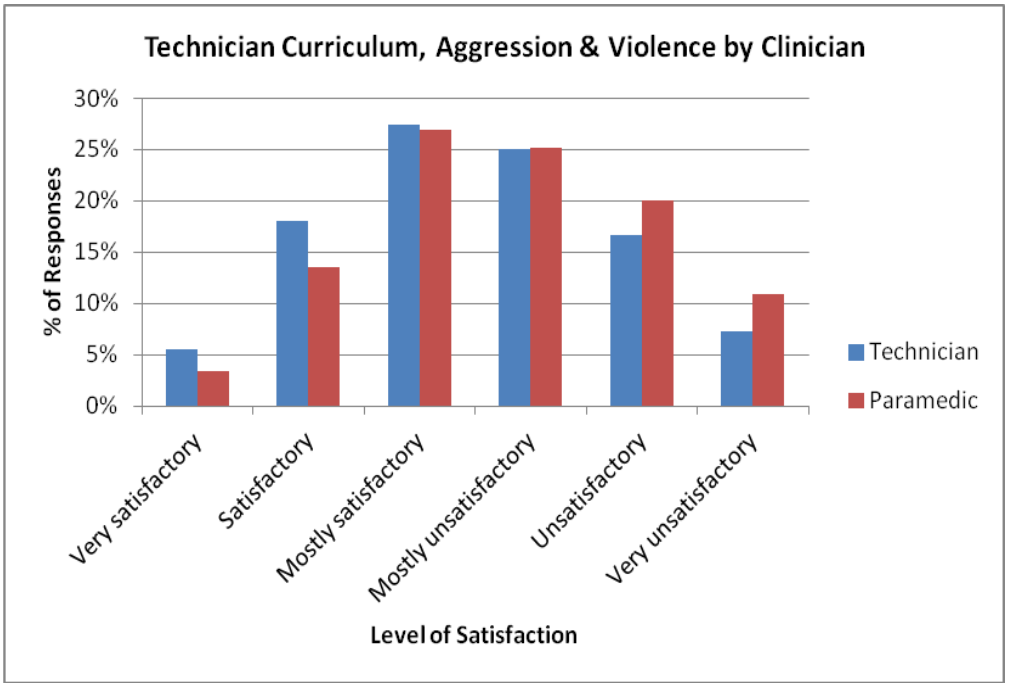


Figure 160: Management Aggression & Violence by Technician and Paramedic.

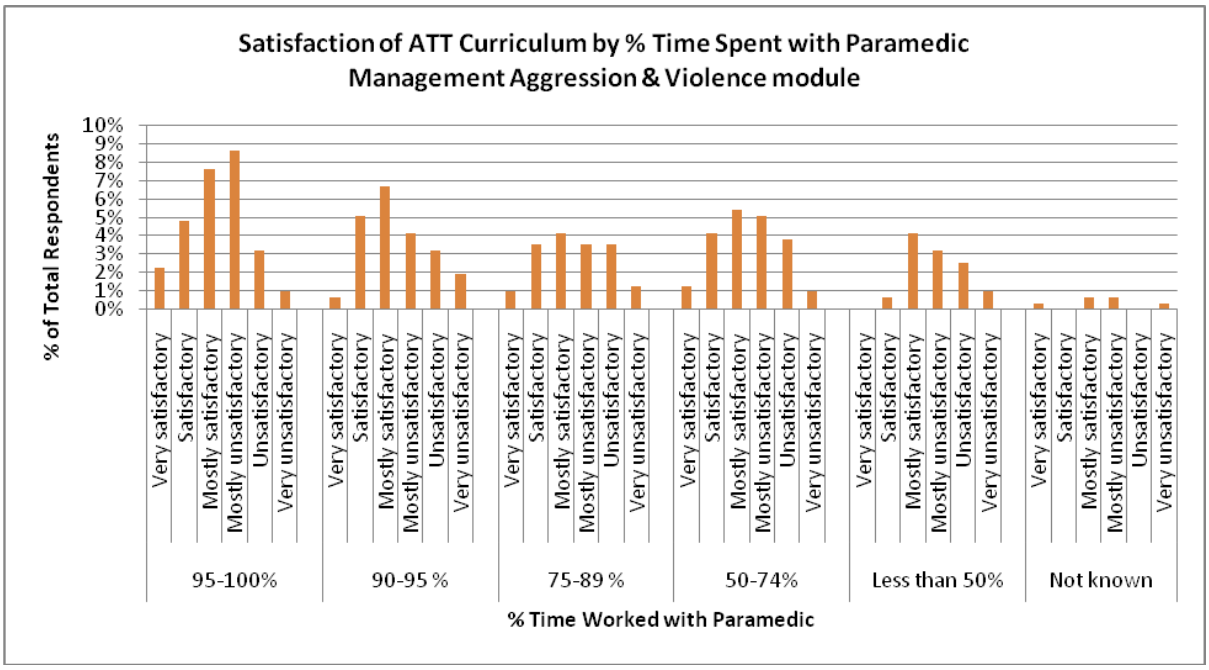


Figure 161: Technician curriculum management aggression & violence by time spent with paramedic.

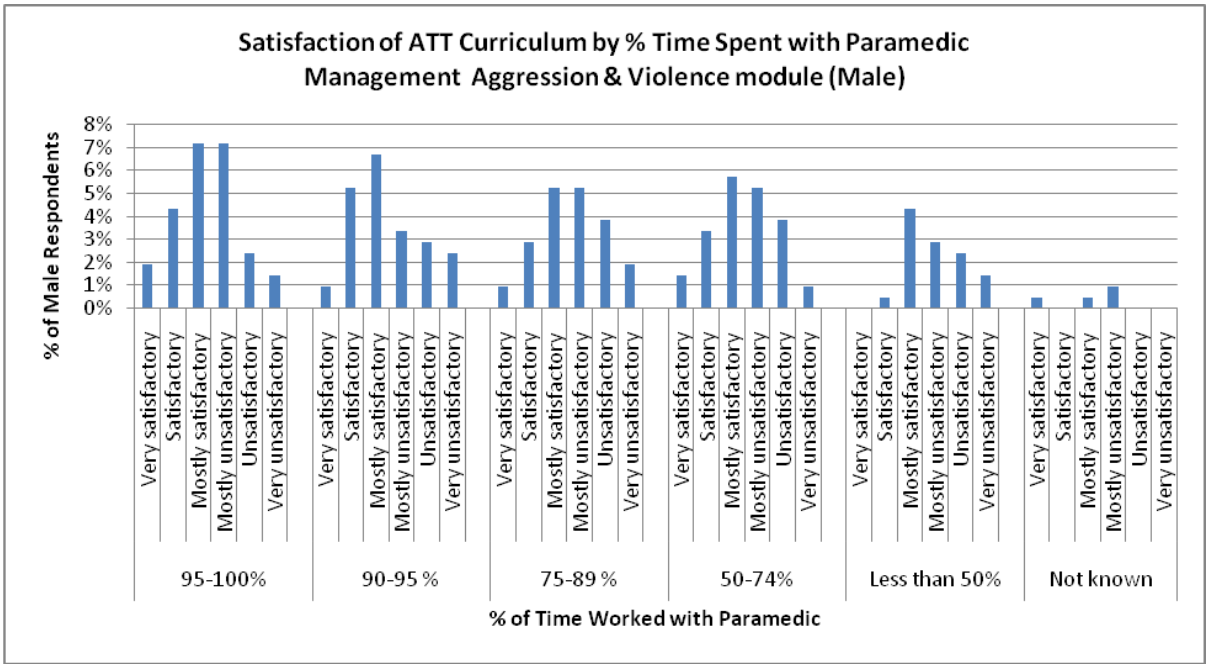


Figure 162: Technician curriculum management aggression & violence by time spent with paramedic (male technicians

