



**Health
Information
and Quality
Authority**

An tÚdarás Um Fhaisnéis
agus Cáilíocht Sláinte

Review of pre-hospital
emergency care services
to ensure high quality in
the assessment, diagnosis,
clinical management and
transporting of acutely ill
patients to appropriate
healthcare facilities

2 December 2014

Safer Better Care

About the Health Information and Quality Authority

The Health Information and Quality Authority (HIQA) is the independent Authority established to drive high quality and safe care for people using our health and social care services. HIQA's role is to promote sustainable improvements, safeguard people using health and social care services, support informed decisions on how services are delivered, and promote person-centred care for the benefit of the public.

The Authority's mandate to date extends across the quality and safety of the public, private (within its social care function) and voluntary sectors. Reporting to the Minister for Health and the Minister for Children and Youth Affairs, the Health Information and Quality Authority has statutory responsibility for:

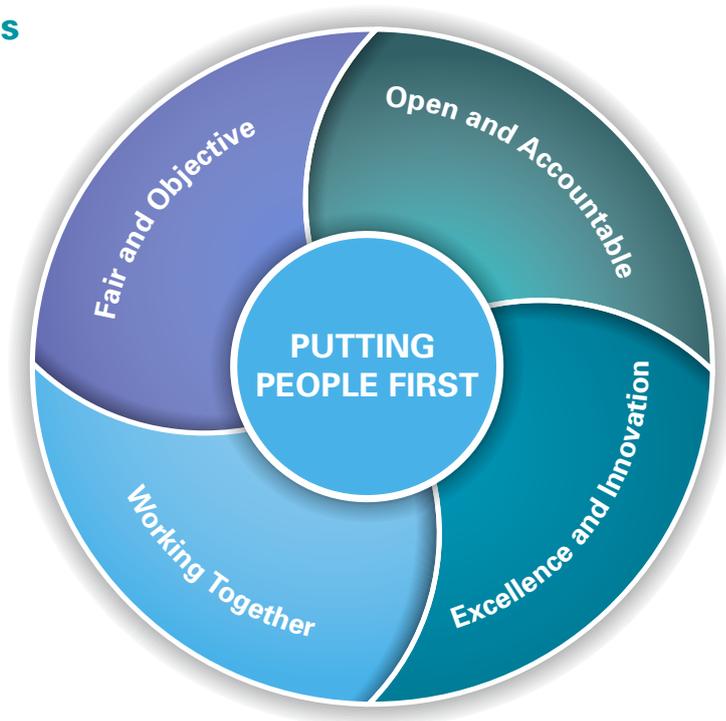
- **Setting Standards for Health and Social Services** — Developing person-centred standards, based on evidence and best international practice, for those health and social care services in Ireland that by law are required to be regulated by the Authority.
- **Supporting Improvement** — Supporting health and social care services to implement standards by providing education in quality improvement tools and methodologies.
Social Services Inspectorate — Registering and inspecting residential centres for dependent people and inspecting children detention schools, foster care services and child protection services.
- **Monitoring Healthcare Quality and Safety** — Monitoring the quality and safety of health and personal social care services and investigating as necessary serious concerns about the health and welfare of people who use these services.
- **Health Technology Assessment** — Ensuring the best outcome for people who use our health services and best use of resources by evaluating the clinical and cost-effectiveness of drugs, equipment, diagnostic techniques and health promotion activities.
- **Health Information** — Advising on the efficient and secure collection and sharing of health information, evaluating information resources and publishing information about the delivery and performance of Ireland's health and social care services.

Our mission

The mission of the Authority is derived from the statutory functions described in the Health Act 2007 and can be summarised as:

“Drive high quality and safe care for people using our health and social services.”

Our values



- **Putting people first** — we will put the needs and the voices of service users, and those providing them, at the centre of all of our work.
- **Fair and objective** — we will be fair and objective in our dealings with people and organisations, and undertake our work without fear or favour.
- **Open and accountable** — we will share information about the nature and outcomes of our work, and accept full responsibility for our actions.
- **Excellence and innovation** — we will strive for excellence in our work, and seek continuous improvement through self-evaluation and innovation.
- **Working together** — we will engage with people providing and people using the services in developing all aspects of our work.

Find out more on the Authority’s website: www.hiqa.ie.

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Glossary of terms and abbreviations used in this report

Accountability: being answerable to another person or organisation for decisions, behaviours and any consequences.

Advanced paramedic: highly trained, experienced paramedics who undergo rigorous upskilling to enable clinical interventions to be provided to patients beyond those already embedded through paramedic practice. This includes training in advanced life support. Enhanced clinical judgment is a key competency required for this grade.

Alternative care pathways: care pathways provided for patients with specific conditions used as an alternative to transporting the patient to an ED.

Ambulance clear time: the time when the patient has been handed over to medical staff in the emergency department and the ambulance crew are ready to respond to another call.

AMPDS: Advanced Medical Priority Dispatch System, an emergency call prioritisation system.

AQUA: Advanced Quality Assurance reports

Authorised person: a person appointed by the Authority (with the approval of the Minister for Health and Children, with the consent of the Minister for Finance) for the purposes of monitoring compliance with standards in accordance with section 8 (1)(c) of the Health Act 2007.

Automated vehicle location (AVL): a system that tracks vehicles and provides fixed-time or distance-travelled updates back to a mapping system in the control centre.

Call connect: the time it takes for a 999 and or 112 call to be connected to the ambulance telephony system from the initial point of dialling the number.

Call dispatcher: a member of the control centre staff who is responsible for the dispatch and oversight of an emergency response through the use of information communications technology (ICT) systems in the control room. This staff member must dispatch the most appropriate response to an incident using the details collated by the call-taker and also optimise the ambulance resources in each area.

Call-taker: a member of the control centre staff who is responsible for accurately establishing the patient contact details and address, following a set protocol in order to determine the patient's chief medical complaint. This process generates a dispatch code, which informs the call dispatcher's resource-prioritisation decision-making.

Capability: the application of learning and skills by staff to facilitate change and improvement.

Capacity: the maximum or optimum amount of resources required.

Capacity review: a review to establish the optimum number of emergency vehicles, and the best way to employ that resource to best meet demand.

Clinical practice guidelines: systematically developed clinical protocols used to assist pre-hospital emergency care practitioners to make best practice decisions in the management of specific clinical conditions.

Command and control: command and control is the means by which an ambulance dispatcher recognises what needs to be done and sees to it that appropriate actions are taken.

Competence: the knowledge, skills, abilities, behaviours and expertise sufficient to be able to perform a particular task and activity.

Control centre: the call centre where emergency and other calls are answered and ambulances are dispatched from.

Conveyance rate: the number of incidents responded to by an ambulance that result in the patient being transported to hospital or an alternate healthcare facility rather than being treated over the phone or at the scene.

Corporate governance: the system by which services direct and control their functions in order to achieve organisational objectives, manage their business processes, meet required standards of accountability, integrity and propriety and relate to external stakeholders

DELTA calls: calls reporting life-threatening conditions other than cardiac or respiratory arrest.

Demand analysis: matching resource availability to anticipated demand, based upon trend analysis and the likely impact of upcoming events.

Dynamic deployment: a system whereby ambulances or other emergency ambulance response vehicles are strategically positioned at various predetermined tactical locations away from ambulance stations in a geographic area, in order to most rapidly respond to anticipated demand. This is as opposed to being statically stationed in one place. This process requires the continuous movement of resources over the course of a day or week, in response to the pattern of demand, to ensure that the deployment pattern of remaining available resources are best positioned to best cover the overall possible need for ambulances in an area.

ECHO calls: calls reporting an immediately life-threatening cardiac or respiratory arrest.

EMT: emergency medical technician. This ambulance crew member provides the baseline level of ambulance service pre-hospital emergency care to a patient which includes a wide range of interventions which are fundamental to on-scene emergency care.

FILL mode: a means of retrospectively applying missing time stamps to emergency call records on a computer-aided dispatch system.

First responder: a first responder is defined by the Health Information and Quality Authority as a person who attends a potentially life-threatening emergency who:

- is suitably trained and holds a recognised qualification, as a minimum, in basic life support and the use of a defibrillator
- attends regular refresher courses
- is formally networked with a national ambulance control centre.

Fleet: the ambulance response vehicles used by the National Ambulance Service and ambulance response vehicles used separately by Dublin Fire Brigade and operated as a unit within each of these services.

Focus group: a group of individuals which are selected by researchers to provide an insight into a particular topic, often using personal experiences to inform the area of study undertaken.

Front-loaded model: improved model for quicker call-taking and dispatching processes, which includes ambulance deployment in advance of a dispatch code being generated.

Gazetteer: an accurate geographical system used by the control centre to identify the location of incidents.

Governance: in healthcare, an integration of corporate and clinical governance; the systems, processes and behaviours by which services lead, direct and control their functions in order to achieve their objectives, including the quality and safety of services for patients.

Hear and treat: a system to allow the treatment of conditions through phone advice rather than via ambulance transport to an emergency department by a medic located in the ambulance control centre.

Incident 50379: In 2013, an emergency call was made to the National Ambulance Service. An ambulance was not dispatched to the scene, and following a sequence of additional events, the patient subsequently died. Following this incident, an investigation culminated in a report being published, entitled *The Report of the Investigation of incident 50379*.

Local injuries unit: a locally based service which enables patients to be assessed with minor injuries to avoid waiting times at an emergency department.

Mobile data terminal: a computerised device used in emergency vehicles, such as ambulances to communicate with a control centre via data sent and received

Mobilisation time: the time it takes for an ambulance crew to mobilise to an emergency call.

OMEGA calls: patients with a minor illness or injury.

On-call activation: this is an ambulance crew rostering practice whereby a crew remains available to respond to calls outside of and in addition to their normal working hours, usually from home. On-call activation results in staff mobilisation from home, when the conventionally rostered resources are fully in use, yet there remains a need for further ambulance capacity to respond to a call.

Operational plan: a detailed outline of how an organisation will use its available resources to achieve specific goals over a period of time pertaining to the organisation's strategic plan.

Paramedic: a skilled healthcare practitioner who is trained to provide a significant range of diagnostic and treatment modalities in the emergency setting. Their skills and privileges build on those of the emergency medical technician (EMT) grade.

Patient-carrying vehicle: A patient-carrying vehicle is any vehicle able to transport the patient in a clinically safe manner and dispatched from an ambulance service control room. An example includes a CEN [Comité Européen de Normalisation (Committee for European Standardization)] B compliant double crewed fully equipped ambulance.

Patient handover: the handover of care between the ambulance crew and the hospital nurse.

Patient pathway: the journey a patient experiences from the initial point of contact with the health service, through the process of medical assessment, appropriate care and treatment to the time the patient leaves the healthcare facility.

PHECC: the Pre-Hospital Emergency Care Council (PHECC) is the national body with responsibility for the professional regulation of ambulance personnel and education and training in the area of pre-hospital emergency care in Ireland. It also maintains a statutory register of pre-hospital emergency care practitioners, and facilitates the setting of clinical practice standards through the production of clinical practice guidelines.

Predictive analysis tool: a scientific tool that uses historical data and demographic information to identify in a given area where the next emergency call will be generated from.

ProQA: emergency medical dispatcher software package.

Rapid response vehicle: an RRV is a smaller car- or jeep-type vehicle which carries all of the equipment contained within an emergency ambulance except for the stretcher. It is staffed by one experienced paramedic and attends only emergency calls.

See and treat: the treatment of a patient by paramedics with no further referral to an additional healthcare provider or emergency department.

Sequence of events: a succession of events over time which lead to an outcome.

Service level agreement: a framework for the provision of services, including details of quality and governance requirements.

Service user: this term includes people who use healthcare services (this does not include service providers who use other services on behalf of their patients and service users, such as general practitioners [GPs] commissioning hospital laboratory services); parents, carers, family and potential users of healthcare services.

Strategic plan: a focused guide which outlines future direction for an organisation through the development of targets to achieve strategic goals. It is generally a long-term vision (three to five years) and enables the development of an operational plan.

Tactical deployment plan: a tactical deployment plan is primarily focused on the detailed deployment of resources and contingencies in a given area by time of day and day of week.

TETRA: Terrestrial Trunked Radio. As used in this report, TETRA refers to the National Digital Radio Service in Ireland, a purpose-built secure digital mobile radio network owned and managed by TETRA Ireland in the areas of security, fire and safety, healthcare, Government and public service agencies.

The Authority: the Health Information and Quality Authority

Turnaround time: the measurement of time from the point of an ambulance's arrival to an emergency department, to the point when the patient is physically handed over from the ambulance crew to the care of hospital staff.

Verification time: the time required to determine the caller's telephone number, the nature of the chief complaint, the AMPDS dispatch code and the exact location of the incident by the emergency-call taker in the Ambulance Control Centre.

Executive Summary

Providers of emergency ambulance services are critical public safety organisations. Historically, ambulance services in Ireland have been fragmented, with nine providers working relatively independently until 2005. This fragmentation hindered overall service progression. At that time, the National Ambulance Service was created to merge into one entity the ambulance services provided by eight former health boards. Today, ambulance services in the State are provided by the National Ambulance Service, covering most of Ireland, and Dublin Fire Brigade, covering most parts of Dublin.

Over the past 10 years, much progress has been made with ambulance services nationally. During this time, there has been a considerable expansion of the clinical competency of pre-hospital emergency care practitioners. The increase in the numbers of paramedics and advanced paramedics and the expansion in the treatment options that these healthcare professionals can provide to patients at the first point of contact with the emergency health services has been a major advance for patients. The National Ambulance Service and Dublin Fire Brigade have also played a pivotal role in both the Health Service Executive's (HSE's) Acute Coronary Syndrome and Acute Stroke Clinical Care Programmes.

These improvements have been led by the ambulance service providers, the pre-hospital emergency care practitioners themselves and the Pre-Hospital Emergency Care Council. They deserve great credit in rolling out these improvements for patients. However, despite progress in clinical care capability, other aspects of the services provided to patients have not progressed as well as they could have. In short, many of the legacy issues associated with the fragmented nature of the original nine providers remain, and the National Ambulance Service has struggled to fully integrate these services into one entity.

To overcome this problem, ambulance services in Ireland must continue to undergo significant change. Such change is ongoing, with the National Ambulance Service moving from six ambulance control centres to one national ambulance control centre located over two sites (each acting as a back-up to the other).

Significant change in many other areas, as outlined in this report, will be vital to improve services for patients. To enable this, effective leadership, clear strategic planning and ongoing constructive cooperation between management and staff will be vital to effect the necessary improvements required to best serve patients who rely on the service. Better performance could also be achieved through an ongoing investment in management support and training. Using alternative models of treatment, better pooling and use of existing resources, further development of community first responders, and public engagement on appropriate use of services will also be necessary.

It is possible that the number of emergency ambulances and other response vehicles on the ground may need to be expanded to improve performance. However, throughout this review process, it has become apparent to the Authority that there is also significant scope to improve ambulance services in Ireland within existing current resources. In particular, there is considerable potential for improving ambulance service response times if efforts are directed towards building the operational efficiency of control-centre call handling (including address verification), dispatch and resource mobilisation. In addition, both ambulance service providers could improve response times by:

- better matching of available resource to anticipated demand
- ensuring more tactical deployment of resources away from ambulance or fire stations based on predictive analysis of ambulance need, in what is known as dynamic deployment*
- better ownership of performance amongst staff and managers, and the development of a culture of continuous improvement.

In addition, at the moment, nearly all patients who call for an emergency ambulance and consent to travel to hospital are brought to an Emergency Department. This model of care is not in keeping with international best practice which, when it is safe to do so, now looks to treat patients with certain conditions via telephone consultation; treat patients at the scene and then discharge them; or treat patients at the scene and then refer them to an alternate healthcare provider for follow up care. In some services internationally, in excess of 40% of patients are successfully treated by paramedics without the need to transport patients to hospital. Transporting what is an annually increasing number of patients to the Emergency Department is not sustainable for the two ambulance services or acute hospitals.

Efforts by the National Ambulance Service to explore alternative treatment pathways have been limited to date, and at their current rate of progression will not result in the required level of change needed. Dublin Fire Brigade has likewise not begun to fully explore the potential for use of alternative care pathways. The lack of an overall strategy to support this change to the service model – which encompasses a need for more comprehensive clinical governance structures – was noted as a key barrier to meaningful progress. More effective workforce planning to further increase the clinical capability of the workforce will also be necessary. This progression will through necessity require an increase in advanced paramedic numbers in both services. Both the National Ambulance Service and Dublin Fire Brigade need to more effectively address the potential for alternative

* At the time of the Authority's review, two other parallel reviews of ambulance services in Ireland were also independently underway. Firstly, a capacity review has been commissioned by the Health Service Executive (HSE) to technically determine the most appropriate way to resource ambulance service providers and deploy ambulances across Ireland. In addition, a joint HSE-Dublin City Council review into ambulance service provision in Dublin city and county was ongoing.

patient treatment pathways. In addition, there is also scope in some circumstances for transporting patients to local injuries units rather than Emergency Departments, which may be more appropriate for some patients and ambulance service providers alike.

This review also explored the issue of ambulance delay at the Emergency Department. Currently, critical ambulance capacity is being lost due to delay in handing over patients to the care of the Emergency Department. Delay in turnaround is a complex problem, which results from difficulty in relation to patient flow through the hospital system. Resolution of this problem will require a multifaceted approach, with full engagement from all stakeholder groups. Notwithstanding the complexity of this problem, the National Ambulance Service and the Dublin Fire Brigade could do more to work in partnership with acute hospitals and other key stakeholders to more effectively address what is a critically important issue in terms of making best use of available ambulance capacity.

The public has an important role to play in ensuring that emergency ambulances are used in an appropriate way. Both the National Ambulance Service and Dublin Fire Brigade could do more to engage with service users to gain a better insight into how improvement to services from a patient perspective can be best achieved. Public awareness of and support for the use of alternative care pathways - which differ from the traditional approach of transporting all patients to the ED - will be critical to the success of such initiatives.

In reviewing how ambulance services are provided in Dublin, it was evident to the Authority that services provided by Dublin Fire Brigade and the National Ambulance Service are not integrated. The Authority's Review Team identified poor levels of cooperation between both entities, which was not in the best interest of patients. In particular, poor coordination in ensuring the best use of pooled ambulance and dispatch resources meant that patients did not universally receive a response in as fast a time as would be achievable with better cooperation between them. As a matter of urgency, it is important for both organisations to work together to better coordinate services, and make best use of their collective resources. In addition, the National Ambulance Service must immediately involve the Dublin Fire Brigade in the Ambulance Service's national control centre reconfiguration planning process. This needs to happen to ensure seamless service provision by both providers during the transition period of moving the National Ambulance Service's control centre functions from Dublin City Centre to Tallaght in Co Dublin.

This report outlines some potential opportunities for improvement by the Dublin Fire Brigade in attaining better response times within current resources. Notwithstanding this potential for improvement, the current configuration of resource capacity, deployment and the underlying model of care used is such that the Dublin Fire Brigade regularly do not have enough available capacity to meet demand. In these circumstances, the Fire Brigade ask the National Ambulance Service over the phone for assistance in responding to calls. It should be noted

that neither service has oversight of the other's ambulance resources, and organising assistance over the phone takes valuable time. This can lead to delay in resource deployment and ultimately prolongs response times for patients.

On some days, up to 50% of all emergency calls received by Dublin Fire Brigade may be delayed for various periods of time due to non-availability of a closely located Dublin Fire Brigade resource, or in some cases a lack of availability of any Fire Brigade resources. In 2013, Dublin Fire Brigade requested National Ambulance Service assistance in responding to calls 26,920 times out of a total of 81,432 calls that it received that year. This amounted to just under one-in-three of all calls received. Of these, the National Ambulance Service was in a position to offer assistance for a total of 8,076 calls. The remaining 18,844 calls either received a response from a Dublin Fire Brigade resource mobilised from a relatively long distance away from the incident, or where no resource was available, the call needed to be queued for a period of time until a resource from either service became available to respond to the call. Dublin Fire Brigade explained to the Review Team that it estimates that calls need to be queued until a resource becomes available approximately 14,000 times per annum.

There are also challenges in rural areas serviced by the National Ambulance Service. Staff interviewed highlighted a particular challenge on some occasions in finding the correct locations for calls in rural areas using current systems. The long distances that crews need to travel to patients, coupled with the pattern of one-off housing in rural areas also makes the universal attainment of rapid response times difficult. It is anticipated that the HSE capacity review will explore this in further detail. However, it is of significant concern to the Authority that the well known ambulance 'black spot' areas of Tuam Co Galway, Mulranny Co Mayo and Loughglynn Co Roscommon remain without a dedicated ambulance resource.

Geographical challenges in rural and sparsely populated areas will always present some difficulties for ambulance services in achieving timely and appropriate responses to ECHO* and DELTA** calls. A more comprehensive national programme of community first response schemes located in all rural and sparsely populated areas should be developed. The National Ambulance Service must take steps to effectively lead this progression nationally. Extensive community involvement will also be critical to the successful achievement of a more comprehensive national network of schemes.

It is of significant concern to the Authority that the National Ambulance Service's clinical governance arrangements do not include any clinical audit or assurance processes to ensure patients are receiving the most up-to-date and appropriate care. As a result, the opportunity to improve patient care and outcomes through the methodical review of care against clear criteria is not happening. Though the National Ambulance Service has made recent progress in its ability to effectively

* Patients who are in cardiac or respiratory arrest.

** Patients with life-threatening conditions other than cardiac or respiratory arrest.

investigate serious adverse clinical incidents, more should be done to embed effective clinical and corporate risk management structures and clinical quality assurance mechanisms throughout the Service. The National Ambulance Service needs to review the totality of its approach to risk management.

The Review Team investigated the progress made by the National Ambulance Service in implementing the recommendations from a previous *Report of the investigation of an incident (incident 50379)*, in the seven months between its publication and the outset of this review. This report related to an emergency call made to the National Ambulance Service, where an ambulance was not dispatched to the scene. Following a sequence of additional events, the patient subsequently died in hospital. Some of the recommendations of the subsequent report had been enacted by the National Ambulance Service, including the comprehensive introduction of a more thorough system for dealing with callers who have difficulty with speaking English. However, full implementation of all of the recommendations had not yet occurred. Recommendations not fully in place included the separation of call-taker and dispatcher roles in all ambulance control centres.

At the time of the review, some control centres remained challenged, due to staff shortages, in separating the call-taking and dispatch function as recommended in the enquiry report into incident 50379, published in late 2013. The Authority reviewed staffing levels in control centres throughout the review, and found that on some occasions the staffing levels in some ambulance control centres fell below the required safe levels. This risk was escalated during the review by the Authority to the National Ambulance Service. The Review Team also identified that the National Ambulance Service has failed to maintain recruitment of paramedics at a rate sufficient to replace those staff that leave the service. Declining paramedic numbers has resulted on a reliance on the payment of overtime to staff ambulance rosters, or in some cases the dropping of ambulance shifts. Both immediate and sufficient paramedic recruitment, and more effective ongoing workforce planning is required to address this problem.