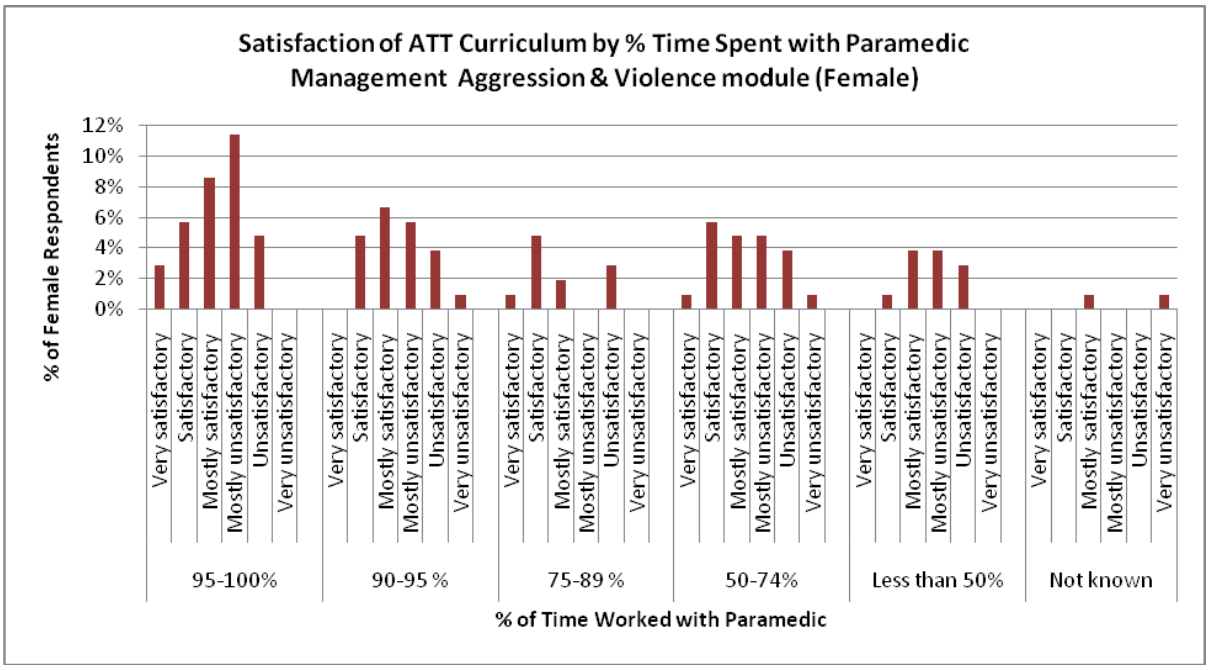


Figure 163: Technician curriculum management aggression & violence by time spent with paramedic (female technicians).

Evidence based practice ATT Training Module

Table 45: Technician Curriculum Evidence Based Practice

		Technician or paramedic		Total
		Technician	Paramedic	
Tech curriculum & evidence based practice	Very satisfactory	23	9	32
	Satisfactory	80	36	116
	Mostly satisfactory	124	102	226
	Mostly unsatisfactory	84	92	176
	Unsatisfactory	42	60	102
	Very unsatisfactory	27	50	77
Total		380	349	729

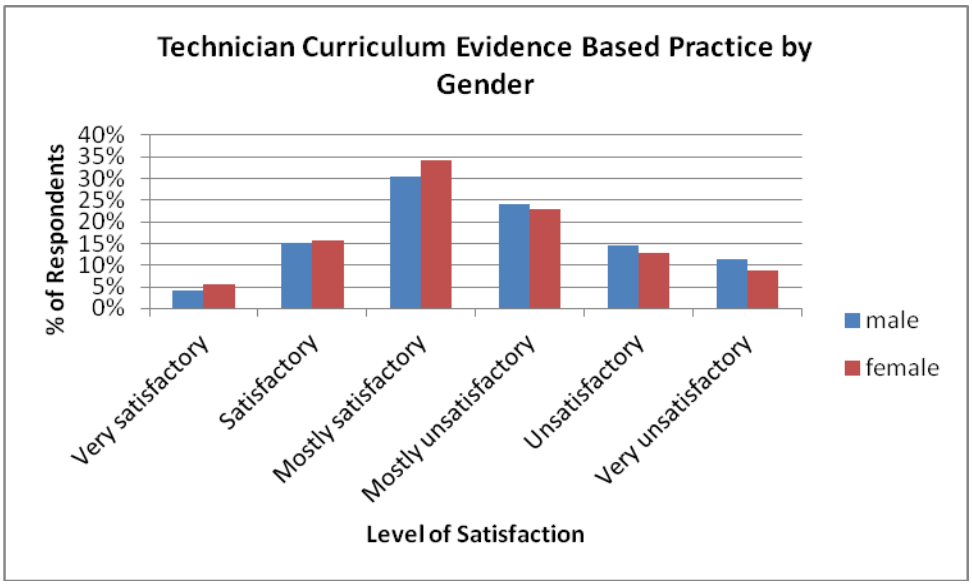


Figure 164: Technician Curriculum Evidence Based Practice by Gender.

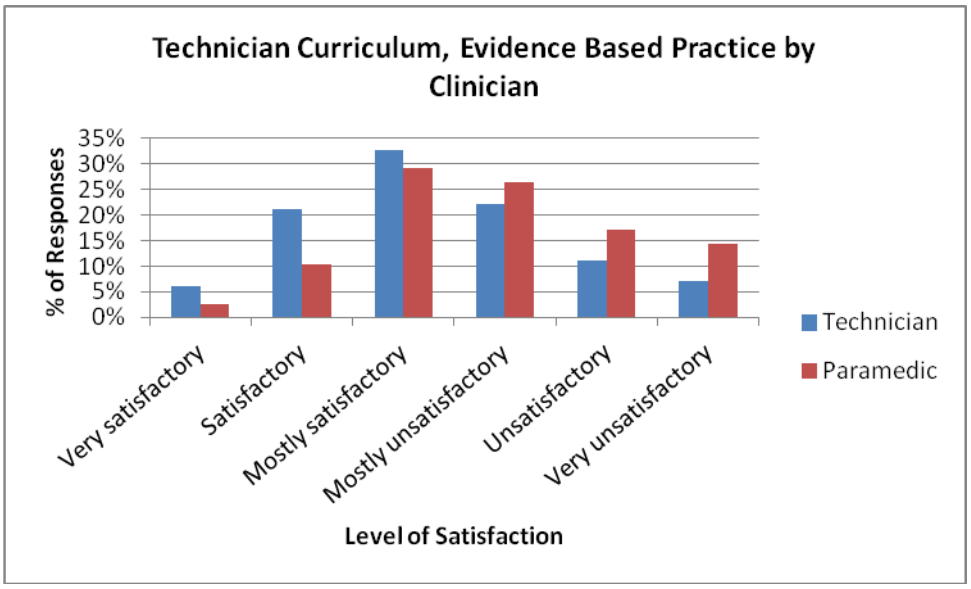


Figure 165: Technician Curriculum Evidence Based Practice by Skill Set.

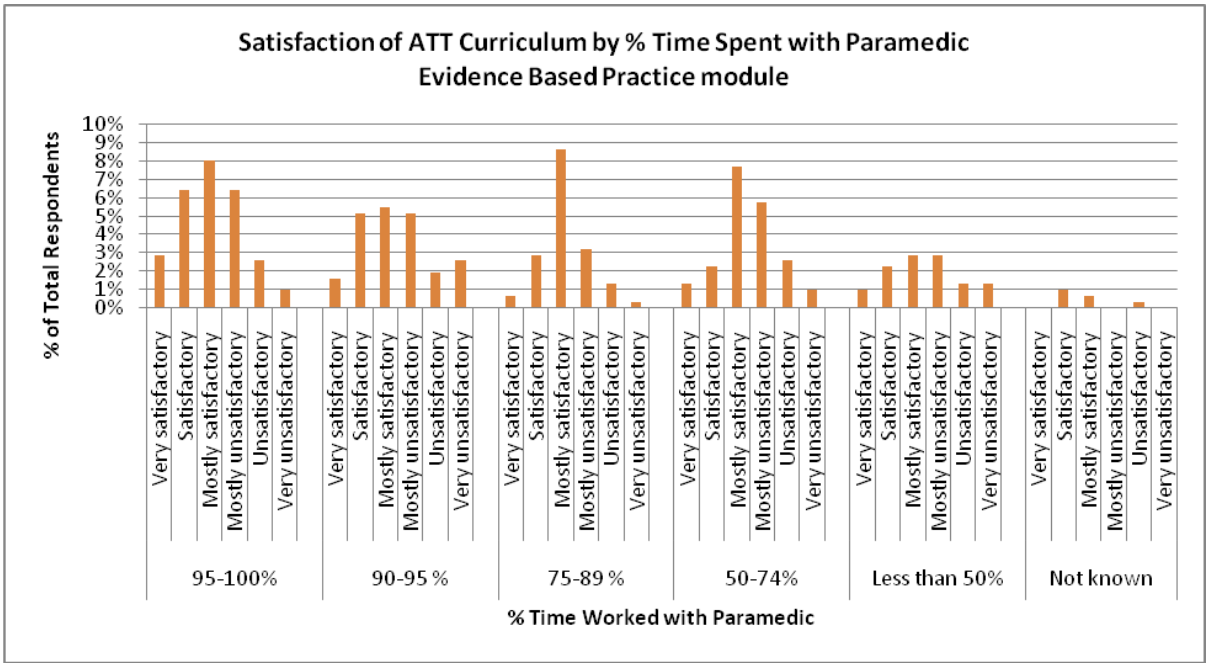


Figure 166: Technician curriculum evidence based practice by time spent with paramedic.

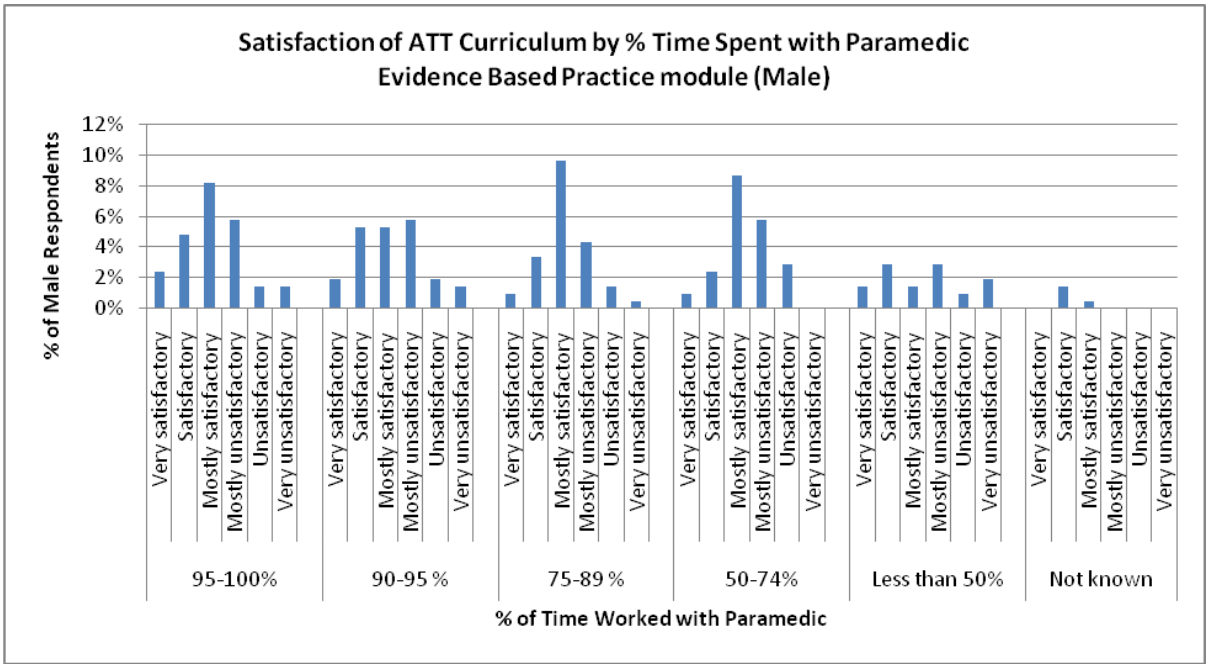


Figure 167: Technician curriculum evidence based practice by time spent with paramedic (male technicians).

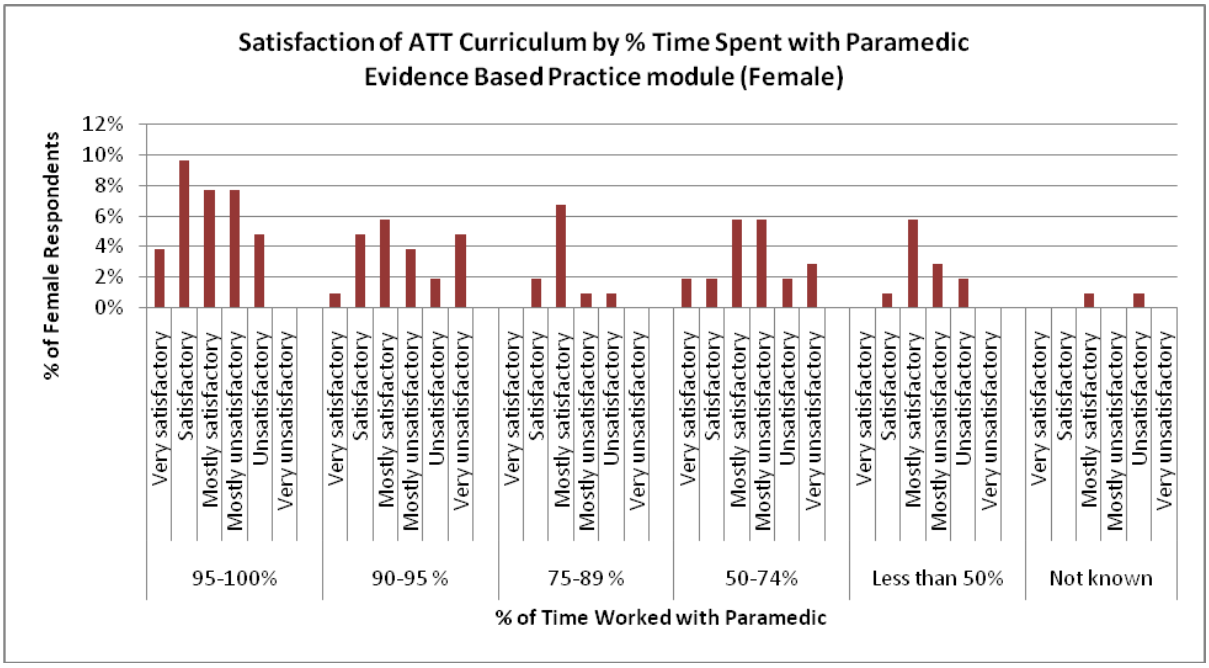


Figure 168: Technician curriculum evidence based practice by time spent with paramedic (female technicians).