There is significant scope for improvement in the information and communication technology systems employed by both services. While this will require investment, both services could also act to make better use of information readily available to them from current systems to progress the quality of care provided. The Authority is also concerned about the ageing profile of the National Ambulance Service's fleet of emergency ambulances. Its fleet programme aims to replace vehicles over seven years old and with mileage greater than 500,000 kilometres. Of its 266 emergency ambulances, at the time of the review 18% (47 vehicles) were eight or more years old. Other ambulances will soon also need replacement. It is the Authority's view that the age of many of the National Ambulance Service's vehicles increases the inherent risk of ambulance breakdown compared to that which might be expected with a younger fleet. Staff repeatedly identified an increase in emergency ambulance breakdowns which they perceived to be due

to a reduction in fleet investment, while senior staff highlighted lack of real-time fleet management information. The National Ambulance Service needs to act to mitigate this risk in the short term.

The Irish health service is undergoing a period of significant change. As the acute hospital service moves towards a model of hospital groups, it is vital that ambulance services are fully included in this strategic planning process. To better enable this, it is imperative that ambulance services operate as a clinical service embedded in the unscheduled care system, under the remit of the Acute Hospitals Directorate of the HSE. This change should be reflected in the strategic planning of both the HSE and emergency ambulance service providers. Furthermore, it is critical that strategic planning from the HSE clearly articulates a vision for the progression of emergency ambulance service in Ireland over the medium- to long-term. The realisation of such a vision will also require more effective leadership and management of the ambulance service at all levels. Better leadership and management will also need to be allied with sustained cooperation from all staff to progress services, in the best interest of the public that they serve.

Given the significant need for, and indeed potential for improvement in ambulance service provision in Ireland, it is vital that the HSE, the National Ambulance Service and the Dublin Fire Brigade use this report as a catalyst for improvement. On foot of this report, both service providers, and the HSE must act to formulate and implement quality improvement plans to ensure improvement in the short, medium and long term. The plans should be detailed, and include timelines for action, and assign accountable persons to each task. Where there are areas of joint responsibility for improvement between the National Ambulance Service and the Dublin Fire Brigade, a collective plan for improvement should be formulated and enacted. These quality improvement plans should also be published so that the public who avail of these services can be informed of how it is intended that improvement will be realised. In addition, over time each plan should be regularly updated to keep the public informed on progress.

Recommendations

Introduction

The recommendations below relate to crucially important aspects of service provision by both organisations. While these recommendations relate to high-level issues in need of action as identified by the review, there are also other recommendations contained within this report which outline areas for further improvement. It is vital that both services act to implement these recommendations as a matter of urgency. It is expected that on foot of these recommendations, both service providers will formulate quality improvement plans to address each specific recommendation, and the other findings of this review. For areas in need of improvement where there is interdependence between both service providers, publication of a joint improvement plan will be necessary.

The first recommendations listed below are of national significance, and are of importance to the Health Service Executive (HSE), the National Ambulance Service and Dublin Fire Brigade. The remaining four recommendations are specific to the National Ambulance Service and the HSE.

Both the National Ambulance Service and Dublin Fire Brigade should make each improvement plan available for the public to view on each of their websites. In addition, progress in relation to the implementation of each quality improvement plan should be regularly updated on each website, to assure the public that progress is being achieved in addressing the issues identified by this review.

National recommendations

The following recommendations relate to the provision of emergency ambulance services nationally, by the National Ambulance Service and Dublin Fire Brigade. As a result, both service providers must address these as individual entities, and collectively where necessary.

Recommendation 1

Both the National Ambulance Service and Dublin Fire Brigade must address the operational inefficiencies identified within this report and publish a joint action plan outlining proposed steps to improve individual and collective performance in call-handling, address verification, dispatch, ambulance deployment, mobilisation, navigation and the coordination of calls between both services.

Recommendation 2

State-funded emergency ambulance services should be operated as a clinical service embedded in the unscheduled care system, under the remit of the Acute Hospitals Directorate of the Health Service Executive (HSE), and a key part of the wider reform of hospital health service provision. This should be reflected in the strategic plans of the HSE and ambulance services.

Recommendation 3

As a matter of urgency, both the National Ambulance Service and Dublin Fire Brigade must put the necessary corporate and clinical governance arrangements in place to provide a fully integrated ambulance service in the greater Dublin area. This should include a binding service level agreement, which includes formal quality and performance assurance reporting mechanisms.

Recommendation 4

The Health Service Executive and National Ambulance Service must immediately involve Dublin Fire Brigade in the National Ambulance Service Control Centre Reconfiguration Project to ensure a seamless and safe transition of services in Dublin.

Recommendation 5

The strategic direction of emergency ambulance service provision needs to be clearly articulated by the Health Service Executive, to include both the National Ambulance Service and Dublin Fire Brigade. In addition, both ambulance service providers must now review the current model of care provided which requires 100% transporting of patients to hospital emergency department in all cases. In the interim, both services should act to implement 'hear and treat' and direct access to alternative care pathways, to include local injuries units in smaller hospitals, where appropriate.

Recommendation 6

A comprehensive workforce plan should be devised and implemented to deliver an upskilled and modernised emergency response workforce, enabling greater levels of professional autonomy and clinical decision-making.

Recommendation 7

Both the National Ambulance Service and Dublin Fire Brigade must continue to enhance their approach to the collective monitoring of service performance through the ongoing development of an accurate and balanced system of measurement and public reporting against both clinical, response time and other key performance indicators for pre-hospital emergency care.

This suite of measures should include the 7 minute 59 second first-response time for all ECHO and DELTA calls (patients who are in cardiac or respiratory arrest; and patients with life-threatening conditions other than cardiac or respiratory arrest) to include specific response times for cardiac arrest, stroke and heart attack, alongside measurement of ambulance turnaround times at hospitals. Response time targets should differentiate between urban, rural and combined response results, with the aim of driving incremental improvement in each setting.

Recommendation 8

Both the National Ambulance Service and Dublin Fire Brigade must develop and implement an ongoing community education programme promoting appropriate use of ambulances. Such public education should seek to reduce unnecessary requests for ambulances, and improve public awareness of the clinical skills and competencies that pre-hospital emergency care practitioners possess. Public awareness of, and support for alternate care pathways will be critical to their successful application.

Recommendations specifically related to the National Ambulance Service and the Health Service Executive (HSE)

The following recommendations specifically relate to the emergency ambulance service provided by the National Ambulance Service.

Recommendation 9

The National Ambulance Service needs to more effectively support managers at all levels. To enable this, the National Ambulance Service should undertake:

- a review of all job descriptions for executive, management and supervisory positions to ensure that key accountabilities and management competencies are properly articulated against business requirements
- an assessment of current management capabilities against revised job descriptions
- the provision of routine and ongoing training in a number of core areas for managers, to include: financial management, human resource management, performance management, quality improvement and information management.

Recommendation 10

To achieve timely and appropriate response to ECHO calls (patients who are in cardiac or respiratory arrest), the National Ambulance Service must as a priority actively promote the development of a comprehensive national programme of community first-response schemes in all rural and sparsely populated areas. The successful further development of these schemes will also require a significant increase in local volunteerism.

Recommendation 11

The National Ambulance Service must review the totality of its approach to both corporate and clinical risk management, to enable it to effectively determine and manage risk at all levels of the organisation. This requires the full cooperation of all National Ambulance Service personnel.

Recommendation 12

The National Ambulance Service must act to further enhance clinical governance capability, to include both the setting of standards and improved assurance. The National Ambulance Service must commence clinical audit, to allow it to be able to assure itself that the standard of clinical performance provided to the public is timely, effective and safe. This needs to begin now, and need not be delayed by the current lack of an electronic method of recording data. To facilitate clinical audit, it is recommended that the National Ambulance Service publically advertise and appoint a clinical quality lead at a senior level, reporting to the Medical Director of the National Ambulance Service.

Chapter 1 - Introduction

This report presents the findings from a review of public pre-hospital emergency care services that has been undertaken by the Health Information and Quality Authority (the Authority). This review was carried out in order to monitor progress with the implementation of the Authority's *National Standards for Safer Better Healthcare*⁽²⁾ (referred to subsequently in this report as the Safer Better Healthcare Standards). It was the intention of the Authority to undertake a review of pre-hospital emergency care as part of a planned assurance programme for 2014. However, in light of persistent public concerns around poor ambulance response times, this review process was brought forward at the request of the Minister for Health, to commence in March 2014.

In undertaking this review, the Authority used the National Standards to identify specific features that should be in place in pre-hospital emergency care services to achieve safe, high quality services. The proposed methodology for the review was published on the Authority's website, www.hiqa.ie in the form of a guide on 17 April 2014. This guide outlined the specific features selected for review in determining the quality and safety of services provided by publicly-funded pre-hospital emergency care services. Further details in relation to the methodology used by the Authority in undertaking this review are outlined in Appendix A. This is the first time that public pre-hospital emergency care services have been reviewed against the National Standards.

The review was carried out in accordance with section 8(1)(c) and other relevant provisions set out in the Health Act 2007. It was conducted by a team that was appointed and authorised by the Authority in accordance with section 9 of the Health Act. This provided the Review Team with the following rights:

- entry
- to inspection of premises, records and or documents
- carrying out of interviews
- requiring explanations in relation to documents, records or other information.

In addition, the Authority, in accordance with the Health Act 2007, engaged external advisors as it considered necessary in the undertaking of this review. Details of these advisors are set out in the biographies at the end of this report.

At the start of the review, an initial meeting was held between the Authority and representatives from the National Ambulance Service, including the Director of the National Ambulance Service, on 31 March 2014 in order to discuss the review process. Regular engagement between the Authority and National Ambulance Service followed throughout the review regarding the issuing of document and data requests, staff interviews and on-site visits.

The Authority also extended its review of pre-hospital emergency care services to the ambulance service provided in Dublin City and County with the cooperation of Dublin Fire Brigade. The Authority held a meeting with representatives from Dublin Fire Brigade, which also involved the Chief Fire Officer, on 10 June 2014 to discuss the review.

Background to the review

Pre-hospital emergency care is the emergency care provided to a patient before transfer to a hospital or appropriate healthcare facility. Pre-hospital emergency care needs to be clinically safe, responsive and should deliver high-quality outcomes for patients in this care setting. It depends upon the most appropriately trained person or persons with the necessary resources attending the emergency incident within an acceptable time frame. These people must then carry out high-quality care in the assessment, diagnosis and clinical management of the patient in line with international best practice. Finally, once this immediate care has been administered, the patient needs to be safely transported to the most appropriate care setting based upon the clinical assessment of their needs.

In Ireland, pre-hospital emergency care is provided by the Health Service Executive's (HSE's) National Ambulance Service, with the exception of Dublin City and County which are served by both National Ambulance Service and Dublin Fire Brigade. In addition to the services provided by National Ambulance Service and Dublin Fire Brigade, pre-hospital emergency care services also encompass aeromedical services in accordance with service level agreements with the Irish Defence Forces and the Irish Coast Guard.

The National Ambulance Service consists of over 1,600 staff. This complement includes control staff, emergency medical technicians, paramedics and advanced paramedics. Dublin Fire Brigade is comprised of over 764 dual firefighter-paramedics, inclusive of 36 firefighters who are also trained to advanced paramedic level.

The Pre-Hospital Emergency Care Council (PHECC)⁽³⁾ is the national body with responsibility for the professional regulation of ambulance personnel and education and training in the area of pre-hospital emergency care in Ireland. It also maintains a statutory register of pre-hospital emergency care practitioners, and facilitates the setting of clinical practice standards through the production of clinical practice guidelines.

In addition to the National Ambulance Service, Dublin Fire Brigade provides a pre-hospital emergency ambulance service to Dublin City and County which operates under a 2012 memorandum of funding with the HSE under Section 38 and 39 of the Health Act 2007. This funding arrangement was outlined by the HSE at the beginning of the review following a formal request by the Authority. Also, throughout this review, the Authority were conscious of the fact that an external review of Dublin Fire Brigade was also being conducted.

Therefore, the primary elements of that particular section of the Authority's pre-hospital emergency care review focused on leadership, governance and service performance.

Review objectives

The review intended to identify if pre-hospital emergency care services in Ireland have the necessary elements in place to ensure high-quality performance in the assessment, diagnosis, initial and ongoing clinical management and transporting of acutely ill patients to appropriate healthcare facilities.

The review's lines of enquiry are outlined in the *Guide: Review of pre-hospital emergency care services to ensure high quality in the assessment, diagnosis, clinical management and transporting of acutely ill patients to appropriate healthcare facilities*⁽⁴⁾, which is published on the Authority's website. The lines of enquiry focused on determining if the following elements are in place and are operationally embedded:

- the National Ambulance Service and Dublin Fire Brigade have clear accountability and governance arrangements, including clearly defined schemes of delegation, to ensure the delivery of high quality, safe, effective and reliable care
- that there is a clear strategic direction for both services, with implementation plans and control measures
- the provision of care ensures timely response and access to an appropriate healthcare facility based on service users' assessed needs
- the National Ambulance Service and Dublin Fire Brigade effectively identify, manage, respond to and report on patient safety incidents and risks
- that the workforce is well organised and that employees at all levels of the organisation are supported to maintain and enhance their skills and competencies
- that the National Ambulance Service and Dublin Fire Brigade effectively use information as a resource in the planning, delivery, audit, management and improvement of the quality, safety and reliability of the services provided.

Throughout the process of the review, it became evident that both ambulance services are currently facing significant challenges. In particular, they must cope with increasing demand for health and social care services, a growing population with a diverse range of needs, increasing costs of technology and healthcare, in addition to a challenging financial profile.

In addition, the National Ambulance Service is also experiencing significant reform and is currently undergoing a process of modernisation and development with objectives which include:

- a significant National Ambulance Service Control Centre Reconfiguration Project, inclusive of:
 - continuing to reduce the number of ambulance control centres from six to two centres nationally
 - the introduction and roll out across the National Ambulance Service of the TETRA National Digital Radio system
 - investment in information technology and other infrastructure in the National Ambulance Service.

The ongoing change in this Service was taken into account by the Review Team in undertaking this review. Indeed, the Service's approach to this change informed the Review Team's evaluation of service provision as the review progressed.

This report is structured in a number of parts. Chapters 2 – 6 outline the Review Team's findings in relation to the National Ambulance Service under the themes of Leadership, Governance and Management; Clinical Governance; Workforce; Information Systems and Fleet; and Quality Monitoring and Performance.

Chapters 7 – 9 outline findings in relation to Dublin Fire Brigade under the theme headings of; Leadership, Governance and Management; Clinical Governance and Quality Monitoring and Performance. The report then progresses to conclusions related to both services, in Chapter 10.

National Ambulance Service findings

Chapter 2 – Leadership, governance and management

Introduction

The *National Standards for Safer Better Healthcare* (referred to in this report as the Safer Better Healthcare Standards) outline what high-quality and safe healthcare should look like. In the context of this review, the Authority identifies the following attributes as being essential for the delivery of pre-hospital emergency care services in Ireland.

- There is clarity about who is responsible and accountable for the quality and safety of pre-hospital emergency care services.
- Service users requiring acute emergency care have access to the right care and support at the right time.
- Pre-hospital emergency care staff are recruited, organised, developed and supported so that they have the skills, competencies and knowledge to enable the delivery of high-quality, safe and reliable care.
- Pre-hospital emergency care services are designed for reliability – minimising inconsistency, variation in provision and the likelihood of things going wrong.
- Pre-hospital emergency care services are based on:
 - good evidence of what works best
 - striving for excellence through strong strategic planning and implementation
 - monitoring how the service performs
 - making the necessary changes to improve.
- Pre-hospital emergency care uses accurate and timely information to monitor the effectiveness of the service and to promote and encourage improvement.
- Pre-hospital-emergency-care communications processes ensure the community understands the organisation's mission, purpose and medical transportation services available.

The dimensions of quality that service users should receive are described in the Safer Better Healthcare Standards and include effective, safe and person-centred care.

The ability of pre-hospital emergency care to achieve these dimensions of quality in a complex environment is dependent on the capacity⁽⁵⁾ (the overall ability of the organisation to actually perform the responsibilities) and the capability (the inherent competencies within the organisation and their potential to develop, improve and adapt to new constraints and demands)⁽⁶⁾ in four critically important areas:

- Leadership, governance and management – the arrangements put in place by the pre-hospital emergency care services for clear accountability, decision-making, risk management, quality assurance as well as meeting their strategic, statutory and financial obligations.
- Workforce – planning, recruiting, managing and organising a workforce with the necessary numbers, skills and competencies.
- Use of resources – using resources effectively and efficiently to deliver best outcomes for service users.
- Use of information – actively using information as a resource for planning, delivering, monitoring, managing and improving care.

Findings

In reviewing the capacity and capability of the National Ambulance Service (the Service) to effectively deliver pre-hospital emergency care services to ensure the timely assessment, diagnosis, initial management and transporting of an acutely ill patient to an appropriate healthcare facility, the Authority acknowledges that significant governance and operational changes have occurred in the Ambulance Service in recent years which include:

- ongoing enhancement of the clinical governance structure with the appointment of a Medical Director in 2011, and a part-time Deputy Medical Director also appointed in the same year
- centralising the support services which include financial management, procurement, human resource management and fleet procurement within the Leadership Team
- reducing the number of ambulance control centres from 11 to 6 through the National Ambulance Service Control Centre Reconfiguration Project, with further plans to reduce the number of control centres to two centres by 2015.
- improving information communication technology (ICT) to include implementing digital radio, with plans to move to a single national computer-aided dispatch system
- incrementally implementing changes in the staff roster system which includes eliminating on-call arrangements from duty rosters by 2015
- introducing an intermediate care service (ICS) nationally.

Throughout this review process, the National Ambulance Service continued to implement its planned strategies and work toward completing the National Ambulance Service Control Centre Reconfiguration Project.

In addition, at the onset of this review by the Authority, the Health Service Executive (HSE) had commissioned a capacity review of the National Ambulance Service, which is the first time such an exercise has been undertaken. The aim of this review is to independently assess the required resources and the best way of deploying those resources in order to meet the needs of the ambulance service. This capacity review will also include the capacity of Dublin Fire Brigade to provide pre-hospital emergency care as part of the national profile of ambulance service provision. The HSE expects the findings of this review to be finalised in December 2014.

As highlighted in the introduction of this report, both the HSE and Dublin City Council have the statutory powers to deliver ambulance services in Dublin. This arrangement was further reinforced by a European Court judgment in 2007. Dublin Fire Brigade is governed by Dublin City Council. At the time of this review by the Authority, pre-hospital emergency care services in Dublin were distributed between Dublin Fire Brigade and the National Ambulance Service in defined geographical areas of primary response, and as laid out in the Report of the Review Group on the Ambulance Services (1993)⁽⁷⁾. In addition, Dublin Fire Brigade processes all emergency calls (called AS1 calls) for the Dublin area with the exception of Dún Laoghaire. The provision of funding from the HSE to Dublin City Council is a long-standing arrangement, but there has been no formal governance structure or framework governing this relationship. In 2012, the National Ambulance Service implemented a memorandum of funding with Dublin City Council.

The Authority wrote to the HSE on 7 April 2014 seeking clarification on the statutory basis for the funding mechanism provided by the HSE to Dublin Fire Brigade. The HSE responded that it recognised that the legacy arrangement in place with Dublin Fire Brigade was not adequate. As a result, the HSE in conjunction with Dublin City Council had commissioned a joint review of all aspects of the ambulance services operated by Dublin Fire Brigade in the Dublin City and County areas. At the time of preparing this Authority report, this joint review was expected to be finalised in December 2014.

The following sections of this chapter will outline, at the time of the Authority's review, the various elements in place in the National Ambulance Service up until October 2014 to effectively deliver pre-hospital emergency care services to ensure the timely assessment, diagnosis, initial management and transporting of an acutely ill patient to an appropriate healthcare facility.

These elements include the:

- corporate, leadership and operational management structure
- corporate and clinical governance arrangements
- aligned strategic planning and organisational performance arrangements.

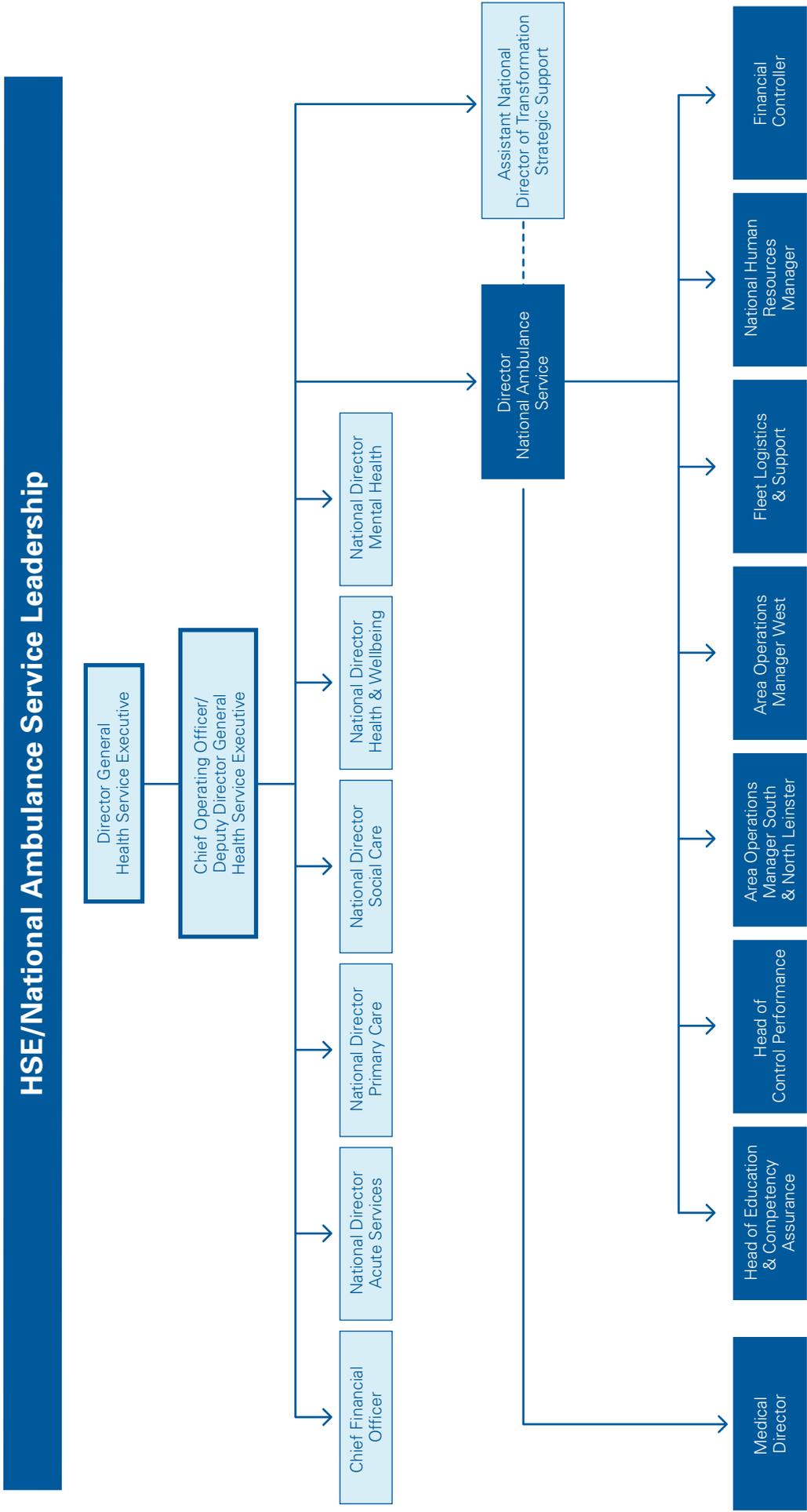
Organisational structure

Corporate and executive

The Director of the National Ambulance Service reports directly to the HSE's Chief Operating Officer, who is also Deputy Director General of the HSE and who has overall accountability for the National Ambulance Service within the HSE (see Figure 1). The National Ambulance Service has three regional operational areas: North Leinster, South and West. The Service's Leadership Team is made up of a medical director, area operations managers, a head of education and competency assurance, a head of control and performance, a fleet, logistics and support manager, a human resource (HR) manager, and a financial controller. In addition, at the start of the Authority's review, the team also included an assistant national director of transformation and support, who had been recently assigned to assist the National Ambulance Service by the HSE Chief Operating Officer.

The Leadership Team reported that their role is to strategically plan and manage the service and provide overall leadership for the National Ambulance Service.

Figure 1. Governance structure for the National Ambulance Service*



* Source: National Ambulance Service.

Operational structures in the National Ambulance Service

The National Ambulance Service management team explained that there are three regional operational areas; North Leinster, South and West (see Figure 2). There are two area operations managers, one of which is responsible for the western area and the other responsible for the north Leinster and southern areas. They reported at interview that they were both members of the Leadership Team, reported to the Director of the National Ambulance Service and are responsible for the operational management of the service in their respective areas. Each area also has an operations support and resilience manager, and a fleet, logistics and estate manager.

The next tiers of senior management within the National Ambulance Service are called operations performance managers. There are eight operations performance managers in total, one of whom is responsible for dealing with public relations and who reports directly to the Director of the National Ambulance Service.

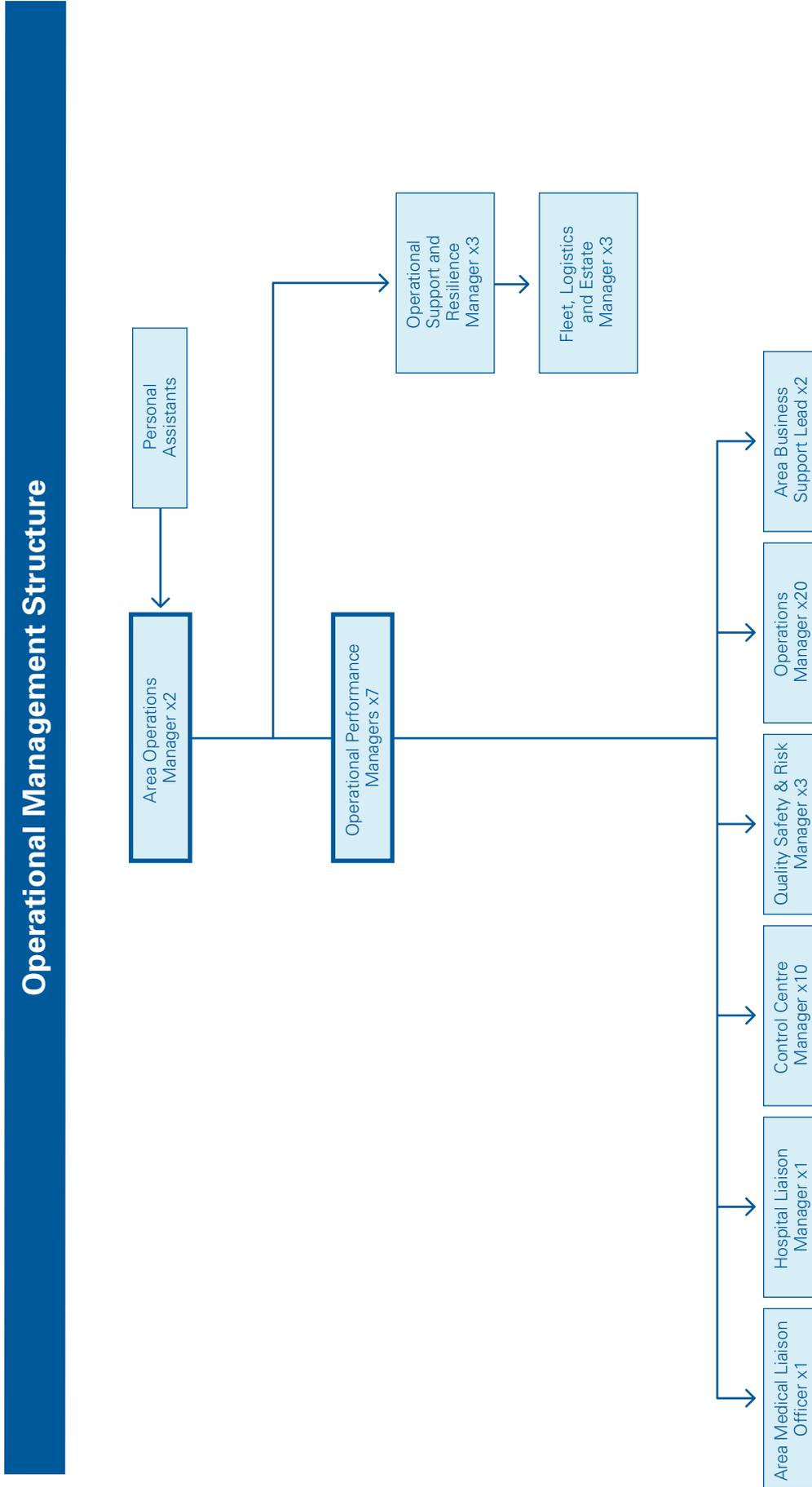
Of the remaining seven, one is responsible for the six control rooms reporting directly to the Area Operations Manager for the north Leinster and southern areas. The remaining six operations performance managers have operational management responsibility for smaller defined geographical areas, with three reporting to the Area Operations Manager for the north Leinster and southern areas, and three reporting to the Area Operations Manager for the western area.

The next tier of management is the operations resource manager. There are 20 operations resource managers in total, who have responsibility for resource management within a smaller geographical area, typically managing three stations. They report directly to the operations performance managers for their area. Control centres have the following grades of staff: manager, supervisor, call-takers and call-dispatchers.

The National Ambulance Service also has paramedic supervisors who are station-based. They work as part of the roster of crews but have additional responsibilities for station management and administrative duties such as ordering medication and supplies. The Service has three professional grades: emergency medical technicians (EMTs), paramedics and advanced paramedics.

The National Ambulance Service also has a hospital liaison officer whose role is to act as a point of contact between the service and hospitals, in the management of issues of collective concern. He reports directly to the operations performance manager with responsibility for control centres.

Figure 2. Operational management structure in the National Ambulance Service*



* Source: National Ambulance Service.

Leadership, governance and management in the National Ambulance Service

Corporate governance

Since May 2012, the HSE's Chief Operating Officer/Deputy Director General has had overall corporate HSE accountability for the delivery of a safe, high-quality national ambulance service. The post-holder reports directly to the Director General of the HSE and provides assurance on the quality and safety of the National Ambulance Service to the HSE Senior Leadership Team. In addition to this role, this person also deputises for the Director General of the HSE and is a member of the Health Service Directorate with corporate responsibility for a range of functions including Health Service Governance and Accountability, Compliance, Commissioning, Corporate and Service Planning, and Performance and Business Information. The Director of the National Ambulance Service reports directly to the Chief Operating Officer/Deputy Director General.

Staff explained to the Review Team that it had been agreed at corporate level that the HSE'S Chief Operating Officer/Deputy Director General would remain responsible for ambulance services while the National Ambulance Service Control Centre Reconfiguration Project was underway. It was further explained that ultimately the National Ambulance Service would be integrated within the National Acute Services Directorate. Notwithstanding these plans at the time of this review, corporate accountability for the delivery of the National Ambulance Service remains with the Chief Operating Officer/Deputy Director General.

Strategic vision, planning and direction

A modern ambulance service should be:

- handling calls over the phone by providing clinical advice to callers (known as **'hear and treat'**)^(8;9)
- treating patients at the scene in a way that meets all of their emergency medical needs (**'treat and discharge'**)⁽¹⁰⁻¹²⁾
- providing immediate treatment on scene, and then referring the patient for ongoing follow-up with healthcare providers other than the emergency department (ED) of a hospital (known as **'treat and refer'**)⁽¹³⁻¹⁶⁾ and
- taking patients – dependant on their clinical presentation – to a wider range of care destinations to include, for example, a local injuries unit or an appropriately resourced primary care centre⁽¹⁷⁻¹⁹⁾

At the time of this review, the Chief Operating Officer/Deputy Director General and the Director of the National Ambulance Service are responsible for the strategic direction of National Ambulance Service and have developed a draft National Ambulance Service Strategy 2014–2016 including a timeline for implementation.

In preparing the strategy, it was reported at interview that the National Ambulance Service team had involved the HSE National Clinical Care Programme Directorate and the wider HSE leadership team in its design.

As already identified, at the time of the review, the HSE had commissioned the capacity review and in conjunction with the Dublin City Council a separate joint review of all aspects of the ambulance services operated by Dublin Fire Brigade. While the Authority recognised the importance of these reviews, it would be a concern if the conclusions and recommendations of both are only based on the configuration of acute health services at the time of this review and aligned to the model of pre-hospital emergency service in place at that time. This model determines that an emergency vehicle (ambulances, emergency response cars and officer cars) is dispatched to all calls, without examining the potential for treatment or triage over the phone. In addition, following arrival on scene, unless the patient refuses to be transferred to hospital, the vast majority of patients are automatically transferred to hospital emergency departments (EDs). This model of care does not consider the potential for the transportation of the patient for treatment to an alternate, non-ED setting that may be more suitable to meet their needs, or indeed the possibility of treatment and discharge by the ambulance crew themselves on the scene.

The draft National Ambulance Strategy 2014–2016 includes four high-level strategic goals around improving the efficiency and effectiveness of the services over a three-year period. The strategic vision for the service over the next three years was explored at interview with key members of the corporate and leadership teams. Senior staff highlighted the significant dependency on both the findings of the pre-hospital emergency care capacity review and the separate Dublin Fire Brigade review to finalise the strategy. Interviewees emphasised their strategic focus as improving on current performance and delivering the National Ambulance Service Control Centre Reconfiguration Project.

However, during interviews with senior staff – which explored the model of service delivery in place at the time of this review, and its potential strategic direction – there appeared to be a reluctance to comprehensively redefine the service model, beyond a limited assessment of ‘treat and refer’ following the start of a very recent pilot programme in one geographic area. Senior staff explained that these reservations stemmed from their perception of the current general level of staff training and competence, lack of protocols and lack of clinical audit in place at the time of this review. These are all the more reason for having an aligned and focused service-model strategy. National Ambulance Service staff highlighted a pilot programme (treat and discharge) that was underway in the southeast of the country. In Chapter 3 of this report, the Review Team explores the status of this treat and discharge pilot programme.

The Review Team examined both the draft strategy and its implementation plan. While it was adjudged to be a good plan, the document was an interim strategy, being unable to consider the outcomes of the two reviews of the services underway at the time of this Authority review. It was notable that the strategic plan did not appear to grasp the impact of wider organisational and health system reform. Nor did it explore how pre-hospital emergency care would dovetail into any proposed new models of care provision, notwithstanding some recent good work that has been done in facilitating better treatment of heart attack and stroke. For example, there appeared to be under-emphasis of the potential impact of the emerging hospital group and hospital trust structures, as outlined in the report; *The Establishment of Hospital Groups as a Transition to Independent Hospitals Trusts*⁽²⁰⁾, which was published in February 2013. Implementation of this report will change the current configuration of all health services to include pre-hospital emergency services. At interview and through review of documentation received from the National Ambulance Service, there was little evidence to suggest that the wider aspects of healthcare provision and modelling were being strategically planned and or discussed at leadership level.

It is apparent that the implementation of the National Ambulance Service Control Centre Reconfiguration Project is the priority focus at corporate and Leadership Team level within the Service. Outside of this significant initiative it was difficult to establish substantial priorities. This was because most timelines for implementing other projects cited in the plan extended from one to three years, with little supporting detail being provided either at interview or in the documentation submitted by the National Ambulance Service to the Authority.

Pre-hospital emergency care services provided by Dublin Fire Brigade are only addressed in the draft National Ambulance Strategy 2014–2016 in a very limited way, and mainly in the context of an ongoing third party review. The lack of detail relating to the service provided by Dublin Fire Brigade in this document is of concern to the Review Team. Given the scale of the operation and the population covered by ambulance services provided by Dublin Fire Brigade, the need for good integration between both service providers is paramount. Good cooperation and integration is especially important at this time, in light of the reconfiguration of control centres being undertaken by the National Ambulance Service. The limited mention of the Dublin Fire Brigade in the draft strategy document, and indeed the omission of mention of the potential impact of National Ambulance Service control centre reconfiguration may have on the integration with services provided by the Dublin Fire Brigade in the strategy represents a serious flaw in the document.

However, at the time of this review, it was reported by senior staff that this draft strategy remains in draft format pending publication of both the HSE's capacity review of the National Ambulance Service and the review of the Dublin Fire Brigade ambulance service.

Governance of the National Ambulance Service Control Centre Reconfiguration Project

Throughout the Authority's review, the National Ambulance Service reiterated the critical importance of successfully implementing the National Ambulance Service Control Centre Reconfiguration Project (referred to here as the project). This, it believed, would transform the delivery of pre-hospital care services in Ireland to ensure efficient national coordination of services and to improve information technology systems. The project aims to establish a single National Emergency Control Centre operating on two sites in Tallaght, Co Dublin and Ballyshannon, Co Donegal. The centre will operate across two sites in order to provide a failsafe backup in the event of one site becoming inoperable. The objective is to improve inter-connectivity within the ambulance service on a national basis in order to improve response and dispatch times, thereby ultimately improving patient services.

The Authority reviewed the governance arrangements in place in the National Ambulance Service to deliver this priority project. At interview, the Chief Operating Officer/Deputy Director General of the HSE was identified as the project sponsor for the National Ambulance Service Control Centre Reconfiguration Project. The project has:

- an information communications technology element which includes the tendering for a single computer-aided dispatch system
- a construction element which includes a new control centre in Tallaght and the refurbishment of the Ballyshannon centre
- a workforce element which includes training and redeployment of staff to the new control centres.

The project also involves the wind down of five existing control centres. It is estimated that completion of the project will cost in the region of €26 million.

A strategic group which is chaired by the Chief Operating Officer/Deputy Director General was established in April 2013 to oversee this project. The group includes the National Director of Human Resources, National Director of Shared Services, Director of the National Ambulance Service and Managing Director of Association of Ambulance Chief Executives (UK). In addition, given the scale and the competencies required to deliver this project, the Chief Operating Officer/Deputy Director General in October 2013 appointed an Assistant National Director of Transformation and Support to support the planning and organisation of this major project. The post-holder is a member of the National Ambulance Service leadership, directly accountable to the Chief Operating Officer/Deputy Director General with an operational reporting line to the Director of the National Ambulance Service. In addition, a Programme Board chaired by the Assistant National Director of Transformation and Support was set up to review project progress, sign off on costs and review and authorise spending. This Programme Board also has input from external expertise.

A Project Board which is chaired by the Head of Control and Performance is in place to oversee the computer-aided dispatch system tendering and implementation process.

The Authority reviewed a large volume of documentation and concluded that the project was well governed at a corporate and leadership level. The documentation included project initiation details, project management governance arrangements, options appraisal processes, minutes of meetings and risk assessments with particular emphasis on human resources, facilities and information technology. However, it is of significant concern to the Authority that during this review, the Assistant Director of Reconfiguration and Transformation – a critical member of the project team – had been reassigned to other duties. As of October 2014, it was explained to the Authority this crucial leadership post had not been replaced.

Managing the change process

The Authority recognises that the planning phase, defined governance arrangements, and committed leadership are in place in the National Ambulance Service to deliver this project. However, the Authority believes that meeting milestones is not the primary determinant of the success of the Service's Control Centre Reconfiguration Project – successful change also involves ensuring employees' capacity to adapt to and work effectively and efficiently in the new environment.

Fundamentally, it is people who make change happen – nothing moves forward without engaged motivated stakeholders. In this case, the main stakeholders are the employees within the services, the general public, general practitioners (GPs) and hospital staff who use the service. Even when the change is essential and non-negotiable, as in this case, cooperation and collaboration to achieve this mammoth change within the Service is more likely if stakeholders are involved and kept informed.

One of the most challenging and demanding aspects of any change project is communication. Communication is the main way that people are engaged in the change. Introducing successful change relies heavily on how the participants in the change view it – ineffective communication and stakeholder engagement can disrupt any change project⁽²¹⁾. The Authority's findings in relation to the effectiveness of these communication systems and employee engagement in the change process will be reported throughout this review report.

National Ambulance Service corporate governance

The Review Team reviewed the annual Operational Plan which sets out the National Ambulance Service's actions for 2014. These actions are prioritised on improving ambulance response times, implementing the National Ambulance Service Control Centre Reconfiguration Project and increasing the dynamic deployment of resources.

The specific actions in relation to quality and patient safety include developing clinical outcome indicators, introducing systemic clinical audit of patient records and supporting the continuing professional competence of all staff within the National Ambulance Service. In addition, there are performance indicators with targets set for emergency response times by an emergency response vehicle (such as ambulances, emergency response cars and officer cars) for ECHO* and DELTA** call of 18 minutes 59 seconds in 95% of calls. There are also performance indicators and targets set for clinical outcomes for out-of-hospital cardiac arrest and targets relating to finance and human resources.

While the Authority acknowledges the existence of such a plan, some actions, in particular around quality and safety, are lacking detail. For example, the introduction of systemic clinical audit of patient care records is identified as a key priority in one section of the operational plan but not subsequently reflected in any reciprocal implementation plan. This was explored with staff, who highlighted that the National Ambulance Service's priority was to now instigate a project to introduce electronic patient records to enable rigorous audit. However, in the interim and in the absence of an electronic record, there was no evidence that a systemic or indeed a reduced targeted audit of existing patient records was planned to assure the standard of care.

When looking at senior reporting relationships, the Review Team found that there was an arrangement whereby the Chief Operating Officer/Deputy Director General spoke on operational issues on a daily basis with the Director of the National Ambulance Service. In addition there is also a formal one-to-one monthly meeting with the Director where a monthly assurance report is discussed. Furthermore, there is a quarterly meeting between the Chief Operating Officer/Deputy Director General and the National Ambulance Service Leadership Team.

The formal one-to-one meetings between the Chief Operating Officer/Deputy Director General and Director of the National Ambulance Service generate an action log which details the priority, responsible party and status of actions. Actions varied from developing a risk register, to responses to industrial relation issues and parliamentary questions. As explained by those interviewed, at the time of the Authority's review, the National Ambulance Service was under extreme pressure to provide data and information in response to the media coverage of its services. As a consequence, at the time of this review, discussions and resultant actions tended to be reactive in response to media coverage, parliamentary queries and localised operational issues, with limited evidence of a strategic focus on the delivery of the service.

A monthly assurance report is prepared by the Director of the National Ambulance Service which details the performance of the service against the Service's Operational Plan.

* Patients who are in cardiac or respiratory arrest.

** Patients with life-threatening conditions other than cardiac or respiratory arrest.

It was reported at interview that this is discussed with the Chief Operating Officer/ Deputy Director General at their monthly meetings. This report covers financial management, staff attendance and absenteeism, performance improvement, quality and safety initiatives and the implementation of the National Ambulance Service Control Centre Reconfiguration Project.

The assurance report details in particular the Service's performance against the 18-minute-59-seconds key performance indicator (a specific and measurable element of practice that can be used to assess the quality of care) for ECHO and DELTA calls and ambulance turnaround times at hospital emergency departments. While the monthly assurance report is a positive development, there was little evidence of the inclusion of performance indicators specifically focusing on the quality and safety of the service such as service-user complaint trending, serious incidents, adverse incidents, clinical standards, clinical outcomes and clinical effectiveness.

The Authority further explored this aspect with senior staff. For example, it was explained to the Review Team that using a corporate risk register was a relatively new development within the organisation, with risk management arrangements being described as rudimentary by those interviewed. From documents submitted to the Authority, it was evident that the Chief Operating Officer/Deputy Director General recognised this as an issue and as a result, in April 2014, facilitated training for the Leadership Team. This was with the ultimate aim of developing a system for corporate risk management within the organisation. At the time of this review, it was too early for the Authority to specifically assess either the effectiveness of this leadership training programme or how the aligned learning demonstrated improved risk-management governance arrangements within the National Ambulance Service.

In relation to the quarterly meeting between the Chief Operating Officer/Deputy Director General and the Leadership Team, these meetings were reported as being a recent development, the first meeting having been held in April 2014. Therefore, the Authority was unable to assess the format or efficacy of these meetings. However, staff reported that the 18-minute-59-second patient-carrying vehicle response time target is an important item discussed.

The Review Team requested documentation to reflect the governance interface between senior leadership figures in the HSE and National Ambulance Service, and Dublin Fire Brigade. While there was evidence provided which outlined the occurrence of meetings, it was identified by the Review Team that little action resulted from these meetings. This was best illustrated by the ongoing failure by both parties to establish a joint dispatch desk in the Townsend street control centre which they both share, despite this being a regular issue for discussion.

Executive governance

An appropriately qualified and effective leadership management team ensures that an organisation fulfils its operational functions aligned to its strategic direction by planning, controlling and organising the service to achieve its outcome in the short, medium and long term.

To ensure this happens in the National Ambulance Service, the Service has a duty to have formalised governance arrangements with clear lines of delegated accountability in place, with responsibility at every level. This would ensure that everyone is aware of their respective role and responsibilities. In doing so, the National Ambulance Service reported that it is supported in the area of human resources, information communication technology and finance by a number of liaison staff working in national HSE administration. In addition, due to the critical importance of successfully implementing the National Ambulance Service Control Centre Reconfiguration Project – and mitigating any risks associated with such a large-scale change project – the Chief Operating Officer/Deputy Director General appointed an Assistant National Director of Transformation and Support to the Leadership Team in order to support the planning and organisation of the project.

Since immediately before the establishment of the HSE in 2005, the Executive management arrangements within the National Ambulance Service have gone through a number of changes in leadership. There have been three Directors of the National Ambulance Service over the past nine years, two of whom have been appointed in the period October 2010 to November 2014. The current Director of the Service has been in post in an acting position since July 2013. It was reported to the Review Team at interview that in order to strengthen Leadership Team functions within the National Ambulance Service, the Director of the National Ambulance Service recently appointed two full-time people from within the Service's ranks to the Leadership Team with responsibility for human resources and finance.

The review identified numerous examples of the internal transfer and promotion of staff throughout the ranks of the National Ambulance Service. Some of these staff reported at interview that while they had been given a generic job description which related to their grade, they did not have a formal job description outlining the specifics of their role and the aligned responsibilities. More worryingly, some staff reported that while they had accepted a new position within the Service, they did not have the requisite technical knowledge for the particular post.