Information, research & study ATT Training Module

Table 46: Technician Curriculum Information, Research & Study

		Technician or paramedic		Total
		Technician	Paramedic	
Tech curriculum &Information, research & study	Very satisfactory	19	7	26
	Satisfactory	58	29	87
	Mostly satisfactory	113	78	191
	Mostly unsatisfactory	82	102	184
	Unsatisfactory	71	66	137
	Very unsatisfactory	38	68	106
Total		381	350	731

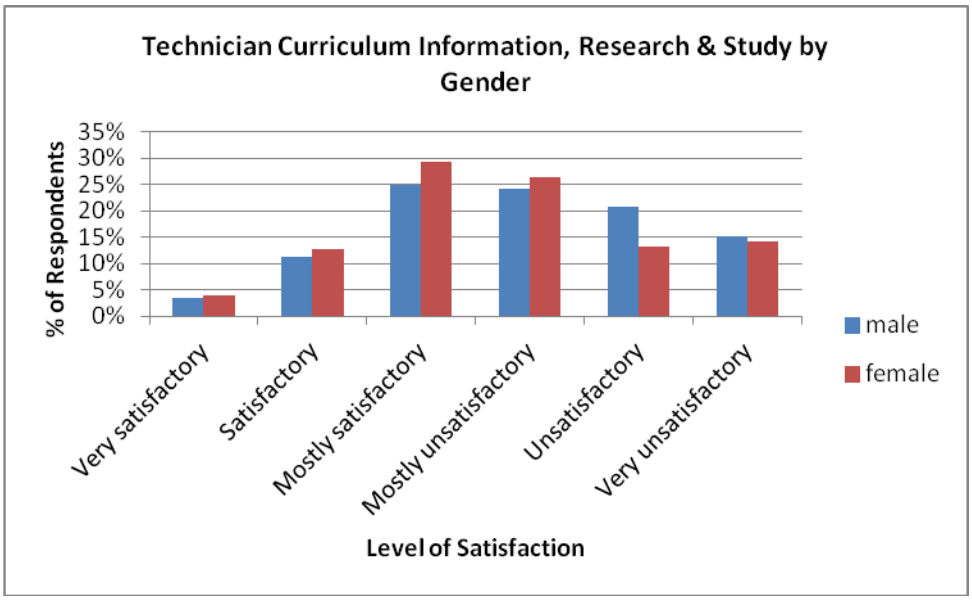


Figure 169: Technician Curriculum Information, Research & Study by Gender

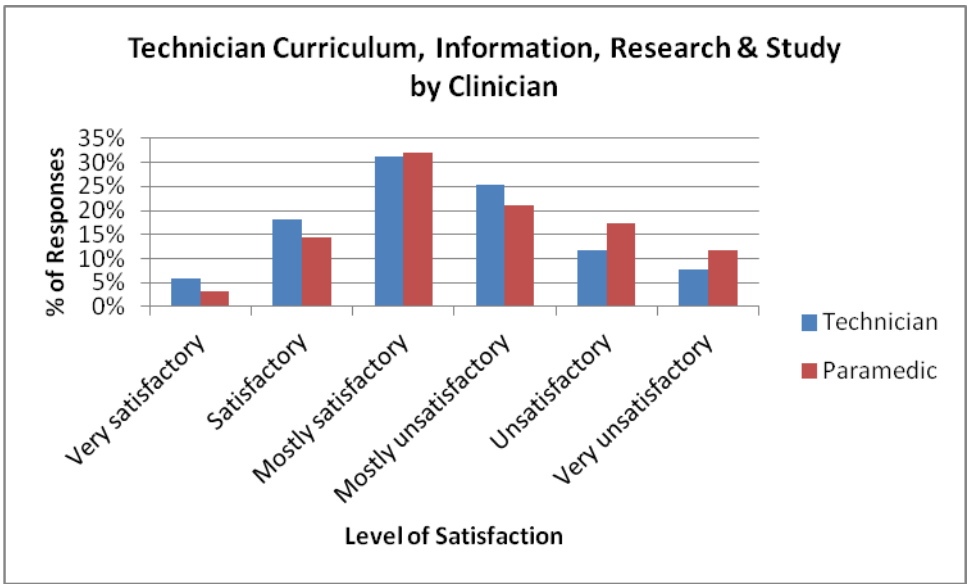


Figure 170: Technician Curriculum Information, Research & Study by Technician and Paramedic.

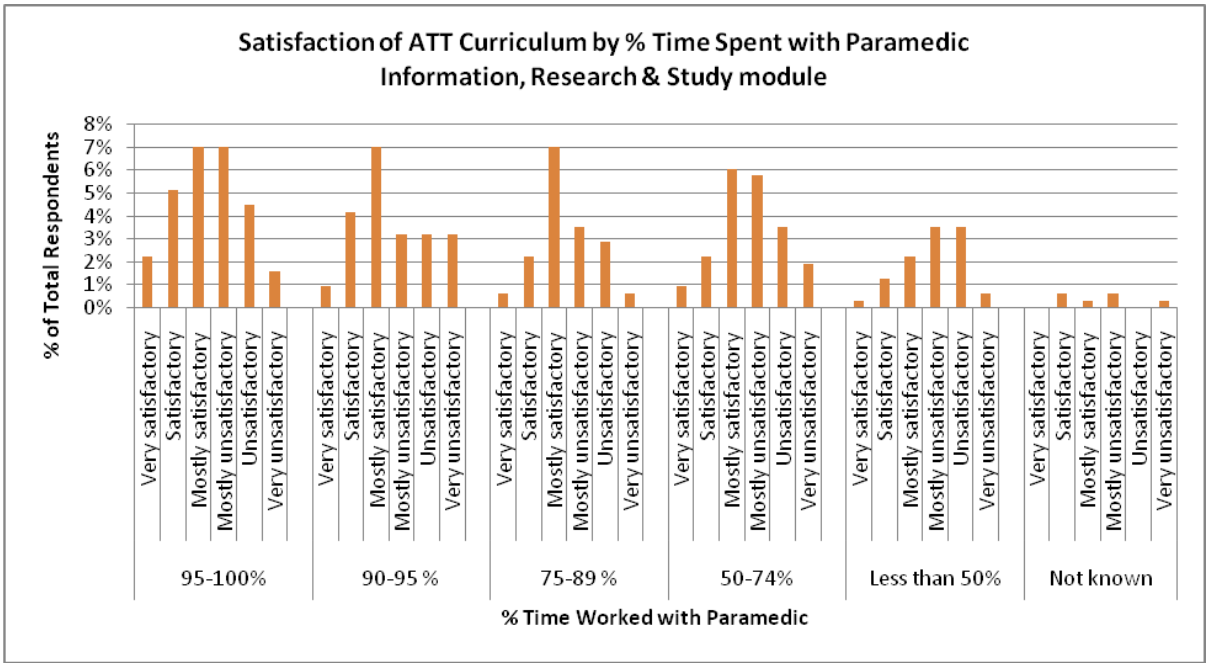


Figure 171: Technician curriculum information research & study by time spent with paramedic.

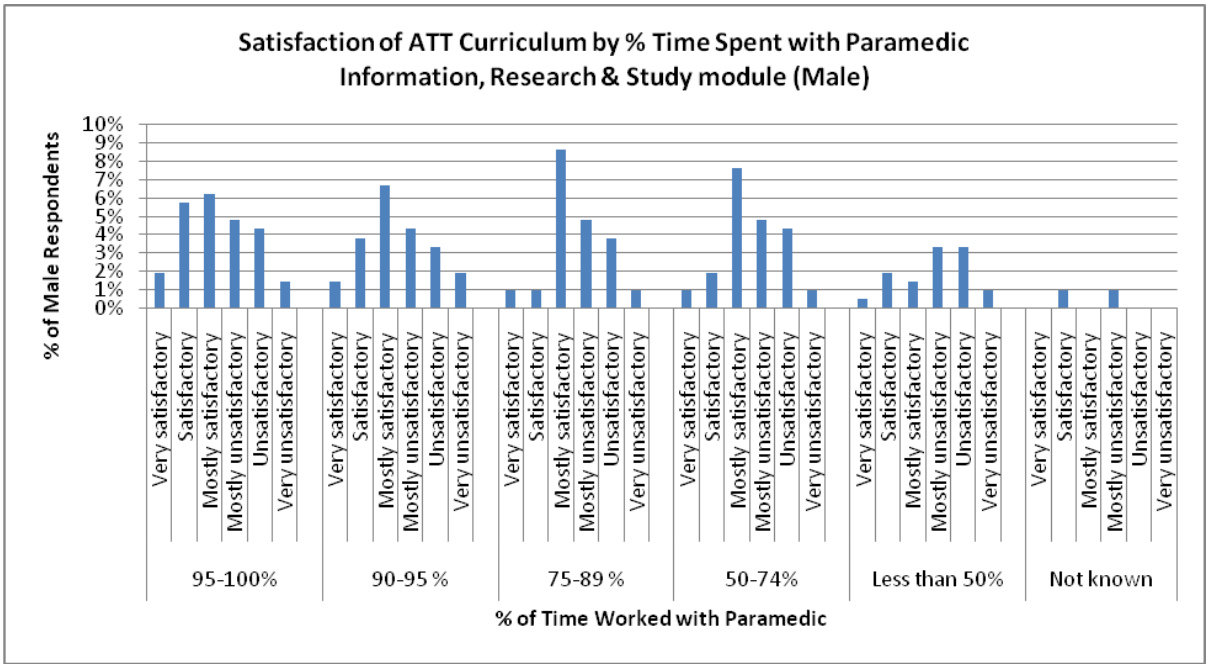


Figure 172: Technician curriculum information research & study by time spent with paramedic (male technicians).