It was reported at leadership level that there is ambiguity as to who has overall executive accountability for the quality and safety of service delivery. Senior staff reported that the leadership lines between the National Ambulance Service and the Chief Operating Officer/Deputy Director General are unclear, with staff unsure of who is ultimately accountable for actually running the service.

For example, it was reported that the Chief Operating Officer/Deputy Director General is closely involved in the operational management of the service with a high level of daily interaction with the Director of the National Ambulance Service.

The Review Team met with individual Leadership Team members and reviewed the agenda and minutes of the Leadership Team meetings, which take place fortnightly within a structured format. Minutes from a five-month period recorded that attendance rates from each member were good with members giving an update to the team in respect of their functional areas. The Leadership Team meetings were effectively organised and led. However, through the minutes reviewed, and through staff interviews, there was little evidence that areas of underperformance against the operational plan objectives were being challenged at these meetings, for example, response times specific to particular control centres.

In addition there appeared to be limited assurance sought specifically in relation to maintaining the quality and safety of the ambulance service. For instance, conducting sequence-of-events audits, reviewing staff vacancies and reciprocal controls, incident trending and corrective actions and dissemination of learning from incidents. This was further explored at interview, with some members of the Leadership Team demonstrating limited awareness of key quality and safety indicators and priority assurance metrics that they should be aware of to assure themselves of the safety of the ambulance services that they govern.

At an individual level, a performance management and development system – widely used in the public and private sector as a mechanism for the personal development and performance management of staff – has been in operation for the Leadership Team since 2012 based on the HSE Performance Management System. Performance is measured against the actions from the Operational Plan. Evidence in relation to schedules of review meetings between the Director of the National Ambulance Service and the Leadership Team were submitted for 2014 as part of the data and document request by the Authority. The format and structure of these meetings was discussed at interview. Some senior staff suggested that the meetings were often a missed opportunity in the context of staff development as managers were not routinely held to account for their individual and service-line performance. Furthermore, it was of significant concern to the Authority that some senior staff reported having had no formal education, training or experience in senior management prior to appointment. These staff also reported a deficit in internal HSE and or National Ambulance Service mentoring and support programmes to assist them in developing the skills and competencies required for such senior managerial positions.

This was further explored at interview where it was reported that in May 2014, midway through the Authority's review of the ambulance services, the Chief Operating Officer/Deputy Director General requested the HSE's Human Resources Director to review the current management structures and staff roles particularly in the context of the draft National Ambulance Service strategy 2014–2016.

At the time of this Authority report, this HSE Human Resources review had not been completed and any initial findings were not available for review. Senior HSE staff indicated that the report is due to be completed by December 2014.

Corporate risk management

At the time of this review, the National Ambulance Service operates within the risk management policy framework⁽²²⁾ developed by the wider Health Service Executive (HSE), using a risk register to formally record, risk rate and identify actions to eliminate or mitigate these risks. It was explained to the Authority that at the time of the review, the National Ambulance Service did not have a risk manager. However, it was explained that training in relation to this policy had started across the service, and that at the time of the Authority's review, not all members of staff had received this training.

The National Ambulance Service 2013 and 2014 risk registers were viewed by the Review Team during the Authority's review. It was identified by the Authority that there was a relative lack of clinical risk included in the register – only one risk relating to the inability to ensure appropriate practitioner deployment to certain conditions was identified. Risks identified included an inability to comply with response time targets, the potential impact of staff fatigue and patient safety.

The number of risks identified would appear to be relatively low when compared to the complexity and nature of the overall operation provided by the National Ambulance Service and indeed did not appear to reflect those risks already identified through the reconfiguration project. It was also unclear from the register where many of the risks had originated from. However, each risk had a member of the senior Leadership Team assigned to it for resolution, and there was evidence provided to the Authority of ongoing review of the register with status updates over time as risks were mitigated.

In more general terms, the Authority's review process identified that an effective organisation-wide approach to the management of risk was not operationally embedded or integrated across all levels of the Service. Many of the risk issues persistently identified by front-line staff and supervisors at focus groups, hosted by the Authority as part of this review, had not risen to reach the organisation's risk register. This was despite widespread awareness on the ground of the issues expressed to the Review Team.

Staff described a lack of responsiveness from leadership in addressing concerns in relation to risk. For example, staff repeatedly told the Review Team that concerns that had been raised about the ongoing general suitability of ambulance station facilities, including sluice facilities, failed to result in the required level of recognition or response. Staff also regularly voiced concerns around the availability or suitability of equipment, including the lack of satellite navigation in ambulances.

Documentation was provided to the Review Team that demonstrated a fragmented approach to the management of risk across the country. Evidence provided highlighted the existence of five separate regional committees for the management of health and safety related matters: one for the north Leinster area, two in the western area (northwest and midwest), and two in the southern area (southeast and southwest). Membership of each group comprised elected representatives from amongst the ranks of staff and management.

On the basis of minutes from meetings provided, it was evident that these committees acted as an additional means to raise safety concerns. However, it was often unclear from the minutes what reciprocal actions were intended or introduced to address concerns. In one meeting, the chairperson expressed disappointment at the ongoing poor levels of attendance from staff. Many of the issues raised at each group were of potential relevance to all staff across the country. In spite of this, it was unclear if there had been attempts to share information between local and regional committees and with the Leadership Team, or indeed collate information on common trends in a systematic national way. Furthermore, a number of issues which were highlighted as requiring escalation to the Service's corporate risk register had not appeared on the register at the time of the Authority's review.

On the basis of the totality of evidence provided to the Authority during this review, it is clear that the current infrastructure in place to proactively capture and subsequently manage risk in the National Ambulance Service is overcomplicated, and ineffective in its ability to systematically highlight, effectively escalate and rapidly address persistent national issues in an efficient way.

Operational management

As described in the methodology section of this report, in undertaking this review, the Review Team met with a significant number of staff at all levels across the organisation. The purpose of this approach was to gain an understanding at every level of the organisation. This interaction occurred through a number of focus group sessions, meetings and interviews, and on-site observation in several ambulance control centres nationwide. The methodology employed also included the shadowing of a number of paramedic and advanced paramedic crews on day shifts.

At every interaction, it was evident to members of the Authority's Review Team that staff at all levels and grades are highly motivated and wanted at all times to provide the highest quality pre-hospital emergency care possible. In addition, it was obvious that staff had for the most part at an individual level, good interpersonal and inter-professional relationships with colleagues and any frustrations they articulated were driven by a collective desire to improve services.

The Review Team explored the operational management arrangements through the lens of the operational management staff. It was evident from both focus groups and interviews that while the transformation to a national ambulance service within a single governance structure has happened, many structural legacy problems still remain. For instance, it was reported at interview that the critical support functions like human resource management and finance are not joined up, with multiple systems in place hampering efficient business reporting at a national level.

Furthermore, front-line management and clinical staff met by the Review Team consistently reported that they felt the organisational structure in place at the time was not always efficient and did not constantly support front-line staff. For example, staff reported that there was no formal arrangement for the availability of middle and senior management personnel, with the aligned competencies and decision-making capabilities after 5pm. This was further explored by the Review Team with staff citing that in some instances incidents occurring at night and at the weekend may not be dealt with in a timely and or consistent fashion.

In addition, it was consistently expressed at focus groups that the communication systems between senior and middle management and front-line staff, particularly in the context of the national change agenda, were ineffective. Formal discussion forums were minimal, staff reported, and the most common mode of communication was via written memos posted to the ambulance station.

While front-line clinical staff expressed frustration, middle managers and supervisors were also frustrated. These grades of staff consistently articulated the minimal level of autonomy given to allow them to effectively execute their role. This was further explored at interview. By way of example, senior managers explained a situation whereby they were given responsibility for the management of the equipment inventory, which is subject to a finite budget. It was reported that these managers would, however, not be provided with specific information outlining the extent of their budget allocation, nor were they provided with the relative cost of equipment.

These managers perceived that the disempowerment that resulted from such a centralised approach to management did not allow them to make decisions based on operational needs and did not award staff an opportunity to develop and become confident within their management positions. As a consequence, many managerial staff felt that they were undertaking their role without the necessary information, confidence, support or perceived autonomy. Staff acknowledged that the National Ambulance Training School had delivered a management training programme to new officers in 2013. However, they felt that the prevailing culture of management training and development, for both clinical and non-clinical leaders and managers could be improved.

It was also evident that many staff felt hindered in their ability to provide quality care in a seamless fashion. This was often attributed to the organisational structures in place at the time and the lack of clear processes to underpin front-line performance. For example, they cited lack of formal feedback from management, absence of any performance management processes and inadequate management and clinical mentoring and supervision.

The Review Team also found a high level of frustration within the Service due to its multiple layers of management. During interviews, it was reported that the allocation of resources and the work deliverable were not managed efficiently. For example, it was reported that an operations resource manager can spend a high percentage of their time doing administrative duties such as fleet inventories, ordering supplies and equipment or managing overtime payments. This was opposed to dedicating their time to ensuring better delivery of operational performance through effective management and use of available resources, or through working alongside the control centre manager to devise and implement plans aimed at improving response times.

Operational management of control centres

At the time of this Authority report, the National Ambulance Service operates its command and control function from six regional ambulance control centres. As identified throughout the review, the National Ambulance Service reiterated the critical importance of, and its focus on, successfully implementing the National Ambulance Service Control Centre Reconfiguration Project, which would transform the delivery of pre-hospital emergency care services in Ireland. One ultimate and crucial aim of this project is to ensure that when people who require an emergency ambulance telephone 999 or 112, an efficient emergency response is enabled through precise and timely call-taking, dispatch and mobilisation.

In addition, there needs to be effective communication pathways and protocols between ambulance control and the operations department of the National Ambulance Service. The role of the operations department is to provide the resources required by ambulance control to respond to emergency and other calls. This requires ongoing forward planning and cooperation between both departments when requests for leave, sickness absence and training have the potential to reduce the required numbers of staff, and impact on delivery of service.

The operations department must ensure resources are of the right skills mix, and have suitable vehicles (ambulances, emergency response cars and officer cars), equipment, and stations to be deployed from. Regular meetings present opportunities to discuss and mitigate any logistical difficulties with fleet, estate, equipment and resourcing. They also facilitate working in a cohesive manner to identify the cause of poor performance.

These pathways should be facilitated with regular management meetings between ambulance control and the operations department. Although both departments have different functions and roles and are generally managed separately, close cooperation and interaction between the two is a precondition for the delivery of a safe and effective pre-hospital emergency care service to the public.

As a consequence, by this stage of the implementation of the National Ambulance Service Control Centre Reconfiguration Project, the Authority would have expected that the control function (that is, call-taking and dispatch) and the operational function (that is, to mobilise to, treat and transport the patient) would be seamless.

Findings

An area performance manager, a member of the Leadership Team, has corporate responsibility for the operational efficiency of all six control centres and responsibility for the operational function of the north Leinster and the southern region. A second area performance manager has operational responsibility for the western region. The review team was informed that an operations performance manager was formally appointed in June 2014 with delegated responsibility for the operational management of all six control centres and is a member of the reconfiguration project team. The role and function of this post was explored at interview. The post-holder explained that the control centres are managed by duty control managers who report directly to him and apprise him of any issues, risks and adverse events which he in turn reports to his line manager.

The post-holder highlighted the most significant risk is to maintain safe staffing levels in some of the control centres, which he attributed to a baseline lack of sufficient staff numbers to maintain rosters without overtime. This in turn meant that these centres were continuously challenged to separate the call-taking and dispatch function as recommended in a National Ambulance Service commissioned report into an incident (incident 50379)⁽²³⁾ published in late 2013.

The Authority reviewed these staffing levels in September 2014 and found that on some occasions the staffing levels in some centres fell below the required safe levels. This risk was escalated during the review by the Authority to the National Ambulance Service. The Authority examined the call and dispatch processes in all control centres nationally, and identified that there is scope for rapid improvement in performance, so long as any corresponding staffing deficits are also addressed. As an example, the Review Team examined the processes in the Townsend Street control centre in Dublin, which provides control centre coverage in the areas of north Leinster, Cork and Kerry as well as Dublin.

The data submitted by the National Ambulance Service demonstrated consistent underperformance in the efficiency of call-taking and processing of emergency calls. This contributed to poor response times to ECHO and DELTA emergencies. Despite this poor performance, there was no evidence to suggest that staff were aware of performance failure, and there have been no tangible high-impact changes introduced to address these deficits in performance.

For example, other ambulance services have worked to improve the operational efficiency of call handing and dispatch through the introduction of measures such as a more streamlined address verification process, allied with intensive training, or universal deployment of crews over the radio system rather than using the telephone. Many different process improvement changes have been introduced by ambulance services internationally to achieve better performance in call handling and dispatch, and the composite effect of introducing each improvement measure can save valuable seconds per call.

The corresponding introduction of visually displayed real-time tracking of performance in the achievement of each call-handling process-step in the control centre, can act as an effective way to supplement improvement efforts. Staff awareness of regular performance helps to promote a collective culture of performance improvement. Such a culture was not evident in National Ambulance Service control centres at the time of the review.

Control centres (call-taking and dispatch) need effective communication pathways and protocols which work in synergy with the operations department of the service. The operations department is predominately responsible for the provision and resourcing of vehicles and staff to ensure suitable mobilisation to emergency calls. The Review Team found that while there is a monthly meeting taking place between control management and operational managers in the north Leinster and southern regions, it was reported that formal links with the western region had not yet been put in place.

Furthermore, at the time of the review there was no evidence available to confirm that there was any formal planning and communication process in place between the National Ambulance Service and Dublin Fire Brigade to safely manage the transition and relocation of the Service's control centre in Townsend Street to Tallaght, some 8 miles away, and to ensure the seamless transfer of emergency calls between both service providers.

These findings would suggest that the National Ambulance Service will find it difficult to effectively deliver the outcomes aligned to its Control Centre Reconfiguration Project if there is poor integration and communication between control and operational functions and between the Service and Dublin Fire Brigade, as discovered during this review. In addition, at the time of the review there was no evidence available that call-takers and dispatchers have an agreed minimum dataset which would identify daily critical performance information for both them and managers to reflect and improve on.

Role of the Pre-Hospital Emergency Care Council (PHECC)

Prior to the foundation of the Pre-Hospital Emergency Care Council (PHECC) in 2000, there was very little clinical governance oversight of the provision of pre-hospital emergency care in Ireland. In practice, there was little standardisation nationally on what treatment modalities were provided.

There was also no statutory basis for the administration of medicines by practitioners – the establishing law setting up PHECC acted to fill this need.

Thereafter, PHECC fulfilled this function through the development of education and training standards for practitioners, and a system of registration and fitness to practise. This system universally applies to all pre-hospital emergency care practitioners, regardless of their employer. Over time, PHECC has developed an ever evolving suite of clinical practice guidelines⁽³⁾ which represent best practice in pre-hospital emergency care. Practitioners are mandated to follow these dependent on their training grade. Staff are then provided with credentials for use by the individual service provider.

The Pre-Hospital Emergency Care Council also has a role in oversight of a service provider's ability to use clinical practice guidelines. Sanction to use these guidelines is provided following accreditation of the service provider by PHECC to safely use the guidelines. The accreditation process includes assurance that the service provider is in a position to ensure their safe application, including an appropriate ability to provide training and upskilling for practitioners.

In addition, PHECC maintains oversight of treatment modalities used by practitioners and coordinates the governance of the grading of dispatch codes in terms of the weighting of responses from ECHO to OMEGA* calls, through its priority dispatch committee. In doing so, the Council avails of expertise from the service providers through the inclusion of practitioners from each service on its internal committees. The Director and Medical Director of the National Ambulance Service have a prominent and ongoing involvement with important PHECC committees including the Pre-hospital Care Council, Medical Advisory Committee and the Priority Dispatch Committee.

It was notable that senior staff within the National Ambulance Service reported to the Review Team that there is a potential for overlap between the role of PHECC and the evolving clinical governance arrangements within the National Ambulance Service. It is the Authority's view that there is therefore a requirement to clearly define the roles of both organisations in respect of clinical governance. This should include exploration of the potential for review of the current governance arrangement in relation to dispatch code prioritisation.

Dublin Fire Brigade

Through a 2012 memorandum of funding with the National Ambulance Service, Dublin Fire Brigade provides a pre-hospital emergency service in the Dublin area – this will be reported on in chapters 7 to 9 of this report.

* Patients with a minor illness or injury.

Chapter 3 – Clinical governance

An emergency ambulance service that is focused on effective and safe care continually strives to attain ever greater reliability and ongoing improvement in the quality and safety of the service that it delivers. Effective governance and risk management are required to enable the achievement of high performance. Given the ever expanding scope of clinical practice within pre-hospital emergency care services, strong clinical governance structures and practices are also critical to underpin the ongoing development of this aspect of patient care.

Clinical governance

Clinical governance is defined by the HSE as ‘*corporate accountability for clinical performance*’, or alternatively ‘*governance for quality and safety*’⁽²⁴⁾. Clinical governance describes the system through which healthcare teams or practitioners are accountable for the quality, safety and experience of patients under their clinical care. In practice, this requires the clinical team or practitioner to be explicit in the clinical standards that they intend to deliver. In addition, it also requires them to be able to demonstrate through valid measurement tools that the required standards are being met.

In reviewing the effectiveness of the clinical governance arrangements, the Review Team utilised the National Clinical Governance Checklist⁽²⁵⁾ under the following headings:

- accountability and governance
- clinical risk management
- clinical effectiveness and audit
- managing performance
- quality and performance indicators.

This chapter outlines the Review Team’s findings in relation to each of these key facets. Managing performance is also examined in Chapter 4. Quality and performance indicators are likewise additionally discussed elsewhere in this report.

Findings

Accountability and governance

Historically, clinical governance in the National Ambulance Service has been underdeveloped, with much of the governance oversight of practitioners provided externally by the Pre-Hospital Emergency Care Council (PHECC). In recent times, the appointment of a full-time Medical Director has provided the National Ambulance Service with greater internal clinical leadership capacity at a senior management level.

At the time of this review, the service had acted to articulate an outline vision for clinical governance in the form of a written Clinical Governance Framework document.

The Medical Director reports to the Director of the National Ambulance Service. He is supported in his role by a Medical Directorate team which consists of a part-time Assistant Medical Director and three part-time Area Medical Advisors (AMA). All are emergency medicine consultants. This team works closely with the National Ambulance Service Education and Competency Assurance team to ensure ongoing education and training of staff. This Directorate also works closely with the Centre for Pre-hospital Research at the University of Limerick in conducting practice research.

Effective clinical governance is not the responsibility of any one person – rather it is collective, with all staff at every level having a shared responsibility and accountability for ensuring that service users receive the right care, at the right time from the right person. It is the professional and ethical responsibility of all staff who are involved in the provision of clinical care, irrespective of grade or rank, to proactively contribute to the progression of the clinical governance agenda across their service.

Notwithstanding this need for collective accountability, the corporate and leadership responsibility for clinical governance necessitates the dual Chief Operating Officer and Deputy Director General, the Director of the National Ambulance Service and the Medical Director to work in partnership with the Leadership Team. This is to ensure that strong and resilient structures and arrangements, which include clear lines of accountability and delegated responsibility, are in place to support clinical governance. This includes, but is not limited to, the foundation and execution of effective quality assurance mechanisms, designed to support a safe and effective service.

It was not evident during the review that such an organisation-wide approach to clinical governance was in place or appropriately led, resourced or structured, or therefore an integral part of the overall functioning of the Leadership Team as a collective. Assurance mechanisms which are focused on clinical governance, and therefore the clinical performance of practitioners, remained limited proportionate to Leadership Team oversight of other non-clinical aspects of the service, such as overtime expenditure or fleet management.

Clinical risk management

As with any healthcare clinical service, the provision of pre-hospital emergency care carries – through necessity – a burden of risk which needs to be effectively managed. This process needs to strike an appropriate balance between the effective application of international best practice in the provision of care, while ensuring the ongoing capability and capacity of practitioners to provide that service in an appropriate and reliable way.

It was evident on review of the National Ambulance Service risk register that clinical risk was lacking. This was surprising, as any clinical service should expect the main burden of risk to rest with the provision of clinical care. In more general terms and as already discussed, the Review Team identified that there was a fundamental disconnect in the mechanisms for the reporting of risk from the front-line to the senior management team. The usual mechanisms for determining clinical risk include analysis of adverse incidents, the reporting of 'near miss' situations, or potential risks as perceived at the front-line, analysis of patient experience and crucially, clinical audit. The Review Team therefore focused on all of these crucial aspects of the National Ambulances Service risk management infrastructure to determine if the current approach to clinical risk management is sufficiently sensitive and fit for purpose.

Incident and adverse event reporting

While carrying out this review, the Authority was told that on appointment, the Medical Director identified a deficit in the service's approach to incident and adverse event reporting that as a priority required immediate corporate attention. It was reported that prior to his appointment there had been a limited culture of reporting adverse incidents and near misses.

As a consequence, the ability of the service to identify adverse incidents was largely driven by complaints and the fitness to practise regime overseen by PHECC. It was also reported that there was limited learning from adverse events or 'near misses' that had occurred, and that low reporting rates meant that the identification of potential latent risk – which might be highlighted from an effective reporting system – lay undiscovered.

The National Ambulance Service first introduced a policy to deal with the management of adverse clinical incidents in May 2011. The policy requires staff to report incidents or near misses to their local education and competency assurance manager or to the operations performance manager in the case of absence of the education and competency assurance manager as soon as possible after its occurrence or detection. The education and competency assurance manager is then tasked with making safe any immediate problems, and risk rating the incident with the local area medical advisor (AMA) along a scale from A-E, denoting the severity of the incident as negligible, minor, moderate, major or severe. Issues that are considered to be moderate, major or severe are escalated to the Medical Director for further investigation. Incidents or near misses of lower severity are expected to be dealt with locally by the education and competency assurance manager, with quarterly reporting to the Medical Director in collaboration with the AMA.

At the outset of the review, the Authority requested that the National Ambulance Service provide it with details on the number and nature of clinical incidents that it had dealt with since 1 January 2012 to the commencement of this review in April 2014. The National Ambulance Service explained that there was no formal system of trend analysis. This is of concern to the Authority as ongoing analysis of the collective experience of such events allows for the prioritisation of improvement efforts on the basis of risk, and is a crucial aspect of any successful risk management strategy.

In the period between 1 January 2012 and 17 April 2014, the National Ambulance Service recorded the reporting of 21 incidents. Thirteen of these incidents (62%) fell into the negligible to minor category. A further three were classified as moderate, one was major and four were extreme. Serious incidents are expected to be dealt with in line with a wider HSE serious incident management policy and all had been escalated to the HSE in line with this policy. All four extreme incidents were thoroughly investigated by the Service internally, and again evidence of this was viewed by the Authority. It should be noted that the number of less severe incidents recorded was relatively low, and indeed much less than would be expected based upon the collective experience of the Review Team in benchmarking against other services.

It could be argued that this emanates from a low absolute occurrence rate for incidents. However, unverified evidence, including the totality of events that have been reported on publically in the media in recent times, would be at odds with this assumption. It is therefore more likely that the reporting rate is low relative to the actual occurrence rate.