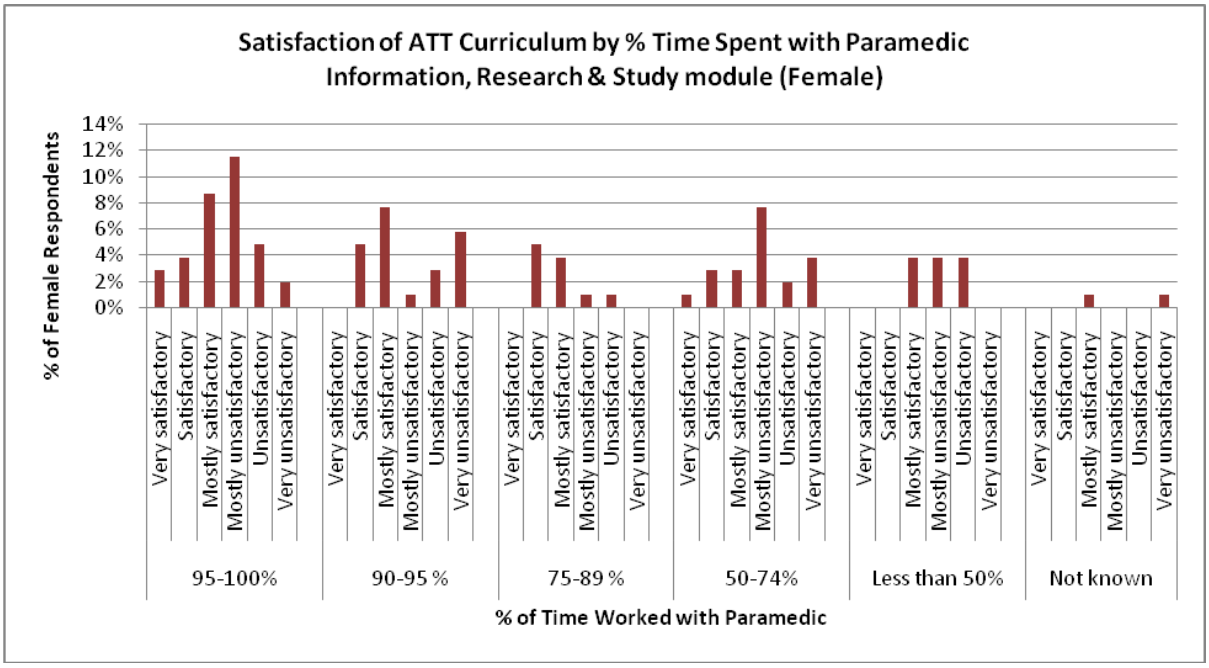


Figure 173: Technician curriculum information research & study by time spent with paramedic (female technicians).

Technician Curriculum Teamwork Skills

Table 47: Technician Curriculum Teamworking Skills

		Technician or paramedic		Total
		Technician	Paramedic	
Tech curriculum &Teamwork skills	Very satisfactory	70	21	91
	Satisfactory	105	74	179
	Mostly satisfactory	120	132	252
	Mostly unsatisfactory	47	62	109
	Unsatisfactory	26	35	61
	Very unsatisfactory	14	26	40
Total		382	350	732

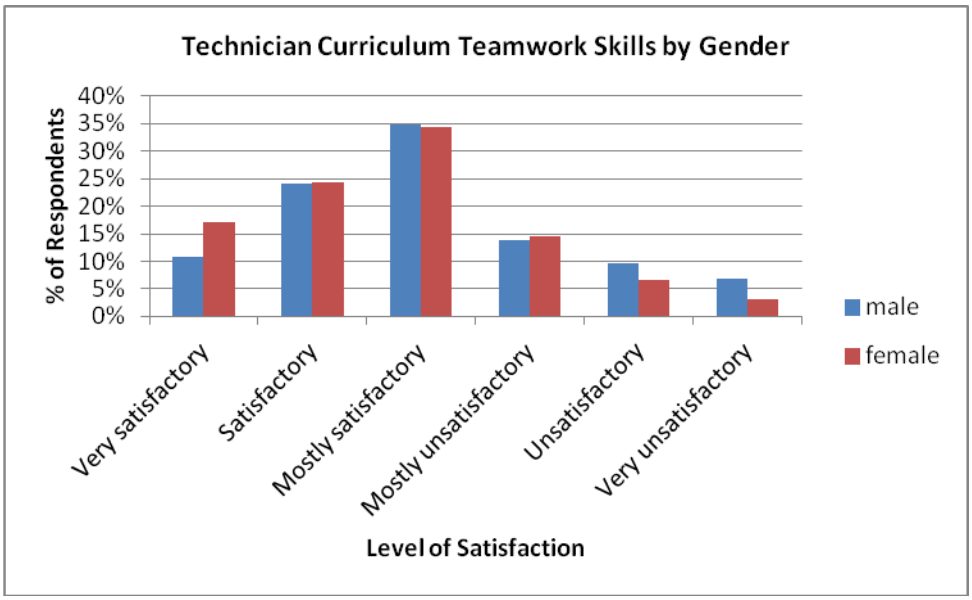


Figure 174: Technician curriculum Teamwork skills by Gender.

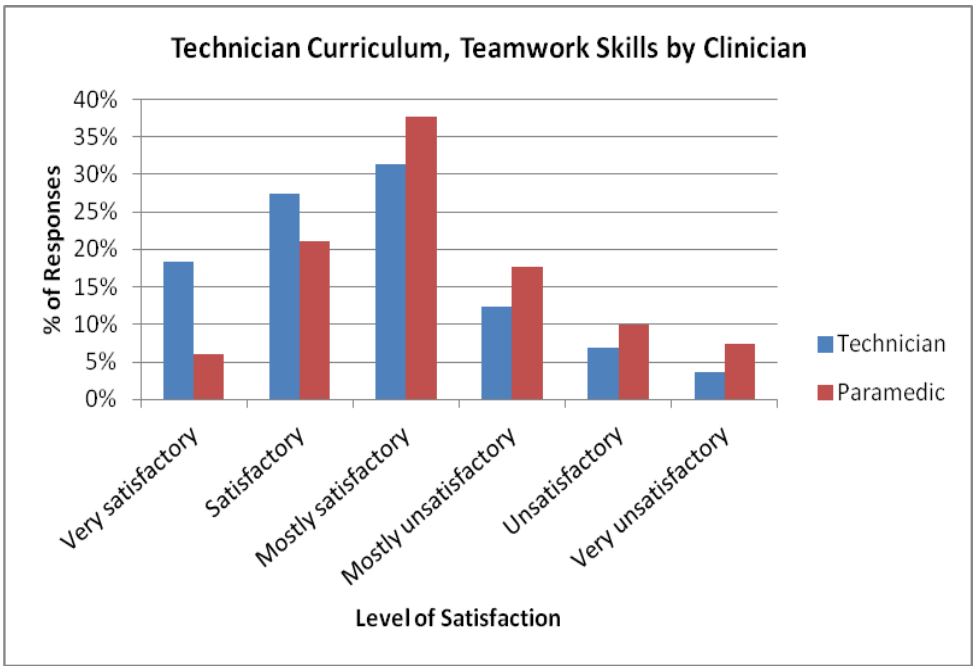


Figure 175: Technician curriculum Team work skills by skill set.

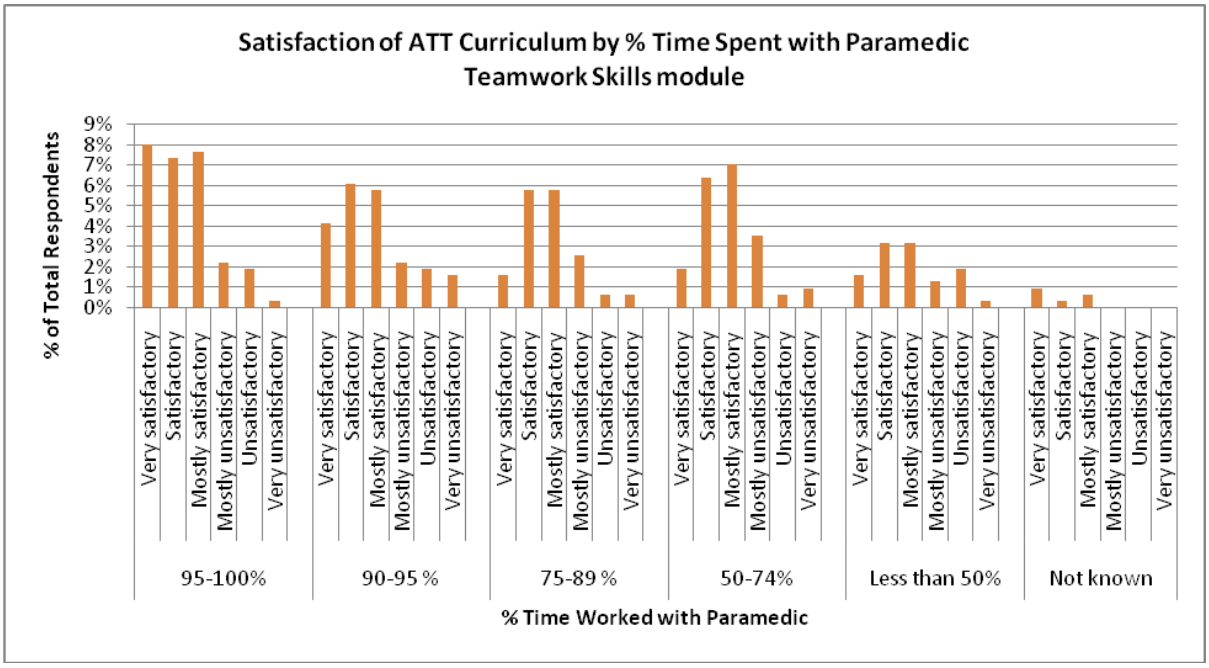


Figure 176: Technician curriculum Teamwork skills by time spent with paramedic.

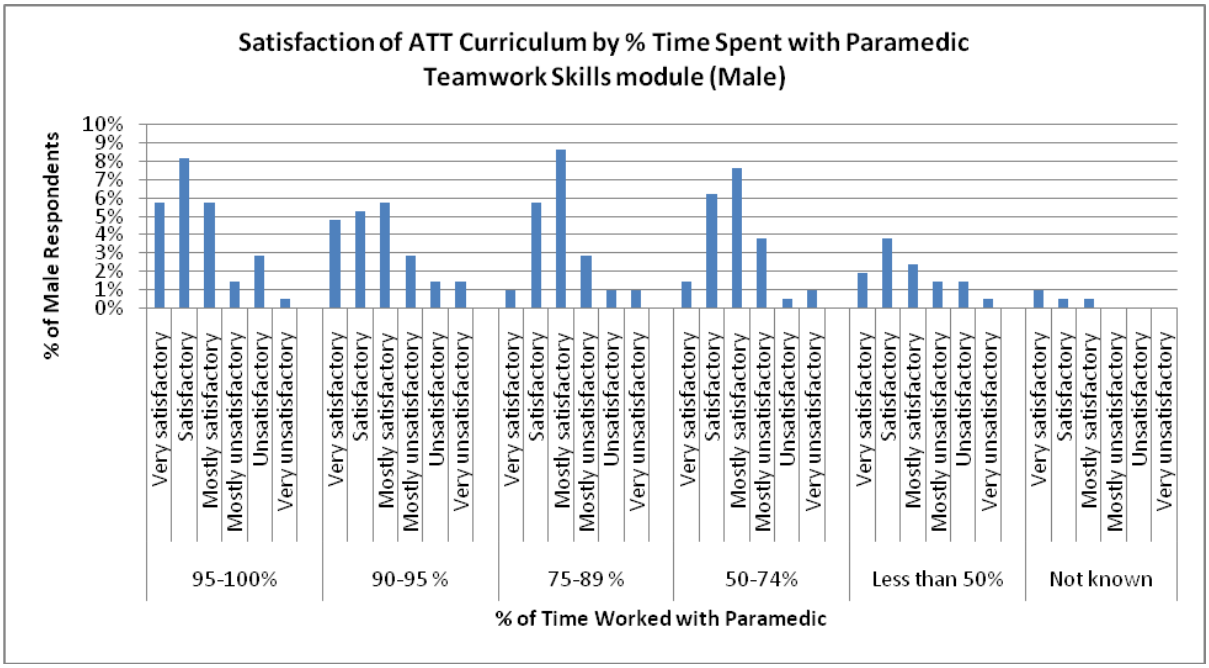


Figure 177: Technician curriculum Teamwork skills by time spent with paramedic (male technicians).

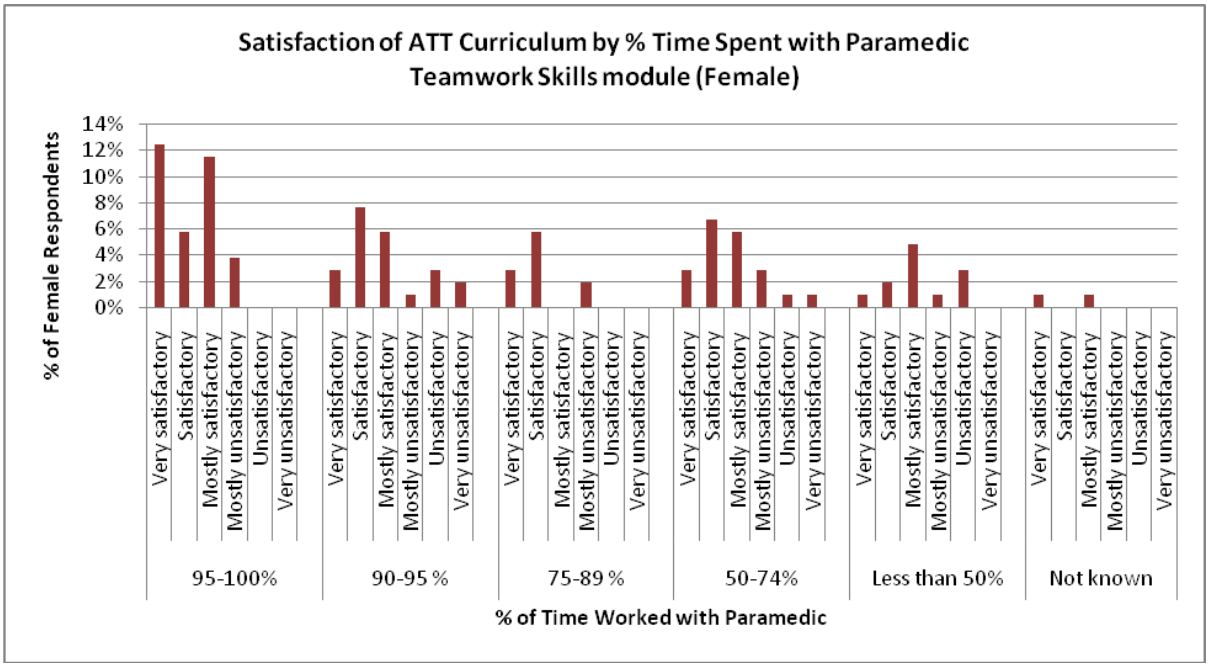


Figure 178: Technician curriculum Teamwork skills by time spent with paramedic (female technicians).