Organisations with high reporting rates have a much greater awareness of risk. It would be expected that in every organisation that needs to manage high risk as a result of the inherent nature of their business, that for every serious adverse incident that happens, prior awareness of the latency of that risk might have been detectable through proactive measures. These measures might include monitoring, detection and mitigation of more minor adverse incidents. Learning from other similar services, or different industries that may offer safer ways of doing things, should also provide an outlet for learning in a progressive, safety conscious service. Organisations that have high reporting rates tend to be safer for staff and service users, as they are in a better position to proactively address low-level risks before their cumulative presence results in a more catastrophic outcome. The current low rate of reporting in the National Ambulance Service does not lend itself to such an approach, and does not yet provide the senior Leadership Team with the required visibility of risk to effectively manage that risk for the benefit of patients and staff.

Disseminating learning from adverse events

In undertaking this review, the Authority conducted a number of focus group sessions with front-line staff across the country. A key component of these sessions was intended to explore the National Ambulance Service's approach to dealing with adverse incidents on the ground, and any associated learning that occurred in the service as a result of investigation into adverse events. These sessions explored the prevailing culture amongst staff in relation to the reporting of incidents and their subsequent handling. In addition, other on-site activity from the Review Team included an evaluation of the management of risk and learning from adverse events.

In late spring 2013, an emergency call was made to the National Ambulance Service. An ambulance was not dispatched to the scene, and following a sequence of additional events, the patient (a young child) subsequently died in hospital a number of days later. Following this incident, an investigation was commissioned by the National Ambulance Service, and lead by an independent chairperson, which culminated in a report being published: *The Report of the Investigation of incident 50379* ⁽²³⁾.

As part of the Authority's review, the Review Team investigated the progress made by the Service in implementing the recommendations from this report, in the seven months between its publication and the outset of this review. This exercise revealed that some of the recommendations had been enacted in that time, including the comprehensive introduction of a more thorough system for dealing with callers who have difficulty with speaking English. However, full implementation of all of the recommendations had not yet occurred. Many of the recommendations from the report related to the functioning of National Ambulance Service control centres and included a requirement to ensure the separation of roles between call-takers and dispatchers in each centre.

The Authority reviewed the status of these recommendations while on-site in control centres across the country, and found that adequate role demarcation was not fully in place in all centres. This was as a result of inappropriate control-centre staffing levels. Also, the required level of advanced quality assurance on calls (AQUA reporting) was not routinely occurring in the majority of control centres. International best practice requires that a minimum 3% of calls per month are audited to ensure that the call-taker follows the validated call-taking protocol accurately. Failure to follow this protocol to the letter can result in inappropriate categorisation of calls. Audit with feedback acts as a quality assurance measure to mitigate poor practice issues that can permeate over time into call-taker performance. The Review Team revealed that only one out of the six control centres in operation was in compliance with this requirement, and following escalation of this risk to the National Ambulance Service by the Review Team, full AQUA reporting was reinstated in all centres.

The Authority explored incident and adverse event reporting with front-line and management staff. It was evident that senior management staff had a heightened awareness of the expectation to report clinical incidents and of the potential benefit this could yield in terms of improvement for patients. However, it was common for front-line and middle management staff to report that they were reluctant to continue to report minor and moderate incidents due to the absence of a reliable and structured feedback process following previous efforts at highlighting issues. A common view among staff was that they could not see any action resulting from their reporting of issues, many of which they described as being recurrent problems.

While it might be frustrating to not receive feedback in such circumstances, all staff still have a professional responsibility to promote and contribute to this system in the interest of patient and staff safety. Lack of feedback does not exempt non-reporting and all staff in the National Ambulance Service must redouble their efforts to advocate for and fully embed this critically important aspect of clinical governance, whether through continued reporting or more efficient feedback mechanisms.

Staff also reported to the Authority that the National Ambulance Service's approach to the sharing of findings from adverse events – to try to prevent or minimise their reoccurrence – could be better. Some front-line staff cited the dissemination of information in relation to incidents was more likely to occur via the staff grapevine rather than through official channels. It is recommended that the National Ambulance Service reviews and audits its approach in relation to communication of findings to promote collective organisational learning.

It was explained at interview with more senior staff that since the beginning of 2014 a new forum for the active review and collective analysis of clinical incidents had begun amongst the education and competency assurance officers in the Service who now meet monthly to discuss these issues. This is a potentially positive development which should be further nurtured to enable more systematic analysis of adverse clinical incidents, and the rapid sharing of learning from these. However, it was too early to determine during this review what impact this had achieved in practice. Furthermore, the Authority welcomes that – in September 2014 – the National Ambulance Service reported its intention to appoint a risk manager reporting directly to the Medical Director. It is important, however, that the functions of both clinical risk, and corporate risk are equally resourced at a senior management level in the organisation.

Management of direct calls from general practitioners

General practitioners (GPs) represent a large cohort of callers for emergency ambulances by caller type. Historically, on calling for an ambulance the GP would usually provide details to the control centre in relation to the nature of the call and the required time frame for a required ambulance.

Unlike other callers for emergency ambulances, calls from GPs are not usually processed by call-takers using the Advanced Medical Priority Dispatch System which provides a unified system used to dispatch appropriate aid to medical emergencies.

In practice this means that the National Ambulance Service has two parallel call prioritisation systems in place. This system is not unique to Ireland. However, to manage the aligned risk, other jurisdictions have introduced the use of a more abridged prioritisation system for GP urgent calls known as Card 35 on the Advanced Medical Priority Dispatch System. This allows the ambulance service to better prioritise the allocation of resources for each type of call on the basis of patient need.

Not using such a system was explored with the National Ambulance Service during the review. The Service believed that using a process such as Card 35 was unnecessary as the inherent risk is mitigated by the practise of automatically upgrading the call to an emergency call after the time limit set by the GP had been exceeded. However, because this potential risk is regarded as high in other international ambulance services internationally, the National Ambulance Service should evaluate the efficacy of this control in its quality assurance programme.

Complaint and compliment management

A key means of guiding the clinical governance agenda in any organisation is to listen to service users and learn from their experiences, both good and not so good, to inform continuous improvement. This may occur through actively soliciting for information through the use of surveys, service-user panels or focus groups. In addition, analysis of unsolicited information received in the form of complaints and compliments can also help organisations to identify strengths and weaknesses for further improvement.

The National Ambulance Service, in line with other service providers in the wider HSE, receives compliments and complaints in line with the HSE's 'Your Service, Your Say' policy and process⁽²⁶⁾, and also receives complaints via local patient advocacy channels. The Service has a network of three area managers who deal with complaints, and a national manager who provides a coordinator function. Evidence was provided to the Authority detailing the quantity, general nature and current status of complaints furnished to the National Ambulance Service via the HSE process for 2012, 2013 and the first four months of 2014. In total there were 28 complaints received by the service in 2012; 26 in 2013; and six during the first four months of 2014.

The rate of complaints received was therefore consistent, with roughly two complaints a month being lodged with the service. It should be noted that the National Ambulance Service highlighted to the Review Team that it does not systematically record all complaints received locally, and that they may be handled in a local manner without recording the complaint. As a result full visibility of common themes is not present.

Of those complaints that were recorded, a number of the complaints logged from the HSE system remained open at the time of the Authority's review. Indeed, 3 of the 28 complaints from 2012 remained under investigation and had not been closed off as of April 2014, and 7 of the 26 from 2013 remained unresolved and not in line with the HSE benchmark which requires a response to complaints within 30 working days. Many of the complaints appeared to be of a serious nature. Failure to address them in a timely manner increased the potential for reoccurrence should the premise of the complaint prove to be true. It is of significant concern that the National Ambulance Service, given the small number of complaints on its books, does not have effective arrangements in place to deal with these.

In addition to complaints, the Service also regularly receives compliments from services users. In the period between 2012 and the first half of 2014, 27 compliments from prior service users or their families were formally recorded. These compliments centred on the professionalism and demeanour of staff, and gratitude in relation to swift action that the service enacted to save patients' lives. The themes outlined in these compliments, especially in relation to the professionalism of staff and their compassion when dealing with patients, was consistent with the experience of Authority staff observing the work of National Ambulance Service staff during this review. It is likely that these formally reported compliments underestimate the gratitude expressed informally to National Ambulance Service staff on a daily basis.

It is recommended that the National Ambulance Service improves its patient advocacy approach, including its responsiveness in the handling of complaints. It is critical that this is addressed as a priority to ensure that any opportunity for learning is captured in a timely manner, and that those members of the public that have felt sufficiently compelled to complain are provided with a satisfactory response from the service.

Likewise, many patients have a very good experience in their interaction with the National Ambulance Service. It is important that the service finds a way to more effectively disseminate compliments both to the staff involved, and the wider service in the interest of reinforcing staff morale. Finally, the National Ambulance Service could do more to proactively listen to service users to better inform its approach to service delivery and development, and it is recommended that the Service act to formally seek information on patient experience through survey, service-users panels or focus groups.

Clinical effectiveness and audit

The current model of care provided by the National Ambulance Service

When a service user calls for an emergency ambulance in Ireland, the call is prioritised and responded to by an ambulance on every occasion, unless the call is subsequently cancelled by the caller. On arrival at the scene, the patient is provided with pre-hospital emergency care by the practitioner and, unless the patient refuses to consent to being transported, they will be routinely taken to hospital for ongoing assessment and treatment as required.

Patients have historically been transferred to the nearest hospital emergency department. More recently, and as a result of collaboration with a number of clinical care programmes in the HSE, patients with certain conditions^(27;28) may be transported to a more distant, yet more appropriate hospital through use of a 'bypass protocol'. These protocols ensure that for certain conditions such as stroke, patients receive timely intervention from specialists in more distant settings using best practice techniques which may not be routinely available in a more local emergency department. Such an approach ensures better patient outcomes⁽²⁹⁻³¹⁾.

The number of calls received per annum for ambulances in Ireland continues to increase, with a 10% increase reported by staff between 2012 and 2013. Increased call volume translates into an ever increasing number of patients being transported to hospital for treatment. This is unsustainable. Many jurisdictions internationally have acted to address the increased burden this places on both their ambulance and emergency department (ED) services through the use of methods to treat patients without transporting them to the ED. This can take the form of input from a clinician routinely directing practitioners over the phone via the control centre (known as 'hear and treat'). It can also involve practitioners being trained to independently treat and discharge patients at the scene, or through transportation of patients to non-ED settings such as local injuries units or general practice surgeries, should the patient's condition lend itself to effective assessment and treatment in either setting.

The National Ambulance Service has begun preliminary efforts to begin this journey of innovation in practice with the introduction of a pilot programme of 'treat and refer' in the southeast of the country. This is a welcome development. However, it will take strong strategic planning, time and a significant investment in training and stakeholder engagement for this initiative to reach the point where a meaningful downward impact on the rate of ambulances taking patients to hospital will occur. As of early July 2014, the Authority was told by the National Ambulance Service that this pilot had only identified two potential patients who were suitable for recruitment. In both cases, they did not consent to the National Ambulance Service discharging them and instead opted for being transported to hospital.

A detailed strategy supported by a solid project development plan is required, and the expansion of current advanced paramedic numbers will be critical in helping this approach. In addition, the Review Team identified that extensive development of the National Ambulance Service clinical governance infrastructure will be necessary to safely enable a transition away from the current status quo of 100% transporting of patients to hospital beyond this pilot programme.

In addition, the status quo of always transporting patients to hospital ties up ambulance resources that may be better used in what is an overstretched environment. The decision to take a patient to hospital, who might have been suitable for discharge at the scene of the event, presents an opportunity cost to the detriment of other patients who might have a greater clinical need for services. Emergency departments themselves cannot withstand this additional and ever increasing volume of work. At interview with senior management staff, the Authority identified that there was a reluctance to accept the risks associated with not taking people to hospital beyond very tight criteria in principle, without fully considering the present risks associated with the current model of care.

Service-user awareness and consent will also be crucial to enable the success of this change in approach to the model of care provided. This will require extensive public information to further highlight both the expertise of paramedics and advanced paramedics as healthcare professionals, and the relative benefits of treatment without transportation to the ED for those patients whose condition allows for alternative approaches.

Clinical audit

Clinical audit may be defined as a clinically led, quality improvement process that seeks to advance patient care and outcomes through the systematic review of care against clear criteria, and to act to improve care when standards are not met. Clinical audit is therefore crucial for any healthcare provider and particularly critical in pre-hospital emergency care as practitioners often act in relative isolation in the time between starting patient care to arriving at the emergency department.

The HSE recognises clinical audit⁽³²⁾ as a reliable method of:

- proactively measuring the effectiveness and performance of healthcare against agreed standards for high quality
- improving the quality of care provided to service users by identifying actions to bring practice into line with these standards
- providing the assurance of quality to service users, practitioners and to the health system as a whole.

At the time of writing, the National Ambulance Service did not have a systematic centralised approach to clinical audit. This meant that the Service did not have an effective way to assess current clinical practice to include the:

- level and standard of patient care
- ongoing competencies of front-line clinical staff
- adherence to clinical policies and guidelines.

As a result, the opportunity to improve patient care and outcomes through the methodical review of care against clear criteria is not happening.

It was acknowledged by senior management staff at interview that lack of clinical audit was a significant deficit which hindered effective clinical governance. The Authority was told that barriers to the implementation of clinical audit included a lack of dedicated staff to coordinate audit, and the lack of an electronic patient record which could better facilitate rapid audit. This is not acceptable, as despite these constraints, other HSE service providers and international ambulance services regularly find a way to facilitate clinical audit through a targeted manual approach to data collection. The lack of such an infrastructure should not delay the undertaking of targeted audit, as significant benefit for patients, staff and the wider organisation could be built up as a result. It should also be noted that audit requires data analysis, evaluation and action in response to finding, with data collection being only the first step in this process. The procurement of an electronic patient record system will therefore only promote improvement in patient care, if accompanied by these additional sequential steps.

Clinical audit should be the responsibility of all clinical staff as an integral part of their role as healthcare professionals. It is now the norm for staff in other services to regularly contribute to audit activities in addition to their regular workload in an effort to improve patient care. It is vitally important that the National Ambulance Service acts without delay to build an internal programme of clinical audit within its current resources. This must be embedded and supported at all levels of the organisation to provide improved care, and to reinforce current clinical quality assurance mechanisms.

The Authority believes the National Ambulance Service should appoint a suitably qualified person to lead the clinical audit function, who has the requisite competencies to proactively work with the Medical Director and front-line clinical staff in developing an incremental targeted audit programme. The introduction of clinical audit in this way will allow the Service to assure itself, its staff and the general public about the quality and safety of its pre-hospital emergency care service.

National Ambulance Service's self-assessment against the *National Standards for Safer Better Healthcare*

The National Ambulance Service provided evidence to the Authority of a HSE self-assessment exercise⁽³³⁾ conducted internally against the *National Standards for Safer Better Healthcare*. This HSE self-assessment required the National Ambulance Service to rate its own performance against each feature relating to an overall standard using a progressive four-point scale ('Emerging Improvement', 'Continuous Improvement', 'Sustained Improvement' and 'Excellence'). The self-assessment submitted to the Authority did not provide an overall self-assessment against the overarching Safer Better Healthcare Standards and themes. The National Ambulance Service self-identified a predominance of scoring of 'Continuous Improvement', or 'Sustained Improvement' against each feature assessed.

The National Ambulance Service identified that some elements of the Safer Better Healthcare Standards which corresponded to safe and effective care were in particular need of improvement. Examples of such areas included a need for improvement in its approach to ensure the ongoing competency of staff, or the need for improvement in the effective use of information systems to support service delivery.

Many of the Service's self-assessed areas for required improvement were consistent with those identified as a result of this review – for example, the self-assessment identified that there was scope for significant improvement in carrying out clinical audit and measuring clinical outcomes. The self-assessment also provided the National Ambulance Service with an opportunity to reflect on areas that it performs well in, for example, in the feature concerning the standard of clinical training provided to staff, which was also verified by this review.

It was evident to the Authority's Review Team that there were indeed pockets of very good and indeed excellent practice within the National Ambulance Service. Nonetheless, in many of the areas where a high self-assessment score against features of the Safer Better Healthcare Standards had been assigned by the Ambulance Service, the practice on the ground – as observed by the Review Team and through evidence reviewed – was at odds with some of these scores.

For example, while the National Ambulance Service identified deficiencies in the arrangements in place to assure a consistently safe and effective service, this deficit is not equally reflected in the governance, leadership and management self-assessment. By way of explanation, the Authority recognises a well-governed and managed service as one which monitors its performance to ensure reliability so that it provides care, treatment and support that is of a consistently high quality with minimal variation in provision across the service.

In addition, the Safer Better Healthcare Standards mandate that the quality and safety of services that are sourced externally (for example the Dublin Fire Brigade ambulance service) need to be monitored through formalised arrangements.

These arrangements were not found to be strong within the National Ambulance Service and, coupled with the other findings of this review, the Authority concluded that the National Ambulance Service was at an earlier stage in its evolving development than had been identified via its own self-assessment exercise.

The prevention and control of infection

The prevention and control of infection should be a key aspect of any healthcare provider's approach to patient safety⁽³⁴⁾. From an ambulance service perspective, the key components of infection prevention and control should be centred on compliance with hand hygiene best practice, appropriate usage of personal protective equipment, the management of sharps and potential exposure to patient bodily fluids, and cleanliness of vehicles (ambulances, emergency response cars and officer cars) and equipment.

Throughout the review, it was observed that it was common for paramedic staff to routinely wear gloves when treating patients. It is accepted that in many pre-hospital emergency cases it can be difficult to anticipate when it may be necessary to wear gloves. However, on many occasions there appeared to be overuse of gloves and a lack of awareness that glove usage needs to be preceded and followed with hand sanitisation. Alcohol hand gel was available on all ambulances observed, but staff awareness in relation to the need to perform hand hygiene in addition to wearing gloves appeared to be limited.

There is a daily cleaning checklist in operation for all vehicles, and there is a National Ambulance Service procedure for the cleaning of vehicles. However, it was reported at focus groups and on site that current vehicle cleaning was a concern to front-line staff as it is the responsibility of the crew to clean it between patients and also to perform deep cleaning of the vehicle once a week. In order to perform a deep clean, the vehicle and staff need to be rostered off duty.

At the focus groups, it was reported by front-line staff that they often did not have the facilities to perform adequate cleaning of their vehicles. For example, one paramedic reported that if the ambulance required cleaning between patients, there was no facility to perform this. In fact, it was highlighted that this was particularly difficult if there were blood spillages. Such a lack of basic facilities for cleaning is of significant concern, as it increases the risk of transmission of infection to both staff and other patients alike.

Front-line staff also reported during the focus groups that vehicles were not routinely rostered for deep cleaning. Management indicated that this was due to staff shortages and an inability to take a resource off of the road. While the risks associated with poor practices in relation to vehicle cleaning are acknowledged by senior management, there was no evidence of a plan in place to manage this problem.

This is of significant concern to the Authority as the proper controls were not in place to prevent the spread of infection and there is a risk to both patient and staff safety. In addition, this risk does not appear on the National Ambulance Service's risk register.

Policies, procedures and guidelines

The absence of clinical audit in the National Ambulance Service means that the service relies heavily on the individual and collective ability of its staff to routinely execute policies, procedures and guidelines without deviation. Clinical practice in the service by practitioners is determined through the development and implementation of clinical practice guidelines which are developed by the Pre-Hospital Emergency Care Council (PHECC). These guidelines are then implemented by National Ambulance Service practitioners on the ground.

The guidelines themselves are clear, concise and use an easy-to-follow and consistent format which effectively guides the user through each clinical scenario to arrive at a correct treatment modality. Staff on the ground demonstrated clear understanding of these clinical practice guidelines, which formed the backbone of their practice. However, due to the lack of clinical audit, neither the National Ambulance Service nor the Authority as part of this review were able to definitively determine the accuracy of their application in practice. Staff described an effective approach to initial and ongoing training by the National Ambulance Service on the introduction of new clinical practice guidelines which aided in their ability to remain current in their practice. However, staff explained that more recently, the ability to avail of training was less consistent than it had been in the past, which hindered the process of continuous upskilling.

On the ground, staff described variance in the flow of information to them in relation to clinical matters. While some staff described regularly receiving clinical directives in relation to clinical issues, other suggested that the system used was not as comprehensive as it could be. In addition, some staff suggested that the level of engagement with the workforce in relation to some of the decision-making could be improved, and that such a step would benefit the degree of implementation of directives in practice.

Managing performance

Clinical supervision of practitioners in the National Ambulance Service is limited in nature and largely confined to formal oversight during initial training. There is currently no mechanism in the Service for ongoing clinical supervision post-qualification, and the Service therefore largely relies on feedback from compliments and complaints, fitness to practise proceedings or from other downstream service providers, to act as a safety net should clinical performance fall short of the necessary standard.

The National Ambulance Service employs a grade of staff known as paramedic supervisors. It was reported that this grade provides a supervisory role at station level. However, their supervisory role is more operational than clinical, and the demands for providing cover on the ambulance roster means that these staff are not supernumerary (employed in addition to rostered staff as an extra resource) and are therefore not always in a position to actively supervise the provision of pre-hospital emergency care by other practitioners. The 24-hour seven-day (24/7) nature of an ambulance roster means that in some instances the level of interaction between rostered paramedic supervisors and staff on alternate shift patterns may in fact be relatively limited. There also does not appear to be a system of formal regular performance appraisal of clinical staff by their supervisors beyond the point of formal qualification.

It was evident during the review that National Ambulance Service clinical staff are highly committed to providing excellence in clinical care. Observation of the provision of care by a number of crews during the review indicated a very high standard of clinical care. However, the lack of ongoing clinical supervision and clinical audit in the service prevents the National Ambulance Service from demonstrating that excellence. In addition, the mechanisms for the detection of potentially poor practice are weak. This is of significant concern to the Authority as it prevents the effective execution of clinical governance in practice, and may not offer the level of protection to the public from poor practice that could lie undetected under current clinical governance arrangements.

Chapter 4 – National Ambulance Service Workforce

Introduction to workforce

As with any organisation involved with the provision of care, the workforce of the National Ambulance Service is its crucial resource and asset. A highly trained, motivated, and well organised complement of staff is vital to ensure that patients receive the high-quality pre-hospital emergency care that they deserve. Furthermore, the National Ambulance Service has a duty to ensure that the environment and structures that it puts in place to support its staff are designed to enable them to develop to their full potential, and provide excellent care to patients as a matter of routine.

Both nationally and internationally, more and more clinical care is being provided to patients at the point of first contact. The ability of pre-hospital emergency care providers to progress their service for the benefit of patients is largely driven by the service model which includes strong workforce planning and staff competency enhancement and development.