PT assessment/Primary and Social Care/Law and ethics all moved to main results section.

Para curriculum & obstetric emergencies * Gender Cross tabulation

Table 48: Paramedic Curriculum and Obstetrics

		Gender		Total
		Male	Female	Male
Para curriculum &obstetric emergencies	Very satisfactory	6	2	8
	Satisfactory	53	18	71
	Mostly satisfactory	70	20	90
	Mostly unsatisfactory	47	12	59
	Unsatisfactory	35	11	46
	Very unsatisfactory	21	6	27
Total		232	69	301

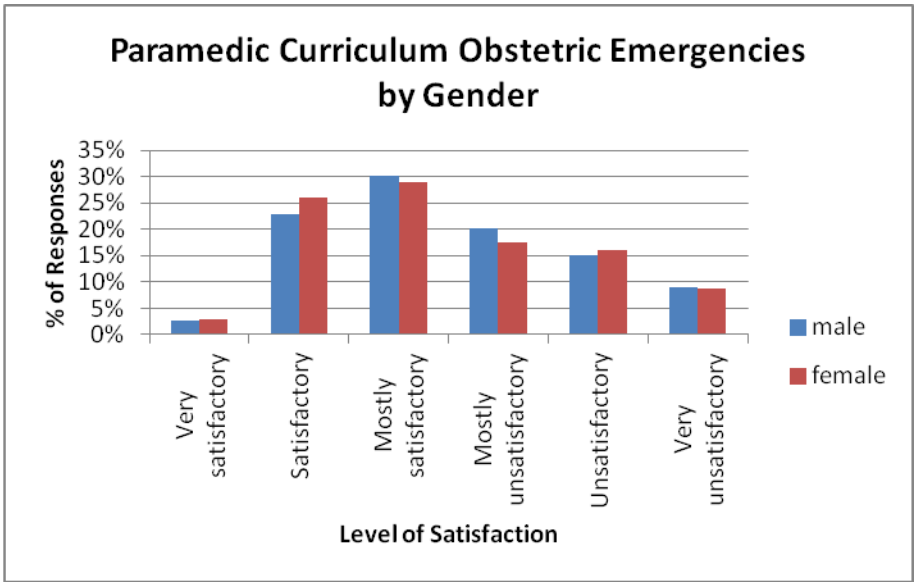


Figure 179: Paramedic Curriculum and Obstetrics.

Para curriculum & recognition of child abuse * Gender Cross-tabulation

Table 49: Paramedic Curriculum & Recognition of Child Abuse

		Gender		Total
		Male	Female	Male
Para curriculum &recognition of child abuse	Very satisfactory	1	1	2
	Satisfactory	29	7	36
	Mostly satisfactory	70	27	97
	Mostly unsatisfactory	56	17	73
	Unsatisfactory	46	14	60
	Very unsatisfactory	28	3	31
Total		230	69	299

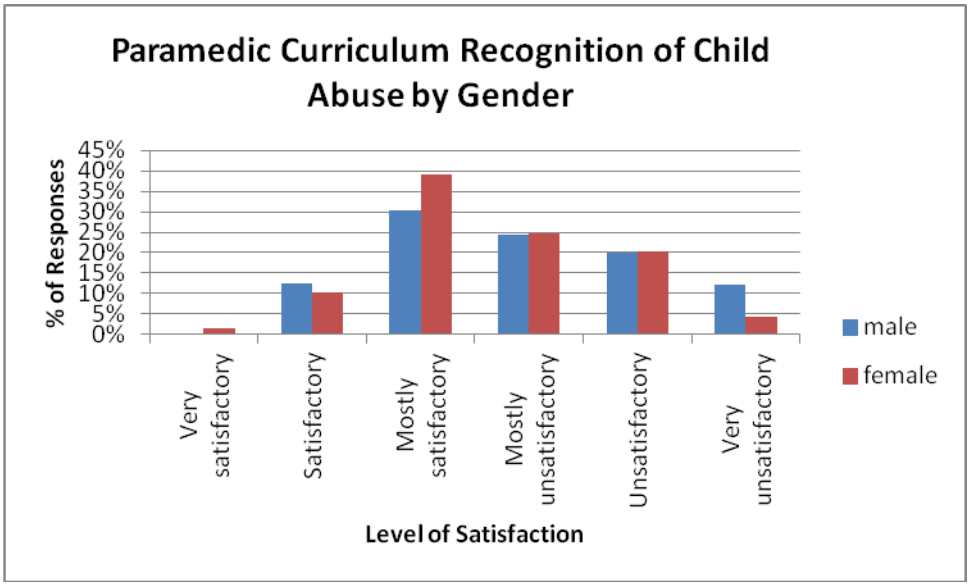


Figure 180: Paramedic Curriculum & Recognition of Child Abuse.

Para curriculum & elderly patients * Gender Cross tabulation

Table 50: Paramedic Curriculum & Elderly Patients

		Gender		Total
		Male	Female	Male
Para curriculum &elderly patients	Very satisfactory	5	0	5
	Satisfactory	49	13	62
	Mostly satisfactory	88	31	119
	Mostly unsatisfactory	49	18	67
	Unsatisfactory	27	6	33
	Very unsatisfactory	11	1	12
Total		229	69	298

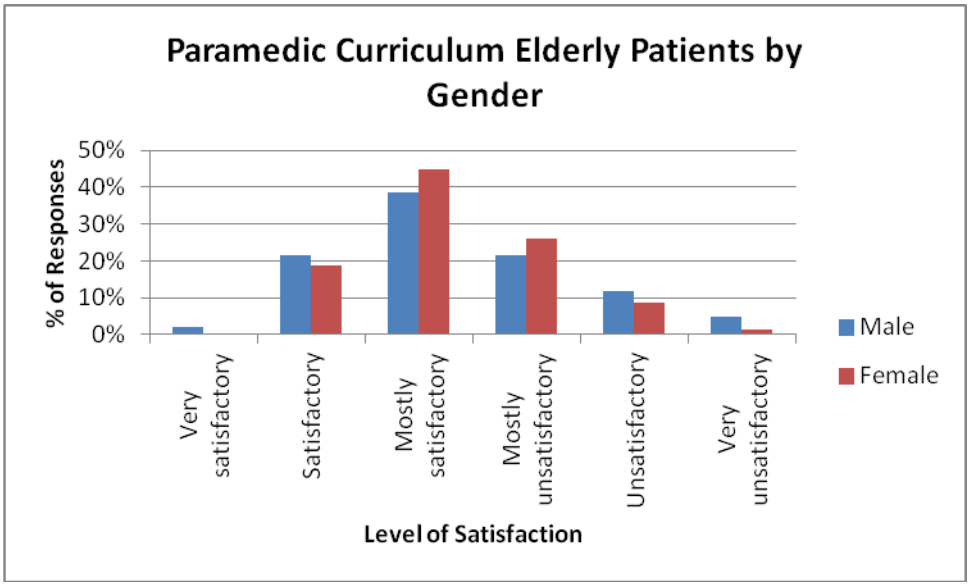


Figure 181: Paramedic Curriculum & Elderly Patients.