Findings

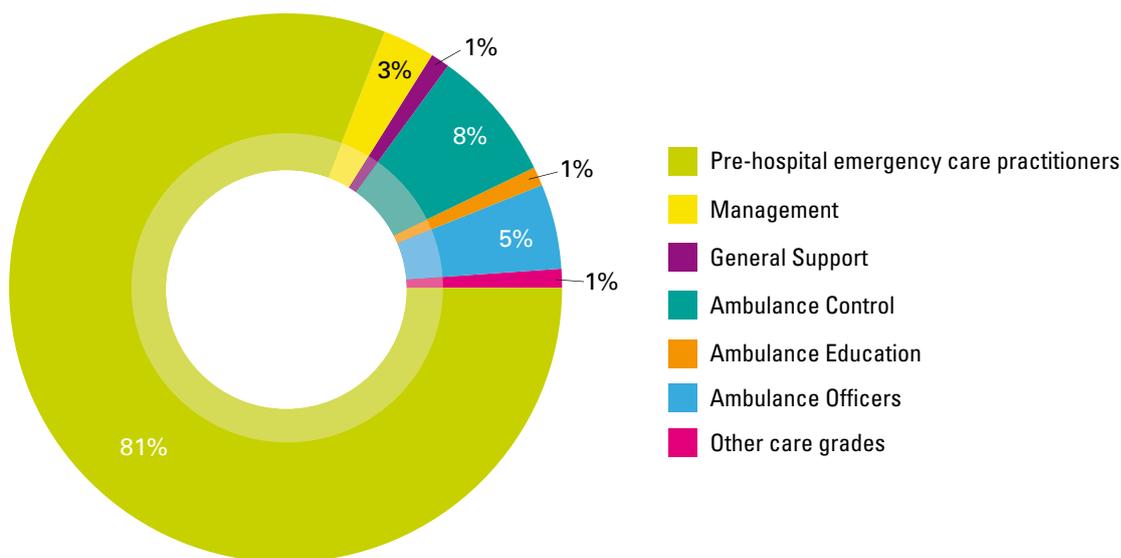
Current staffing levels

The National Ambulance Service workforce numbered 1,608 whole-time equivalents as of August 2014, which is below the agreed staff ceiling of 1,645 whole-time equivalents. It was reported to the Authority at interview by the Chief Operating Officer/Deputy Director General that the recruitment embargo in place across the health service did not apply to National Ambulance Service front-line staff. Figure 3 shows the breakdown of staff figures within the National Ambulance Service.

The majority of staff in the National Ambulance Service work as part of the complement of emergency medicine technicians (EMTs), paramedics and advanced paramedics who act as ambulance crew in the provision of pre-hospital emergency care. Each grade of clinical staff from EMT to advanced paramedic is trained and provided with credentials to provide an ever greater array of interventions and treatments for conditions. An increase in the complement of paramedics and advanced paramedics relative to EMTs over the past decade has increased the overall workforce clinical capability and the Service's capacity to respond to pre-hospital emergency care calls. It should be noted that many of the management grades are also registered practitioners who may on occasion contribute to the response of emergency calls.

Of note, the National Ambulance Service had at the time of this review recently employed a new grade of staff, intermediate care operatives, who have been recruited to operate intermediate care vehicles. These staff are trained by the Service to EMT level, and as of August 2014 they accounted for 116 staff, or 7.2% of the total workforce.

Figure 3. The Percentage Breakdown of Staff Grade Employed by the National Ambulance Service



Strategic workforce planning

The Authority explored the National Ambulance Service's strategic, business and operational workforce planning arrangements. In January 2013, the National Ambulance Service officially approved an internal Human Resources and Organisational Development Strategy to provide an overarching plan for workforce development for the years 2013 through to 2018.

This document identified a number of high-level objectives for this five-year period which included:

- successfully moving to a new governance structure
- harnessing external HR knowledge to facilitate and develop internal expertise
- determining workforce requirements to deliver national standards
- cooperating on an ongoing basis with the HSE National Recruitment Service to assist in meeting the needs of service users.

This strategy document also introduced the concept of a generic competency framework for all staff, both clinical and non-clinical.

Effective workforce planning for a body such as the National Ambulance Service requires the execution of a medium- to long-term vision. The presence of such a strategy document is therefore a welcome development. The strategy clearly outlines the challenges faced by the Service as of early 2013 in acting to centralise the existing fragmented regional functions. However, the strategy lacks detail with respect to the specific workforce resources required to support the Service's overall strategic vision. It also does not outline what will be required at the very least to maintain the existing state of affairs in relation to staff numbers and cumulative competency in what it anticipates will be resource-limited circumstances.

It is notable that the strategy outlines as a critical priority the need to actually determine workforce requirements to deliver national standards. This further highlights the relatively underdeveloped approach to workforce planning in the Service that had happened up to that time point. It is possible that the overall lack of detail beyond general principles in the document may have been influenced by a lack of necessary internal workforce information required to make informed staffing projections.

In 2013, the Director of the National Ambulance Service appointed an internal manager for human resources (HR) who was recruited from within the Ambulance Service. The post-holder is part of the National Ambulance Service's Leadership Team. Prior to his appointment, personnel management was decentralised and practices were described as divergent and fragmented across the operational areas. There was evidence that since his appointment, significant progress has been made to centralise the HR function, ensuring consistency in HR messaging, industrial relations, reducing staff absenteeism levels and the adoption of an incremental approach to ensuring uniformity in staff rostering practices.

It was explained to the Authority that this process remains fundamentally hindered by the intrinsic lack of information to determine the optimum number of staff required and where they should be located in order to meet current and future service demands. Staff interviewed identified that the commissioned capacity review would inform these matters. However, as identified elsewhere in this report, the Authority is very concerned that in the absence of an aligned process to critically examine the current service model, there is a risk that an isolated capacity review may further compound existing service model deficits.

Operational workforce planning

While there had been a recruitment drive to increase the number of call-takers and dispatchers, the Authority identified that the current rate of recruitment and training for new entrant paramedics had declined to a point where, within the current service model, it has not kept pace with demand.

It was explained to the Authority that the historical natural attrition rate for paramedics in the service through retirement or resignation stood at 40 to 50 paramedics per year. However, in 2013 the National Ambulance Service recruited only nine paramedic trainees and only 12 in 2014.

This was further explored by the Review Team with staff, who explained that the National Ambulance Service, as part of the wider HSE, is subject to the same HR national policies and structures. In addition, control over the recruitment process for new staff is exercised centrally by the HSE rather than internally by the Service itself. It should be noted that the National Ambulance Service internally trains the majority of its paramedical staff on recruitment. It takes two years from entry to the Service to train a paramedic, and this therefore reduces its ability to rapidly fill rosters when a decision to recruit has been made. Such inflexibility is further compounded by any external time lag that may occur in the recruitment process from the point in time when a decision to recruit is made until people take up their posts and begin training.

While acknowledging the staff vacancy level and its impact on operational services, the National Ambulance Service reported limited flexibility in applying the national HSE recruitment process to address its deficit, and therefore addressing the resultant risk in maintaining safe service delivery levels. In addition, senior staff highlighted that considerable work to identify immediate staff and skill mix requirements had been undertaken in 2012 and 2013. As part of the documentation request process, the Authority was provided with the National Ambulance Service section of the proposed HSE National Service Plan for 2013. This was marked as draft but had been internally approved for submission by the then National Ambulance Service Director on 12 July 2012.

This document clearly outlined a request for recruitment of staff to enable the delivery of a number of the Service's objectives variously discussed in this report. This included call-taking and dispatch staff, advanced paramedics and clinical supervisory positions. The final published version of the 2013 service plan⁽³⁵⁾ did not include sanction for the majority these staff, and of the requested resources, only a portion of the control-centre staff identified as being required had, for example, been employed by the time of the Authority's review.

It is acknowledged that the document outlined above was in draft format. However, based on the findings of this review, the staffing numbers requested to safely introduce many of these developments does not appear to be unrealistic.

Staff training and development

Improving the clinical capacity of the service, and the National Ambulance Service College

Significant progress has been made since 1993 when the Report of the Review Group of the Ambulance Service⁽⁷⁾ first identified that there was considerable potential for upskilling of ambulance personnel to improve the scope of pre-hospital emergency care services for patients. The Strategic Review of the Ambulance Service published in 2001⁽³⁶⁾ outlined some progress, with a desired trajectory of movement towards a service provided by at least two EMT-trained crew members per ambulance, with this having been achieved across 65% of ambulance crews by that time.

In response to this need, the National Ambulance Service extensively developed the clinical competency of its workforce through an evolving process of education and training. This was significantly aided by PHECC setting standards and formalising the scope of practice clinical staff. At the time of this review, the vast majority of staff working in ambulance crews are trained to paramedic level, with a further 24% of staff additionally trained to advanced paramedic level. Much of this progress in upskilling was made in the 10-year period from 2001 to 2011.

The infrastructure in place to support this programme of formal education and training of practitioners is driven by the National Ambulance Service College. This college provides an extensive programme of education and training for the diverse group of staff required to contribute to the running of a modern ambulance service. The training provided is highly valued by frontline staff and is of a high calibre. It is led by the National Ambulance Service Head of Education and Competency Assurance, who is a member of the National Ambulance Service Leadership Team.

This senior manager is supported in his role by an education manager and a competency assurance manager. These managers oversee the work of a team of 17 education and competency assurance officers, most of whom are based regionally across the country, and are tasked with coordinating and providing ongoing training and education for National Ambulance Service staff. Their role also includes identifying staff training needs, participating in adverse clinical incident reviews, coordinating clinical placements, liaising with area medical officers, and assessing practitioners' clinical competency. The training college is both accredited by PHECC and contributes to the functioning of PHECC through staff input into PHECC committees for the purpose of technical advice. The college works in partnership with the School of Medicine and Health Science at University College Dublin, to provide EMT, paramedic and advanced paramedic qualifications. At the time of this review, the college had capacity to regularly train 96 new paramedics, and 48 advanced paramedics per annum.

However, it was reported at interview, and seen in documentation reviewed, that the pace of development and training of staff has slowed significantly over the past three to four years. This is further compounded by the limited and slow rate of recruitment of new paramedics, which has not kept pace with the replacement rate.

Advanced paramedic numbers

International best practice suggests that better outcomes for some patients will be achieved through the deployment of a timely advanced paramedic resource. As a result, all ECHO and DELTA calls – and some other calls as designated by Advanced Medical Priority Dispatch System coding – are recommended to routinely receive an advanced paramedic response.

Advanced paramedic numbers in the National Ambulance Service have grown over the past decade and now account for approximately 24% of all practitioners in the service. This has been a positive development for patients as it allows a higher level of care to be received by more patients at first contact with the health service.

Despite these positive changes, the Service still cannot achieve the necessary levels of advanced paramedic response by the Advanced Medical Priority Dispatch System code which should be achieved as a matter of routine. It is the Authority's view that the current number of advanced paramedics should be reviewed with an ultimate aim to provide the additional clinical capacity to achieve best practice for all patients. To facilitate this, the National Ambulance Service should be supported in upskilling more of the current workforce to enable it to provide a more comprehensive Advanced Life Support response to patients.

Paramedic and advanced paramedic training and mentoring

The National Ambulance Service trains paramedics in collaboration with University College Dublin. Final qualification provides the candidate with a Diploma in Emergency Medical Services.

It takes two years from enrolment to fully train a paramedic. Paramedics undergo a one-year period of supervised internship during their second year of training, which includes regular oversight and review meetings with a tutor. During this time, care is taken to ensure that they are partnered with an experienced paramedic to aid in their ongoing experiential development.

Advanced paramedics are trained in advanced life support (ALS). The advanced paramedic role was described to the Authority as one that demanded a greater burden of independent clinical decision-making than involved in the paramedic role. The training therefore focuses significantly on developing these clinical judgment skills.

Training of paramedics and advanced paramedics by the National Ambulance Service College has evolved and developed over a number of years, and the service is effective in its approach to the clinical development of staff through these programmes. The ongoing effectiveness of this service in the provision of training for new and current staff has, however, been severely hampered in recent times due to non-recruitment of new staff and lack of availability of current staff for ongoing training. Failure to continue to train and maintain staffing levels runs the risk of undoing much of the progress made over the past decade. This needs to be reversed.

Call-taking and dispatch training and mentoring

The separated roles of call-taker and dispatcher are relatively new to the National Ambulance Service. Indeed, the National Ambulance Service College only began to centrally train call-takers in 2013 and it is anticipated that 47 call-takers will be trained by the College by the end of 2014. Similarly to other staff trained by the College, call-takers are provided with a combination of classroom training, placement, and supervised working prior to being fully sanctioned to independently take calls. The effective integration and training of these new staff will play an important role in determining the success or failure of the control centre reconfiguration project.

Management training

The current structures to develop and support managers in the National Ambulance Service remain underdeveloped.

The vast majority of managers and supervisors within the National Ambulance Service have risen from within the ranks of the front-line complement of operations and control staff. Given the technical nature of the Service, it is important that these staff have a good understanding of the functioning of the Service in order for them to effectively lead and manage it. Management training and development was explored at interview, and it is acknowledged by the National Ambulance Service, and in the Education and Competency and Assurance Plan 2012–2014 of the National Ambulance Service College, that there is a need for a greater emphasis on management training for staff across the service. Indeed, this plan identifies that the internal capability of the National Ambulance Service College to provide such management training is much less developed than its ability to provide clinical training. The plan identifies that external expertise from the wider HSE is required to facilitate this upskilling of staff.

During the course of this review, the Authority further explored the National Ambulance Service's approach to management and leadership development. The Review Team was informed by the National Ambulance Service College that provision has been made for management training by allocating specific training courses. However, attendance at many of these training courses has been variable, and many managers cited the ongoing demands of the job at hand as a major barrier to partaking in such training.

For an organisation such as the National Ambulance Service – which must continue to progress through a substantial change agenda – the capability of management will be critical to the achievement of the Service’s strategic objectives. Bringing about a stronger and embedded culture of performance achievement and management will also be dependent upon the skills and competencies of a management team that is supported and empowered to consistently push this agenda. The National Ambulance Service needs to review its current approach to management development, as more effective investment will yield significant benefits for the wider service and the public it services.

Performance management

Formal performance management of staff below leadership level after completion of initial training is relatively limited in the National Ambulance Service. The service avails of the HSE Performance Management System⁽³⁷⁾ as a framework for annual continuous performance review.

However, front-line staff spoken with reported that this system was not fully operationally embedded. Staff said feedback on performance was generally limited, and was hindered by the relative non-availability of supervisory staff due to their own involvement in front-line services. The lack of routine and formal performance reviews is not aligned with best practice and prevents an opportunity for two-way communication related to performance and development.

Workforce welfare

The National Ambulance Service’s workforce is its most valuable resource, and management of the ongoing welfare of staff should therefore be a critically important concern for management to enable sustainable high-quality performance. The provision of pre-hospital emergency care is extremely demanding on the staff who provide it.

It was noticeable throughout the Authority’s review that staff morale at all levels in the National Ambulance Service appeared to be very low. This was predominately attributed to perceived difficulty with working arrangements, continued adverse media coverage, poor communication across all grades of staff, and general frustration throughout the ranks in relation to their personal interpretation of management practices and decisions. The Service has also continued to move through a period of change which may have also contributed to this situation.

Best possible outcomes for patients will only be achieved through an effective reform programme which will require significant staff buy-in and involvement. It is crucial that both management and staff grades within the service act to foster a greater degree of constructive cooperation. Without this, the Authority believes that the necessary reforms that are required to improve conditions for both patients and staff will not be possible.

Staff absenteeism

In all workplaces, people miss work for a variety of reasons, many of which are legitimate, and others less so. Some of the common causes of absenteeism may include (but are not limited to) illness, bullying, harassment, burnout, stress, low morale, disengagement and occupational injuries.

Internationally, absenteeism rates amongst ambulance service providers are often found to be above the norm for healthcare workers⁽³⁸⁾, with some services reporting a regular absenteeism rate as high as 8%^(39;40). As part of the review, the Authority requested absenteeism rate data from the National Ambulance Service. Data provided up to February 2014 revealed that the absenteeism rate in the Service, while higher than that of other acute HSE healthcare services, has improved since 2011 from 6.29% to 5.59% in 2014.

Staff availability

Staff explained that historically, the National Ambulance Service has planned its workforce so as to allow for a 30% relief factor on rosters. This 30% has been calculated to facilitate annual leave cover, sick leave and in-service training in a setting where a finite number of staff are required to continually fill a roster. The non-filling of staff vacancies means that in some regions the staff relief factor has been reduced by up to 15%. Staff expressed significant concerns and frustration in relation to an increasing dependence upon overtime or the non-filling of some rosters (also known as dropped shifts) to account for this non-availability of staff.

The practice of on-call activation remains in place in some stations in counties Donegal, Sligo, Leitrim and Mayo. What this means is that an ambulance crew remains on call following completion of their day shift for a further possible 12-hour night shift. When this happens the on-call activation crew may be called upon, usually from home, to respond to a call should the rostered night shift staff be otherwise occupied. This practice has been repeatedly identified in numerous ambulance service reports to be suboptimal as it results in excessive staff working hours over the course of a weekly roster, and it can result in delay in responding to a call.

The reduction of staff numbers results in an over-reliance on overtime and dropped shifts. This reduces the capacity of service provision and, given its already demanding baseline workload, also runs the risk of staff burnout due to persistent overtime on 12-hour shifts. In addition, given the need to pay regular overtime to maintain the roster, the high financial cost associated with overtime payment needs to be weighed against the potential benefit of alternate investment of this money into staff recruitment, to reduce this need for overtime.

Critical incident stress management (CISM)

During the course of their duty, National Ambulance Service personnel will encounter potentially emotionally or psychologically distressing situations due to the nature of their work. While this may be unavoidable, it is very important that the Service has an effective means to systematically provide support for staff to ensure their ongoing psychological and emotional wellbeing.

The National Ambulance Service has acted to address this need through the establishment of a comprehensive infrastructure to deal with critical incident stress management. Staff reported that they receive stress awareness training, and this is also integrated into the new entrant paramedic training programme. In addition, the service has a system in place of trained peer support workers, who act as a point of contact for their colleagues in the handling of the aftermath of distressing incidents. Ready access to registered mental health professionals is also provided. Interviews with staff revealed this system to be an effective means of support for those who require the service. The National Ambulance Service approach to dealing with this crucially important area of staff-welfare concern was found to be aligned with best practice and is a positive development.

Chapter 5 – Information systems and fleet management

Introduction to information systems, National Ambulance Service

The effective use of both information and information systems is central to the quality and safety of any ambulance service. Information and communications technology (ICT) needs to be fit for purpose to enable effective and efficient coordination of emergency call handling and response dispatch. ICT also has a critical role to play in ensuring that information to promote quality and safety – and to inform decision-making and direction in pre-hospital emergency care settings – is available when required.

The information communication technology infrastructure required to support both control centres and operations in providing a pre-hospital emergency response service requires a number of different interrelated pieces of technology to be used collectively to enable an effective timely response. The centrepiece of the technology infrastructure is the computer-aided dispatch system which records all of the call-related details. This system is linked in with four other systems which each perform interrelated but separate functions:

- a gazetteer (a computerised dropdown geographic dictionary, linked to an electronic map which is used to locate the incident)
- the radio and telephony system
- an automated vehicle location system
- a mobile data terminal, which can be used to send information to crews in text form independently from the radio and telephony system.

The following section describes the information communication technology systems in use by the National Ambulance Service, including the five systems listed above, at the time of this review.

Computer-aided dispatch – incident tracking system

The National Ambulance Service uses a computer-aided dispatch system to coordinate its emergency response to all emergency calls, including the call-taking, dispatching and reporting processes for all incidents.

Before fully implementing the control centre reconfiguration project which will use the MIS C3 CAD system, it was identified at the time of this review that there were three different computer-aided dispatch systems in use. Ballyshannon and Castlebar control centres used a Fourtech computer-aided dispatch system. Wexford and Tullamore used MIS C3, and Limerick and Townsend Street used MIS Alert 2000.

These systems were not integrated, which meant that from an ambulance deployment perspective, the National Ambulance Service continued to operate as six different services within defined geographical areas. There was limited awareness of the availability of ambulance resources from outside the geographically defined areas. This lack of integration and service oversight potentially meant that best possible use of available ambulance resources was not guaranteed.

This issue was also identified in the Dublin area where there are two separate control centres, one operated by the National Ambulance Service and the second by Dublin Fire Brigade. Both of these centres operate from the same room located within the same building in Townsend Street, with the Dublin Fire Brigade automatically receiving calls for the majority of county Dublin, and transferring a portion of these to the National Ambulance Service over the phone as required based upon either the geographic location of the call or lack of Fire Brigade ambulance availability to respond to the call itself.

Despite this interdependency in providing response to calls, there is no interaction between the two computer-aided dispatch systems used by either service, with the Dublin Fire Brigade using a STORM system and the National Ambulance Service using an MIS system. This means that calls cannot be passed electronically between the two differing computer-aided dispatch systems. Therefore each entity (that is, the National Ambulance Service and Dublin Fire Brigade) only has oversight of their own available emergency resources. Not surprisingly, as was subsequently reported both at interview and with control staff that the Authority spoke with during focus groups, this means that the closest ambulance available resource to an incident or call is not always immediately dispatched on a regular basis to the public in Dublin. What this means is that on occasion there can be potentially avoidable delays in reaching emergency calls. If there was a coordinated approach, this potential risk would be mitigated and as a consequence response times in the Dublin area would improve.

The Authority further explored why this risk had been allowed to continue. Staff reported that following recommendations made in the 2007 Review of Ambulance Services, a working group which consisted of the Director of the National Ambulance Service, the Chief Fire Officer from Dublin Fire Brigade and senior managers from both organisations was convened. The purpose of this working group was to identify areas to increase efficiencies between both the National Ambulance Service and Dublin Fire Brigade. This included the development of a joint dispatch desk for the Dublin area to coordinate emergency responses and obtain the best use of resources.

However, the Review Team identified through a review of documentation and through interviews that this working group had been ineffective. Both services have tried to mitigate the risk by agreeing a procedure to guide staff on how to make and receive requests for assistance.

Nonetheless, through observation, review of the supporting data and interviews, the Authority's Review Team concluded that the benefits of this approach are limited. In addition, and of great concern to the Review Team, there was evidence showing that repeated attempts had been unsuccessfully made by the two service providers to set up a joint dispatch desk. More worryingly, at the time of this review, there was no definite plan available to Dublin Fire Brigade to outline what arrangements and controls would be put in place to mitigate the risk when the National Ambulance Service control centre moves from Townsend Street to the new National Ambulance Service control centre in Tallaght, Co Dublin, in early 2015. The current risk that these arrangements pose to patients, the tangible failure to actively mitigate the risk, and the evidence of a lack of meaningful engagement in managing this risk between these two public services is of significant concern to the Authority. The National Ambulance Service and Dublin Fire Brigade must make immediate efforts at senior leadership level to ensure an integrated ambulance service.

The Authority acknowledges that the incremental move towards a national control centre using a single computer-aided dispatch system – which is the latest version of the current MIS C3 system already in use in two of the six control centres – will, if managed and monitored effectively, eliminate many of the risks identified. However, it was identified that in the interim, no measures have been taken during the project to ensure that the extraction of data from each of the systems in the six centres is consistently collated and used to inform continuous improvement. This and other performance issues will be further explored in Chapter 6 of this report.

Emergency response resource location

An automated vehicle location system (AVLS) is a system that is used by the National Ambulance Service ambulance control to track emergency vehicles (ambulances, emergency response cars and officer cars) in real time as they move around the country. All its vehicles are fitted with a global positioning satellite system that transmits its position. This real-time travel information is displayed on a map within each control centre. In turn, this allows control centre staff to remotely track the fleet so they are aware of ambulance locations relative to an incident, and to allow dispatch of the nearest available resource. AVLS is used by all six National Ambulance Service control centres and each one is integrated to the specific computer-aided dispatch being used at each centre.

However, as reported in the previous section, the computer-aided dispatch systems used at the time of this review were not integrated and as a result oversight of available resources is limited to the fleet assigned to the different control centres. This means there is potential for delays in responding to emergency calls. However, this potential risk has been recognised by the National Ambulance Service and is one of the catalysts for moving from six control centres to one centre over two sites. The Authority is in agreement that if introduced effectively, this will provide better oversight and more efficient use of resources.

In the absence of such oversight and until ambulance control reconfiguration happens, the National Ambulance Service should consider a direct TETRA radio link* between dispatchers in all control centres to check resource availability for calls considered to be closer to another geographically controlled area. The use of radio as opposed to telephone would potentially reduce the time taken to coordinate the nearest resource and allocate an emergency vehicle to the incident.

Incident address verification

A gazetteer is a geographical dictionary or directory used in conjunction with maps to assist control-centre call-takers in locating the incident from the address and description given by the person making the telephone call to them.

Content of a gazetteer can include a subject's location, road networks, mountains, peaks and waterways. Gazetteers need to be kept up to date and inputted from one central point. The data used in the National Ambulance Service gazetteer is taken from the An Post (Irish postal service) dataset. Timely verification of the incident address is an important factor in the timely dispatch of an emergency resource particularly in the instance of life-threatening ECHO and or DELTA incidents.

Staff interviewed highlighted a particular challenge in the widespread use of townland (small geographical areas of land) addresses and the lack of designated postal codes. It was reported at both the focus groups and on site that the most time-consuming element of call-taking is address verification especially in relation to rural addresses. These townlands are mostly used in rural settings, and are particularly confusing to call-takers located elsewhere who have no local geographical knowledge. Calls observed by the Review Team showed that locating rural addresses is time-consuming and management within the control centres have acknowledged this as an issue. In addition, review of data for one call showed a seven-minute delay before the incident location was identified.

However, though the National Ambulance Service staff acknowledged the problem and associated risk, there was no evidence to suggest that any formal measures were being taken by the Service to (a) quantify the problem and (b) address the problem, particularly in enhancing current support and training for call-takers.

* The National Digital Radio Service is a purpose-built secure digital mobile radio network owned and managed by TETRA Ireland in the areas of security, fire and safety, healthcare, Government and public service agencies.

Satellite navigation systems used by emergency response personnel

The National Ambulance Service did not use a satellite navigation (satnav) system at the time of this review. Throughout the review process, some of its staff reported using their own personal satnav systems, and this was also observed by the Review Team when shadowing some crews.

While it is part of the dispatcher function to provide directions to an incident, it was reported at focus groups by front-line staff that dispatch staff are sometimes too busy to provide detailed directions. Furthermore, it was explained that given the larger distances that crews now cover relative to historical norms, paramedic crews are now often operating in areas that they are unfamiliar with. In addition, greater use of hospital bypass protocols results in many crews taking patients to more distant tertiary hospitals in urban centres. On arrival at these centres, the crew become available to answer calls on turnaround from the hospital, and should a call be allocated to them immediately on turnaround, navigation in unfamiliar urban areas has become more challenging for staff less familiar with those settings.

While it is the intention of the National Ambulance Service to implement Emergency Vehicle Grade satellite navigations systems, there were no firm timelines for this at the time of this review. It is recommended that the Service develops a firm plan around the introduction of satnav technology to be used alongside other more traditional means of navigation to aid crews in their work.

Communication between control centres and emergency response staff

A two-way radio system allows for the issuing of calls to the emergency response crew and or personnel, and can allow the crew to pass information back to control centres. While the National Ambulance Service is moving to a single integrated command and control model, it still operates both a newer digital and older analogue radio system. Most recently, the Service has moved from the traditional analogue sets, which can be monitored externally, to a more secure TETRA digital system.

It was reported at focus groups that the TETRA system was being implemented nationally, but at the time of this review not all personnel has received training on the system. Possibly as a consequence of this, the Review Team observed staff continuing to dispatch over the phone, when they had access to the TETRA system. This practice of using the phone adds to the time it takes to mobilise a resource which will impact on the timely dispatch of emergency resources for patients – this practice should be addressed.

Operational ambulance staff use their radios to send status messages relating to various time-stamps of an emergency call. These status time-stamps provide the times that the crew:

- went mobile to a call
- arrived at an incident
- left the incident scene and travelled to hospital
- arrived at hospital
- were clear of patient at hospital and are made ready for a new call.

These times are extremely important and are interfaced to the computer-aided dispatch and recorded there for a variety of reasons, including extraction of performance data and for investigations that may be required.

If for whatever reason a time-stamp is missing on a call, for example if a crew forget to send a specific status time, or there is poor radio connectivity in certain areas, control staff should speak with the crew and get a confirmed time in relation to the missing status. This time is then inputted into the call on the computer-aided dispatch system using what is known as the 'FILL' mode and is identified when reviewing the sequence of events on those calls.

However, during an on-site visit to one control centre, the Authority's Review Team were advised that in some instances unconfirmed times in relation to the time-stamp status of some calls were being inputted using the 'FILL' mode at that centre. This issue was highlighted by the Review Team to local management as a risk for mitigation at the time of the visit. The Authority recommend that the National Ambulance Service review this potential for error and make recommendation that all control staff are made aware of the importance of the need for accuracy when using the 'FILL' mode. The 'FILL' mode should always only be used when a member of the crew confirms the missing times.

Mobile data terminals

Mobile data terminals function instead of or alongside the two-way radio and can be used to:

- pass details of calls to the crew
- log the time the crew was dispatched to a patient
- log the time they arrived at and subsequently left the scene.

In addition, details of the incident type and directions to the incident can also be provided. Modern mobile data terminals are usually directly linked to and automatically feed a satnav system. This can be used instead of providing incident directions over the radio system, which also requires front-line staff to write the directions down, and then transcribe them into the satnav.

As details of patient incidents are passed as data, use of mobile data terminals provides a more secure, rapid and reliable way of transmission between ambulance crews and ambulance control.

At the time of the review, mobile data terminals are only in use in the northeastern area of the National Ambulance Service, but these are not linked to a satellite navigation system.

Patient care report

Apart from the computer-aided dispatch system, patient-related information is recorded using predominately paper-based systems. The main form is the 'Patient Care Report' a standardised paper form developed in conjunction with the Pre-Hospital Emergency Care Council (PHECC) for all pre-hospital emergency care services including Dublin Fire Brigade.

The top copy of this form accompanies the patient on transfer to hospital, and a carbon copy is retained by the National Ambulance Service for its records. It was reported at interview by the Medical Director and reflected in the draft National Ambulance Service 2014–2016 Strategy that the long-term plan is to implement an electronic patient care record.

National Ambulance Service – fleet management

Introduction

Providing pre-hospital emergency care services depends on a safe, effective, reliable fleet that is designed and resourced to meet the changing dynamics and requirements of a modern ambulance service. The ambulance fleet is perhaps the most important of the organisation's physical assets. The vehicles within the fleet (which includes ambulances, emergency response cars and officer cars) are the workplace for the staff. They house sophisticated pieces of medical equipment and should provide a caring clinical environment for patients.

An ambulance fleet should support the service's operational models and it is critical that a fleet strategy supports any operational plan or model.

The strategy should also include a vehicle replacement programme that delivers a modern, well maintained fleet that allows fleet maintenance costs to be controlled and avoids the need to invest significantly in the high running costs of retaining older vehicles. Furthermore, the fleet size should be based upon core operational service requirements and should include a pool resource required to provide continuity of service when vehicles are off the road for maintenance, servicing and breakdowns.

It is expected that the findings and the recommendation of the capacity review commissioned by the HSE will address the current and future fleet requirements. At the time of this review this report was not available.

This section of the report outlines the findings of the Authority in relation to fleet arrangements in place within the National Ambulance Service at the time of this review.

Findings

During this review, the National Ambulance Service said it had 453 front-line emergency response vehicles in its fleet across the country. These are deployed from 100 National Ambulance Service stations nationwide. Each station is aligned to a control centre.

The 453 front-line emergency response vehicles include:

- 266 emergency ambulances (EA)
- 57 HSE National Ambulance Service rapid response vehicles (RRV)
- 70 officer response vehicles (ORV)
- 54 intermediate care vehicles (ICV).

In addition, there are six emergency response motorcycles which are driven by either advanced paramedics or paramedics. The different categories of emergency response vehicles are outlined here.

Emergency ambulances (EA)

An emergency ambulance is designed and equipped by ambulance providers to respond to and, if required, transport patients who require emergency medical treatment to a designated treatment centre. They are manned by two trained paramedic staff capable of providing pre-hospital emergency care and treatment to the public.

Rapid response vehicles (RRV)

A RRV is usually a car or SUV and is a means of providing an immediate fast initial response to a medical emergency or trauma. It is a recognised method of delivering early clinical intervention. It is manned by a single trained paramedic or advanced paramedic and is equipped with medical equipment to provide stabilisation to a patient in a life-threatening condition and to prepare the patient for onward transportation to a treatment centre by an emergency ambulance.

Officer response vehicles (ORV)

An ORV is a fully equipped car or SUV used by ambulance officers which can, if made available for emergency response, be used like a rapid response vehicle for initial fast response to an emergency. It was observed by the Authority during the review that they are also regularly used by officers to travel around their geographic area of responsibility in undertaking their role.

Intermediate care vehicles (ICV)

An intermediate care vehicle is an ambulance used to transport less acutely ill patients, usually between care or treatment centres. They do not have the same level of equipment as emergency ambulances and they transport patients who are not emergency cases between healthcare facilities. Use of these vehicles frees up emergency ambulance resources to make them more readily available for response to emergency and or urgent calls. On occasion, intermediate care vehicles may also be deployed by control centres to provide a first response if they are available and in transit near the scene of an incident. In this situation they are not, however, mandated to transport the patient to hospital, and an emergency ambulance also needs to be deployed to the scene.

In addition, the Aviation, Maritime and Special Operations Section (AMSOS) of the National Ambulance Service are provided by:

- Emergency Aero-Medical Services
- Irish Coast Guard
- Air Ambulance Transfer Service.

These services fall out of the scope of the Authority's review.

Fleet procurement and replacement

A fleet and logistic manager who is a member of the Leadership Team is responsible for the national procurement of the fleet. This procurement process is managed in line with the national procurement legislation, regulations and HSE corporate processes. It was outlined at interview that once a fleet resource is purchased, then it is the responsibility of operational management to manage and maintain the fleet.

Vehicle replacement programme

It was reported at interview and in the documentation received that there is a vehicle replacement programme in use in the National Ambulance Service. A replacement happens when a vehicle is over seven years old and or has reached mileage greater than 500,000 kilometres. The Authority was told that replacements are carried out in three ways:

- **Option 1:** Engine replacement – where only the engine is replaced.
- **Option 2:** Cab chassis and engine replacement, where a brand new vehicle chassis is purchased, and the ambulance pod from an old ambulance is reconditioned and added to the new chassis. This is referred to by the National Ambulance Service as Demount/Remount.
- **Option 3:** Full replacement where the whole ambulance is decommissioned.

The National Ambulance Service replacement policy is in line with other ambulance services, for example in Britain, where Review Team benchmarking against three

services revealed a consistent policy of fleet replacement once a vehicle has been in use for seven years, but with no associated mileage restriction. However, it should be noted that much of the mileage accumulated by emergency ambulances in Ireland is achieved over relatively poor rural roads at high speed. While engines and other vehicle parts can be replaced as needed, cumulatively this level of usage will take its toll over time, especially in terms of the relative ongoing reliability of the fleet.

The National Ambulance Service submitted data to the Authority showing the registration date of its 266 emergency ambulances. This showed that 18% of the current fleet (47 vehicles) are eight or more years old. This was explored with the National Ambulance Service, who subsequently reported that by the end of 2014 the replacement plan, using Option 2 as outlined above, will provide 35 new emergency ambulances and two new neo-natal response vehicles. This will leave a further 23 emergency ambulances that require full vehicle replacement. However, it was reported at interview that the current vehicle replacement programme is already running two years behind schedule. This is of concern to the Authority given that providing pre-hospital emergency care services depends on a safe, effective, reliable fleet that is designed and resourced to meet demanding conditions. The Authority also notes that the fleet is currently operating with 74 emergency ambulances which were registered in 2007, and are therefore in the process of crossing the seven-year age threshold for replacement as 2014 progresses. This accounts for a further 28% of the fleet which, in accordance with National Ambulance Service policy will need replacement in the coming months.

Maintenance arrangements

The National Ambulance Service has a fleet management information system in place which provides real-time individual vehicle oversight and – which it is intended – will over time provide total fleet oversight. At the time of the review, it was reported that 144 of the 226 emergency ambulance vehicles are loaded onto the information system.

It was reported that all National Ambulance Service vehicles are Department of the Environment (DOE) certified and undergo regular servicing in line with each manufacturer's specifications, that is to say after 20,000 kilometres.

The Authority reviewed the Service's Fleet Management and Procedure Policy which clearly identifies the roles, responsibilities, procedures and audit mechanisms to ensure fleet reliability. In addition, there is a procedure outlining the daily inspection and inventory check which applies to all National Ambulance Service staff while operating any vehicle. Each procedure outlined the roles of supervisors and ambulance managers in monitoring compliance by staff. This includes the completion of a daily vehicle pre-shift inspection form.

The Authority explored these arrangements at individual interview, focus groups and during on-site observation.

Staff repeatedly identified an increase in emergency ambulance breakdowns which they perceived to be due to a reduction in fleet investment, which has resulted in an increase in the cumulative age of the overall fleet of emergency ambulances.

The Review Team identified during an on-site visit to stations in the southern area, that there were four emergency vehicles in Co Tipperary and three emergency vehicles in Co Wexford not in use on the day in question. Staff reported that these vehicles had broken down and were consequently out of service. They reported that other emergency crews were being used to transport staff from one station to another to collect spare ambulances for use, resulting in a potential reduction of resource capacity by nearly 50% on that specific occasion. This issue was highlighted to senior management by the Review Team on the day in question. The National Ambulance Service acted to mitigate this issue through the movement of spare ambulances to the areas in need.

Control and operational staff also advised the Review Team that frequently, staff who were starting a shift had no vehicle for periods of time because the crew due to finish were still out on a call. At the same time there was no spare vehicle available at their station for the crew coming on duty to use.

The Authority explored the current fleet maintenance arrangements with senior staff. They reported that until the fleet management system is fully operational, there was no central reporting of vehicle breakdowns. As a result, there is no real-time leadership overview and oversight of fleet maintenance. In addition, senior staff highlighted inherent fleet-associated risks particularly relating to the limited availability of vehicle maintenance teams. Other risks identified by senior staff included the lack of a centralised fleet maintenance programme, a lack of routine preventative safety checks, conducted by maintenance staff outside of routine services, and the poor garage infrastructure to support fleet parking and maintenance.

Making sure that its fleet is well maintained and continually upgraded is a key component part of any ambulance service's function in ensuring a reliable, high-quality response for patients. It is accepted internationally that continuous fleet investment, and having better facilities and access to vehicle fleet maintenance, complements and improves vehicle availability and reduces ambulance crew downtime, and any associated reduction in resource capacity. Given the totality of the information provided to the Review Team, and notwithstanding the processes that are in place to manage the fleet, it is the Authority's view that the age of many of the vehicles that remain in use by the Service increases the inherent risk of ambulance breakdown compared to that which might be expected with a younger fleet. Reports of a slowdown in investment in the fleet replacement programme are of concern to the Authority, because a lack of ongoing investment increases the probability of breakdown impacting on patient care in an emergency situation. The National Ambulance Service needs to act to mitigate this risk in the short term.

Chapter 6 – Quality monitoring and performance

The National Ambulance Service needs effective assurance mechanisms to measure its performance, to both recognise when it is performing well and to identify when and where it needs to improve. Quality management and improvement are data driven. Most organisations have limited resources, and they therefore may not be able to collect data to monitor every area that they want to analyse. Thus, as with all organisations, the National Ambulance Service must choose what processes and outcomes to monitor, and which are the most important to its mission and to the quality and safety of its services. Monitoring should focus on those processes which represent a potentially high risk to patients, recur with high frequency, or are problem prone.

To effectively monitor these identified processes, the National Ambulance Service should have strong arrangements in place to determine how to organise the monitoring activities, how often to collect data and how to incorporate data collection into daily work processes.

Introduction to quality monitoring and performance, National Ambulance Service

Key performance indicators are specific and measurable elements of practice that can be used to assess and benchmark quality of care both internally or, over time, externally against other providers. They can be related to structure (healthcare environment), process (the way in which care is delivered) or outcome (the effects of care delivered).

Many jurisdictions have adopted response-time indicators with associated targets as a way of monitoring performance and driving improvement. In early 2011, in collaboration with key stakeholders, the Authority published the *Pre-hospital Emergency Care Key Performance Indicators for Emergency Response Times*. An updated version, which provided further clarification in relation to the technical aspects to each measure, was subsequently published in 2012.⁽⁴¹⁾ These were developed in conjunction with a pre-hospital emergency care expert advisory group and included a comprehensive review of international practices. The introduction of these indicators was intended as an initial step towards improved public reporting of ambulance service provider performance. While the Authority acted to facilitate the agreement and publication of these recommendations, the responsibility lay with the service providers themselves and the HSE to collate and publically report these indicators, and use them as an internal tool to drive improvement. In an international context, it was unusual that a body external to the ambulance service provider would act to facilitate the setting of performance indicators in this way.

In doing so, it was intended that this exercise would act as a foundation for both the National Ambulance Service and the Dublin Fire Brigade to develop over time a more refined, comprehensive and detailed suite of quality indicators aligned to both organisation and patient care needs.

The Clinical Status 1 key performance indicator for ECHO and DELTA calls (patients who are in cardiac or respiratory arrest; and patients with life-threatening conditions other than cardiac or respiratory arrest) set out to review timeliness of response by a first responder, which includes advanced paramedics, paramedics or community first responders in 7 minutes and 59 seconds or less in 75% of all cases. As part of the development of these indicators, the time points agreed by the advisory group leads were a 'clock start' time from the moment when the call has been prioritised with a dispatch code to a 'clock stop' time of when the first-responder resource arrives at the scene. This is slightly different to the time frame used in the UK. Therefore, direct comparison between the National Ambulance Service and those ambulance services which operate in UK countries and regions can only be done through the application of comparable case definitions of clock start and stop time to raw data.

It should be noted that in other jurisdictions, including the UK, when response time indicators were first introduced, there was also an accompanying increase in ambulance service resources to allow services to work towards meeting targets. Significantly, a comparable investment did not occur in Ireland following the introduction of response time key performance indicators.

Notwithstanding this issue, such indicators provide a valuable source of information on a critically important aspect of pre-hospital emergency care. There is strong evidence to support shorter response times providing life-saving benefit for patients who are in cardiac arrest⁽⁴²⁻⁴⁶⁾, breathing difficulties^(47;48), or have experienced a stroke^(46;49). Indeed, more recent evidence suggests a time of 5 minutes or less may be more appropriate for cardiac arrest. Evidence also suggests that a timely pre-hospital emergency response and transfer to an acute centre for other acute medical events, such as stroke or heart attack, will also improve patient outcomes^(29;31;50). Better outcomes may include a higher chance of survival, or a lower risk of long-term complications for those that do survive. For many other conditions, such as opiate overdose⁽⁵¹⁾, severe bleeding^(52;53) or certain childbirth complications, empiric evidence and common sense suggest that the faster a trained paramedic or advanced paramedic reaches the patient, the lower the chance of a fatal outcome.

Even when the published evidence base to support the benefits of a rapid response impacting on likelihood of survival for a particular condition may not be as strong, more rapid arrival to the incident will confer other benefits for patients. For example, in the case of a major trauma incident, the faster an advanced paramedic reaches the patient, the quicker the patient's immediate pain may be relieved with strong painkilling drugs.

For patients who have potential spinal injury, the faster paramedics arrive on scene, the faster the patient's spine may be supported and the less likely long-lasting damage may occur^(54;55). In patients with seizures, faster administration of anti-seizure medication can reduce the potential chance of permanent brain injury^(56;57).

It should be noted that in the vast majority of cases, emergency ambulance services are not misused by callers, and the need to call for an emergency ambulance may represent a crisis moment in the life of that caller, the patient or their family and friends. In that setting, the faster trained professional paramedical staff arrive on the scene to take control of the situation, the less distressing and more reassuring the situation is for those service users involved. It should also be recognised that even with the very best adherence to call-taking protocol by control centre staff, the grading of call severity is only as accurate as the information provided. There is always a chance that the call could be more severe than it immediately appears to be on initial categorisation, and routine rapid response may make the difference for some patients in achieving a better outcome, even if call categorisation suggests the incident is less severe than it turns out to be, through no fault of the call-taker. Rapid response to incidents is therefore a core component of quality for any ambulance service.

In Ireland, implementation of response-time indicators requires the measurement of all the time-based steps that make up a pre-hospital emergency response by including vital processes such as the:

- call-connection time
- time to allocation of an emergency resource
- mobilisation time
- time of arrival at scene
- transportation time
- time it takes for patient handover to emergency staff in an acute hospital.

The international approach to monitoring ambulance service performance

Crucially, while response time is one important factor in determining the quality of pre-hospital emergency care experienced by a patient, other factors also play an important role in ensuring that the best possible patient outcome is achieved. Ambulance services internationally are increasingly moving towards a quality monitoring approach which includes response times alongside a suite of additional structure, process and outcome measures^(58;59). A move towards a more extensive collection of quality measures by ambulance services aims to provide a more balanced approach to monitoring the performance of the service, and providing a focus for ongoing improvement efforts.

By way of example, the ambulance service provided by the National Health Service (NHS) in England publically reports against a suite of diverse quality indicators^(60;61;61;62). This includes system indicators, such as response times, call volume received or the number of calls requiring an emergency ambulance journey. Other system indicators focus on non-conveyance such as the proportion of calls resolved over the phone without the need for an ambulance, or the number where treat and discharge has occurred. NHS England has coupled these system indicators with clinical outcome indicators. These include rate of return of spontaneous circulation following bystander witnessed cardiac arrest with initial shockable rhythm; and cardiac arrest survival to discharge (which is reported approximately six months in arrears). In Scotland, the approach has been similar with use of response times alongside other types of indicator⁽⁶³⁾. As with England, return-of-spontaneous-circulation rates are measured. However, the service in Scotland is still working to allow it to reliably track survival to discharge following cardiac arrest. Of note, the ambulance services in Wales and Northern Ireland currently continue to focus exclusively on response times as their means of publically reported quality assurance.

Further afield, in the United States^(64;65), many emergency medicine service providers use a set of clinical performance indicators which focus on the process of care including correct drug administration and airways management. Common conditions for which performance is measured and benchmarked include the management of myocardial infarction (a heart attack), pulmonary oedema (fluid on the lungs), and breathing difficulty including asthma, epilepsy and trauma.

The Queensland Ambulance Service in Australia^(66;67) has worked to develop a clinical audit review tool to allow it to track variation in prescribed treatment and initiate review. This system informs the public reporting of various measures of service performance including patient care, staff welfare, service delivery (broadly response times) and value for money.