Para curriculum & management major incidents * Gender Cross-tabulation

Table 51: Paramedic Curriculum and Management Major Incidents

		Gender		Total
		Male	Female	Male
Para curriculum &management major incidents	Very satisfactory	5	3	8
	Satisfactory	41	11	52
	Mostly satisfactory	80	21	101
	Mostly unsatisfactory	53	17	70
	Unsatisfactory	33	11	44
	Very unsatisfactory	18	5	23
Total		230	68	298

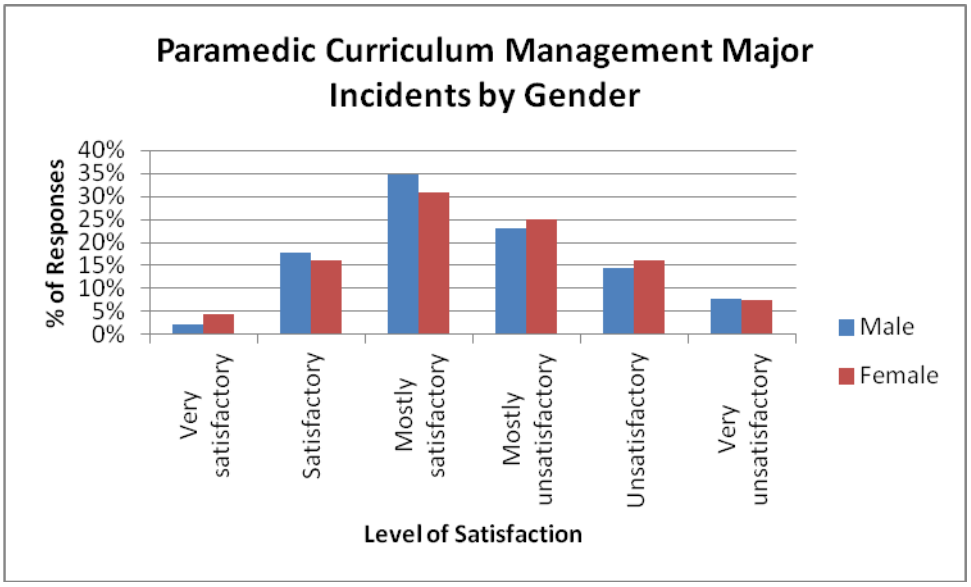


Figure 182: Paramedic Curriculum and Management Major Incidents.

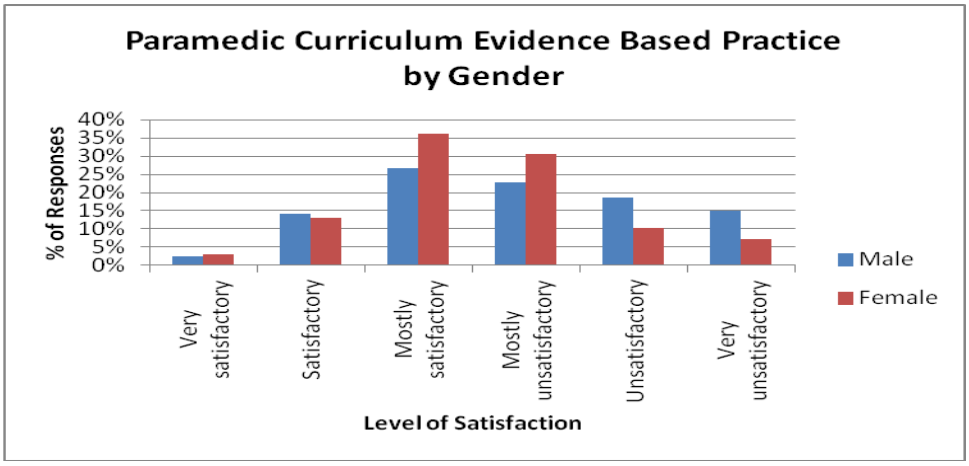


Figure 183: Paramedic Curriculum and Evidence Based Practice.

Para curriculum & Information, research & study * Gender Cross-tabulation

Table 52: Paramedic Curriculum and Information, Research & Study.

		Gender		Total
		Male	female	male
Para curriculum &Information, research & study	Very satisfactory	4	1	5
	Satisfactory	25	6	31
	Mostly satisfactory	56	19	75
	Mostly unsatisfactory	53	25	78
	Unsatisfactory	51	10	61
	Very unsatisfactory	43	8	51
Total		232	69	301

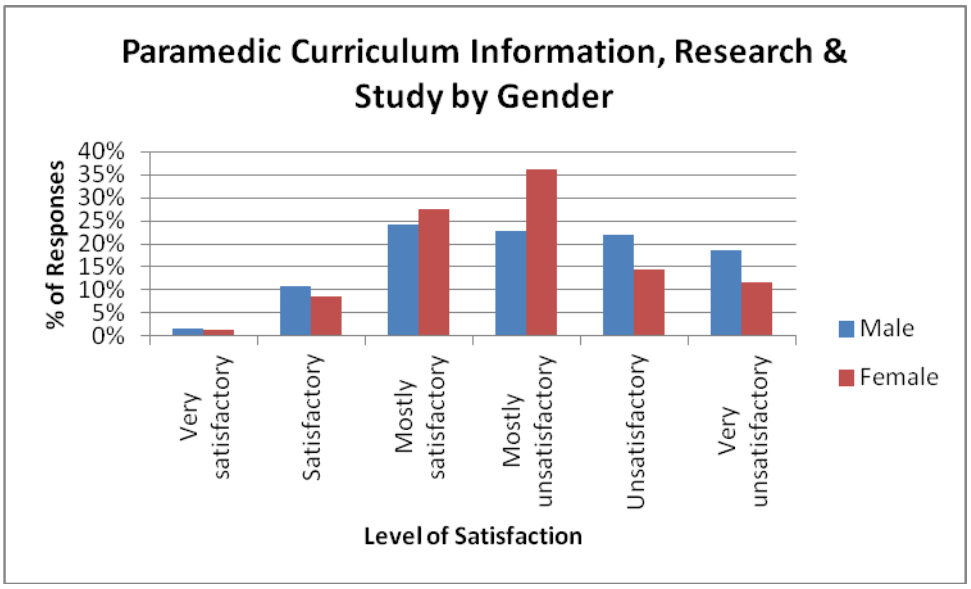


Figure 184: Paramedic Curriculum and Information, Research & Study.

Para curriculum & Teamwork skills * Gender Cross-tabulation

Table 53: Paramedic Curriculum and Teamwork Skills

		Gender		Total
		male	female	male
Para curriculum &Teamwork skills	Very satisfactory	13	6	19
	Satisfactory	62	15	77
	Mostly satisfactory	80	30	110
	Mostly unsatisfactory	33	9	42
	Unsatisfactory	25	5	30
	Very unsatisfactory	19	4	23
Total		232	69	301

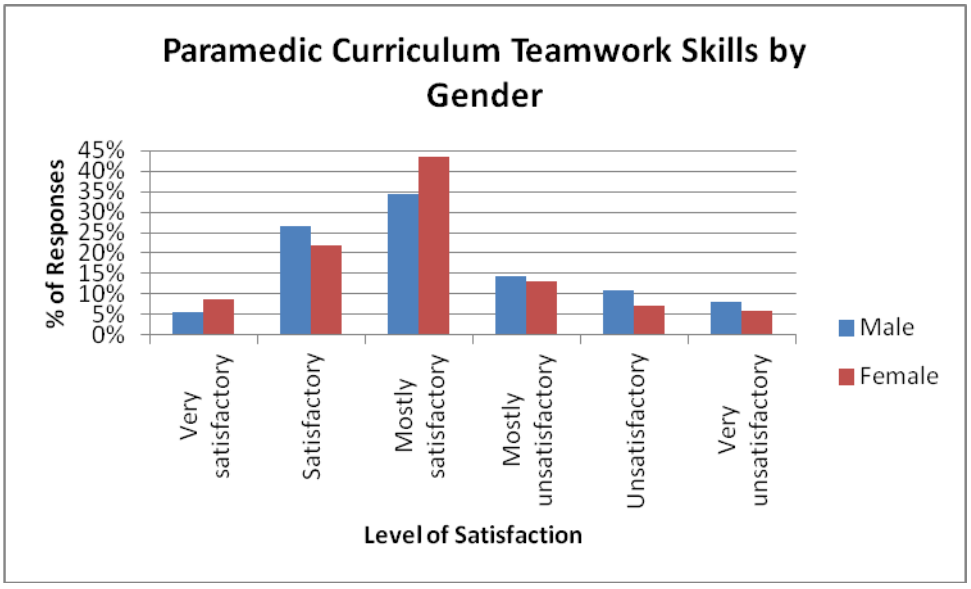


Figure 185: Paramedic Curriculum and Teamwork Skills.

Appendix VIII

NHS AHP/CoP Career Framework for Paramedics

5.1 The Framework