The approach to measuring the quality of an ambulance service's performance therefore continues to evolve, and as such, there is no one set way to undertake performance measurement. Ambulance services face their own unique challenges in responding to the needs of the patient population they serve. Therefore, the quality improvement agenda in each service will dictate what needs to be measured. It should again be noted that this was recognised at the time of publication of the *Pre-hospital Emergency Care Key Performance Indicators for Emergency Response Times*. Indeed, recommendation 6 in this document outlined a need for service providers themselves to work towards the introduction of clinical outcome measures to complement time based measures. This chapter describes the current approach adopted by the National Ambulance Service in Ireland to measure its own performance, and the use of data as a tool for management and improvement.

Findings

National Ambulance Service quality measurement and performance

Performance measurement at a corporate level in the National Ambulance Service remains in an early development phase relative to many advanced ambulance services internationally. Despite this, at the time of this review the Service had recently become involved with a number of significant clinical initiatives. These initiatives thus allow it to demonstrate its clinical performance in facilitating best practice in the treatment of certain key conditions. The Service can and should build upon these developments to improve its performance-management practices in the best interest of patients.

Clinical outcome performance measurement

The National Ambulance Service has formal representation on the HSE's national Clinical Care Programmes⁽⁶⁸⁾ for Acute Coronary Syndrome, Emergency Medicine and Retrieval and Transport Medicine. It has also formally collaborated with the Stroke, Paediatrics, Obstetrics, Epilepsy and Palliative Care Programmes.

From a clinical performance perspective, the National Ambulance Service has begun to monitor return of spontaneous circulation on arrival at the emergency department in bystander-witnessed out-of-hospital cardiac arrest (as per the Utstein criteria*) as a continuous clinical quality indicator. This is in keeping with many of its counterparts internationally. The service has set a target rate of 40% for return of spontaneous circulation⁽⁷⁰⁾, which means that it aims to achieve return of spontaneous circulation in a minimum of 40% of patients it attends to who had a witnessed cardiac arrest, and who comply with Utstein case definition criteria. The projected National Ambulance Service return-of-spontaneous-circulation rate for 2013 most recently reported at the time of this review was 39%, which is comparable with other jurisdictions.

In addition, in accordance with recommendations from the Taskforce on Sudden Cardiac Death in 2006⁽⁷¹⁾, an Irish Out-of-Hospital Cardiac Arrest Register⁽⁷²⁾ was established in November 2007, and achieved full national coverage in 2012. The Register records data on all emergency-medical-services-attended out-of-hospital cardiac arrests in Ireland. The National Ambulance Service is a central contributor to this initiative, and it uses the Register to track the rate of out-of-hospital cardiac arrest survival to discharge from hospital for cases attended by the Service. Out-of-hospital cardiac arrest survival rate to discharge from hospital is an internationally recognised high-quality indicator of emergency clinical care.

* The Utstein comparator group⁽⁶⁹⁾ are patients with cardiac arrest of presumed cardiac origin, where the arrest was bystander-witnessed, and the initial rhythm was ventricular fibrillation or ventricular tachycardia. Health services internationally measure performance in this subgroup of patients as it allows for a consistent definition of cases, and therefore enables more reliable benchmarking of performance.

While the eventual patient outcome is not entirely dependent upon ambulance service input, the critical role that ambulance services play in the early part of patient treatment has resulted in many services adopting this as a key measure of ongoing clinical performance.

International benchmarking of ambulance services using this measure should be approached with significant caution given the multifactorial nature of survival. Nonetheless, the Irish rate for survival for out-of-hospital cardiac arrest attended by an emergency medicine response is broadly in line with the international average, and is improving.

The development of the Out-of-Hospital Cardiac Arrest Register in Ireland and its application as a tool to aid in informing the enhancement of performance in health service management of this condition is a significant development. Indeed, it should be noted that the development of this scheme, through National Ambulance Service involvement, provides the service with much better visibility of performance in addressing this key condition than is available for many of its ambulance service counterparts in the UK.

The National Ambulance Service has also played a pivotal role in both the HSE's Acute Coronary Syndrome and Acute Stroke Clinical Care Programmes, and it is to the Service's credit that the relatively rapid introduction of these initiatives has happened through coordinated Ambulance Service involvement.

Acute Coronary Syndrome Clinical Care Programme

The Review Team found that the National Ambulance Service has had a crucial role in enabling better access to rapid diagnosis and transporting of patients to specialist centres for primary percutaneous coronary intervention (PPCI or stenting^{**}) in the required 90-minute window following onset of a heart attack (ST Elevation Myocardial Infarction or STEMI).

The extensive application of this intervention across a population of patients has been proven internationally to save lives, and National Ambulance Service involvement in the Acute Coronary Syndrome Clinical Care Programme has facilitated its routine introduction to Ireland.

This has been a significant progression in patient care, which – the Authority's review found – has been enabled by the National Ambulance Service working closely with acute hospitals. The HSE's 2014 key performance indicator target for this programme aims to achieve primary percutaneous coronary intervention (PPCI or stenting) in 75% of potentially eligible patients from a clinical perspective. A key potential barrier to access is the ambulance service's ability to transport the patient to a specialist centre within the required 90-minute time frame for stenting following the start of a heart attack.

** Using small mesh tubes to treat narrow or weak blood vessels carrying blood away from your heart to other parts of your body. See, <http://www.nhlbi.nih.gov/health/health-topics/topics/stents/>.

In recent years, the HSE has managed to exceed this target, with 82% of patients receiving stenting in the period of July 2012 to June 2013. This was an improvement on its performance from October 2011 to September 2012, when only 67% of relevant patients received stenting. This reflects high performance from the Ambulance Service in collaboration with other stakeholders.

Acute Stroke Clinical Care Programme

National Ambulance Service involvement in the national Stroke programme has effectively assisted in the introduction of more routine thrombolysis (breakdown of clots in blood vessels supplying the brain through use of medicines) for patients with occlusive stroke. Rapid thrombolysis both increases the chance of patient survival following a stroke, and reduces the potential impact of the stroke for survivors with respect to their ongoing quality of life. This requires the National Ambulance Service to rapidly identify and transfer possible stroke patients to specialist centres capable of providing thrombolysis within a required 60-minute time frame.

The development of additional clinical quality assurance measures

The National Ambulance Service is also currently working in collaboration with PHECC and the Paediatric Emergency Research Unit, National Children's Research Centre to develop a suite of over 100 clinical practice indicators from which to potentially assess the clinical performance of the Service across a number of domains. However, given the difficulties specifically identified during this review in relation to the lack of clinical audit, allied with weak information management systems and processes, National Ambulance Service leaders must prioritise which clinical practice indicators will be monitored. Prioritisation should also be accompanied with clearly aligned processes and accountability arrangements for each indicator, within a written National Ambulance Service quality management and improvement programme.

However, the Authority – through its review on-site in cardiac catheterisation laboratories – identified that there is potential for the service to more explicitly target the publically reported measure of heart attack and stroke internally in performance managing its service. To further complement these measures, ongoing monitoring of performance in certain areas – for example, the accuracy of paramedic diagnosis of heart attack via electrocardiogram (ECG) or the rapidity of transporting of patients to specialist centres through the coordination of road and air ambulance resources – provides an opportunity for the service to closely track, learn from and refine its approach over time.

Information provided to the Authority during the review indicated that the National Ambulance Service's performance in relation to these measures was generally good. Therefore, through cooperation with other agencies that collect such data, it would not be difficult for the Service to quickly establish a monitoring programme to both refine performance and to publically report on the good work it does in this field.

Response and deployment – performance measures

In simple terms, an ambulance service has two main functions: the accident and emergency paramedical function, and catering for the patient's transportation needs. In an emergency setting, and especially in the servicing of ECHO and DELTA calls which are the focus of this review, the speed of transportation also has a potential impact on the clinical outcome for the patient. For example, in the case of cardiac arrest, there is an approximate 7% to 10% decline in survival opportunity for every minute's delay in the time to shock a patient with a defibrillator⁽⁴⁴⁾.

Providing an appropriate and timely emergency response is contingent upon an efficient and accurate call-handling and patient treatment and transportation process. This encompasses accurate call categorisation, rapid ambulance dispatch and mobilisation, efficient transportation to the most appropriate centre to meet the patient's needs and timely patient handover on arrival to hospital.

An ambulance service's performance in the provision of this function is dictated by the overall capacity of the service in relation to ambulance crew resources and control-centre staffing, the efficiency of usage of the resources that are available, and the challenges presented by variation in demand and factors such as the rural or isolated location of incidents or other geographic challenges.

Location of ambulance stations

The location of ambulance stations in Ireland has been largely historical in nature, and most have been in place for a significant period of time. However, Ireland has undergone a period of extensive demographic change over the past 20 years, and when such change occurs it is the duty of ambulance services to ensure that their pattern of deployment of ambulance stations and resources match these changes.

While it was anticipated by the Review Team at the time of the Authority's review that the HSE's ongoing capacity review will explore this issue in a more systematic and detailed way, it is evident from interviews with senior staff that the West of Ireland in particular is especially poorly served by the current number and location of ambulance stations. This concern prompted a demand-analysis for this region to be carried out by PHECC in 2006⁽⁷³⁾ which identified a significant deficit in ambulances in the Mid-Connacht region. That PHECC report recommended that two new stations be developed in this part of the West of Ireland. Since then, three identified blackspot areas (Tuam, Co Galway; Mulranny, Co Mayo; and Loughglynn, Co Roscommon) have been repeatedly cited in reports and correspondence both internally and externally from the National Ambulance Service as being in need of resourcing.

The Authority explored the current resourcing arrangements in light of, and in the context of, this 2006 PHECC report through interviews and on-site visits. At the time of writing, the Service has built new stations in Tuam and Mulranny, and is in the final stages of building a station in Loughglynn.

However, the station infrastructure and capital investment has not been accompanied with funding for ambulance resources. At the time of this review, the new Mulranny station was not manned, and the new Tuam station was only intermittently resourced through movement of ambulance resources away from other stations in Co Galway for a number of hours every week. At the time of writing, there is no ambulance currently in operation in Loughglynn.

In the absence of properly resourcing these areas and assessing the situation and addressing any deficits throughout rural Ireland, neither the National Ambulance Service nor the populations living in these areas can expect the delivery of a timely service in accordance with national key performance indicators.

It is of significant concern to the Authority that despite the repeated highlighting of potential problem areas, and eight years on from a demand-analysis by PHECC which validated these concerns in respect of the West of Ireland, this potential risk to patient safety still remains unresolved.

Dynamic deployment, National Ambulance Service

Introduction to dynamic deployment

Ambulance control centre dispatch staff are typically assigned to oversee the work of 15 to 20 ambulance resources within a given geographic area for the duration of their shift. It is the dispatcher's role to balance the allocation of this resource during this time period to ensure rapid response, while at the same time ensuring adequate cover remains available across their geographic region to service the future needs of the population. This role requires an acute awareness of the geography, terrain, usual travel times, population density, historical demand for ambulance provision and local availability of acute services. The dispatch of any resource is therefore an active process as its utility has a knock-on effect on the availability of resources in that area when that resource is in use. This has become more of an issue in an Irish context in recent years, as bypass protocols for conditions such as heart attack and stroke mean that emergency ambulances may now travel further from their local base-station and local hospital for longer periods of time in delivering patients to specialist centres, such as larger urban hospitals.

In response to such issues, ambulance services internationally compensate for the ambulance resource in one area no longer being available. This is done through the tactical movement of other adjacent resources to cover for the non-availability of a local station-based ambulance on another or long-distance call out, in the event that a second or more calls are received from the same local area. This strategic movement of resources is orchestrated by the dispatcher for the area, and is a continuous process. Such an approach is known as dynamic deployment.

During the Authority's review, it was reported that dynamic deployment was in use nationwide. Therefore, the Authority looked at how this was being done. The Review Team found that the National Ambulance Service, in order to compensate for reduced resources in a given area, uses a localised deployment plan which describes a set of geographically-distributed ambulance stations, and the priorities of these stations. However, the Authority found that these plans are not informed by historical incident data, including demand, and do not take into account variance which affect travel time such as time of day, day of the week, or the weekend versus weekday. In addition, the predominant approach used does not fully utilise the dispatcher's experience, which could on occasion allow deployment decisions to be made with the benefit of staff experience. Furthermore, the Review Team observed a practice of deployment between ambulance stations as the only method of resource re-distribution in a region, rather than the use of tactical deployment points located away from stations. The Authority therefore concluded that dynamic deployment as described internationally is not currently in use nationwide, and has made recommendations accordingly. It is anticipated that the role for dynamic deployment in improving performance, as defined by the international understanding outlined above, will be further explored by the ongoing capacity review.

The need for more community first responder schemes

The review of the National Ambulance Service's current response times, and analysis of the current distribution of resources, reveals that in many areas, the National Ambulance Service has been unable to meet response times set out in national key performance indicators.

The Service is especially challenged in its ability to meet the 7 minute 59 second target in some areas. In order for patients in rural areas to realistically receive responses in this time frame, greater involvement of trained members of the community in tandem with general practitioners (GPs), where possible, is the only likely solution to this problem. Community first responders provide a vital first response in the time period before an ambulance arrives, time which can make a critical difference for patients with certain conditions^(30;74;75).

Currently there are a total of 104 community first responder schemes in operation in Ireland registered for activation by the National Ambulance Service. These provide an invaluable service to their local areas. These schemes comprise a network of volunteers who are trained and certified by PHECC to respond to all ECHO and a small number of DELTA incidents, and include cardiac arrest, chest pain, choking and suspected stroke. These represent incidents at the more serious end of the treatment spectrum, with ECHO calls alone accounting for 2,500 - 3,000 patients per annum who in many cases could derive additional benefit from a supplementary rapid community response. Much of the funding and training required for the formation and maintenance of these schemes is provided through local volunteerism or from the Irish Heart Foundation.

The schemes link in with the National Ambulance Service to enable them to be activated by ambulance control to support emergency ambulances in response to incidents.

Typically, the scheme for each area works on a roster basis, with the rostered community responder holding a dedicated mobile phone which the relevant control centre will call to activate a response. The rostered person will then respond to specific calls aligned with their training within a pre-specified radius, usually within two kilometres and five kilometres of an agreed central point within the community.

The Review Team found that the distribution of the 104 community first responder schemes is uneven, with a high concentration in a number of counties such as Wicklow, yet no coverage in many counties where the National Ambulance Service is challenged in meeting response time targets. In an attempt to address this deficit, community first responder schemes and the National Ambulance Service have begun to work more closely together to expand the community first-response national network, and to build on the expertise that has already accumulated from those areas that are already in operation. In March 2014, the National Ambulance Service co-hosted a community first responder (CFR) conference – called ‘Respond 2014’ – with existing schemes in an attempt to build up this network across the country. A new organisation called CFR Ireland has also been formed to allow better linkage between schemes and foster further capacity building across the country.

Even in the very best resourced ambulance services internationally, response times achieved in rural areas are often slower than those achieved in urban settings, and services will identify and target areas at greatest risk with additional supports to aid in first-response capability. Greater involvement of qualified members of the community is seen as a valuable supplementary resource to improve the speed of first contact with a trained individual in the provision of first aid. It is important that the National Ambulance Service communicates with all external stakeholders to explain that a significant further expansion of community first-response schemes, especially in rural areas, is necessary to improve outcomes for patients in need. In turn, the National Ambulance Service could and should do more to facilitate new schemes, and drive the community first-response agenda, especially through the strategic targeting of areas most at risk of poor ambulance response times.

Pre-hospital emergency care – the patient pathway

In the time between a 999 or 112 call being made for an emergency ambulance, the patient being handed over to clinical staff in an emergency department, and the ambulance being made available to take another call, a consistent sequence of process steps needs to be efficiently and rapidly fulfilled in order to achieve timely, safe and effective management of the call.

Figure 4 illustrates each of these steps, which are followed in sequence through use of the ProQA system (emergency medical dispatcher software), and activation of the accompanying ambulance dispatch process. The same process steps are followed in all ambulance services that use the Advanced Medical Priority Dispatch System to:

- correctly define the location of the patient and the nature and acuity of the patient's condition
- prioritise the call against the availability of resources at that time
- ensure the patient receives the most appropriate and timely response.

Each step is assigned a time point or 'T' number from T0 to T21. This T annotation system is consistently used by all Advanced Medical Priority Dispatch System users, and it allows for both local inter-service comparison of time performance in progression through each step. The National Ambulance Service follows each of these steps in sequence, in what some services refer to as the Traditional Service Model of call handling and dispatch.

In general terms, four key stakeholder groups are involved in the patient pathway, following a 999 or 112 call.

The call-taker is responsible for steps T0 (call connect) to T9 (closure of the ProQA emergency medical dispatcher software system).

This part of the process requires the call-taker to accurately move through the process of establishing the patient's contact details, address, and to determine the chief medical complaint, from which a dispatch code and call prioritisation can occur. The call-taker will then in some instances remain on the line with the caller to provide first aid advice and reassurance until the ambulance arrives.

The dispatcher continues the call-handling process from step T10 (resource allocation time) to T12 (resource acknowledgement time).

These process steps require the dispatcher to identify the most appropriate resource (emergency ambulance, rapid response vehicle or officer vehicle) to send to the incident, and to coordinate communication with the resource to enable this to occur in an accurate fashion.

As illustrated in Figure 4, the dispatcher therefore:

- contacts the resource to allocate it to an incident (T10)
- communicates with the resource to hand over the necessary information (T11)
- and receives communication back from the paramedical staff to confirm this communication (T12).

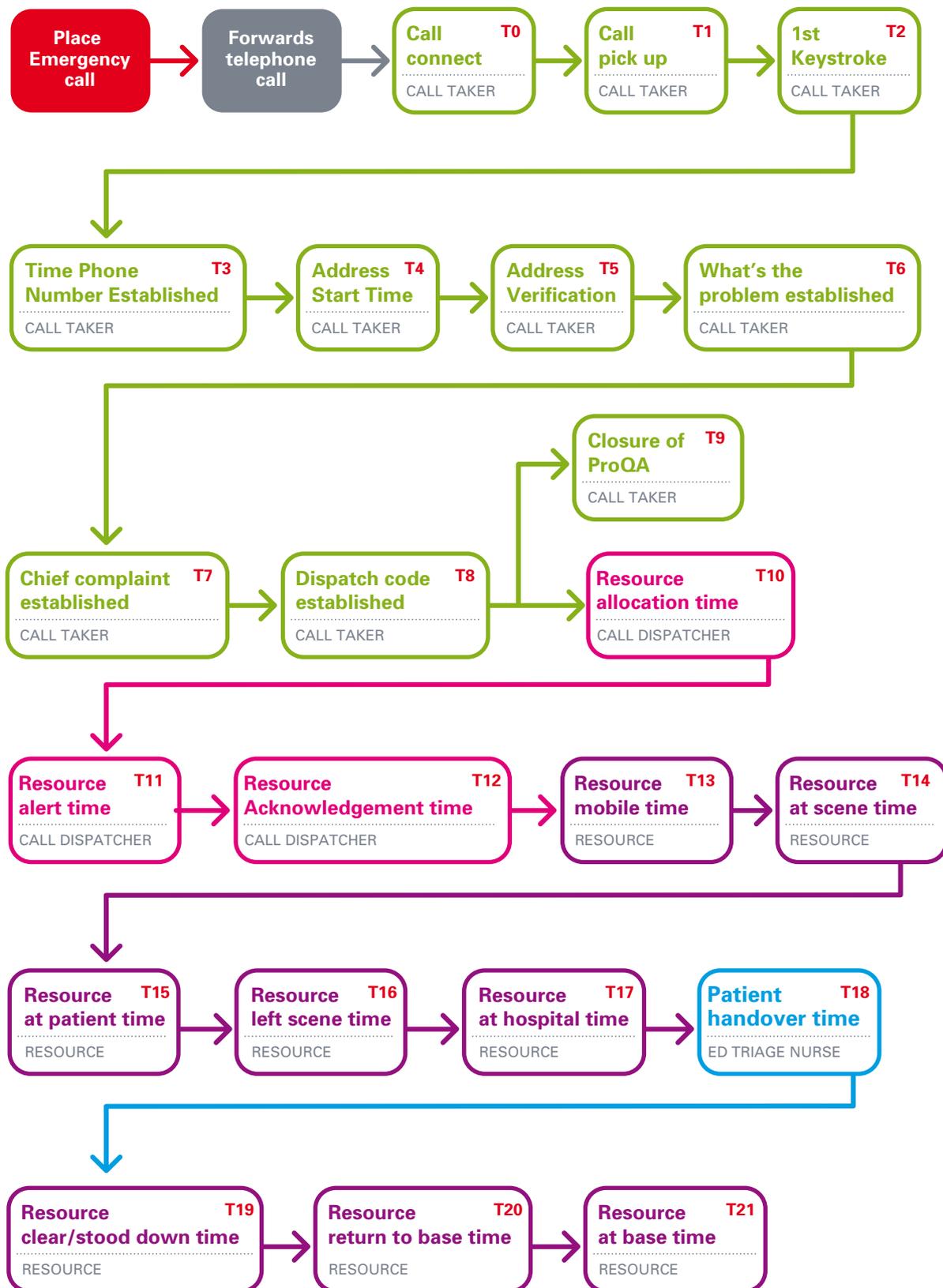
More than one resource may be allocated to an incident dependent upon the nature of the call.

The resource (such as the ambulance and its crew) then progresses through step T13 to T17, with each time point recorded with the computer-aided dispatch system by the crew through the remote activation of time-stamping using a console in the ambulance cab. These process steps require the resource to mobilise (T13) and travel to the scene (T14). Time to reach the patient (T15) is then recorded, followed by the administration of pre-hospital emergency care on scene. The resource then records the time they leave the scene (T16), and the time they arrive at the hospital emergency department (ED) (T17).

Internationally, ambulance services have mechanisms to measure the time it takes to handover patients to ED staff who are the fourth stakeholder group (T18). However, the National Ambulance Service only records the time between arrival at ED (T17) and the time when the ambulance crew have made the ambulance ready for reuse and available to take another call (T19). This is known as the clear time. Assuming the resource is then not remobilised to take a call in the time it takes to travel back to base, the call-handling process is completed with the steps of return to base time (T20) and resource at base time (T21).

The overall speed and accuracy of the call-handling process requires an exact, seamless and timely progression through all of these interrelated process steps. Reliability in the correct application of this process translates into higher performance as experienced by patients.

Figure 4. Pre-hospital emergency care patient pathway



Performance management of each step of the process should therefore be a key priority for an ambulance service focused on improving and optimising patient care. Indeed, many ambulance services invest a significant amount of time and effort in working to improve performance in call-handling and dispatch performance in particular. This is because it is within their ready control to influence this performance internally with limited financial investment.

National Ambulance Service performance in call handling, dispatch and mobilisation

In order for the Authority to assess National Ambulance Service's performance in the undertaking of the call-handling, dispatch and mobilisation processes, the Review Team undertook a series of visits to every National Ambulance Service control centre, observed practice, interviewed staff and reviewed policies and internal performance management processes and data. The data review included emergency response time key performance indicators for 7 minutes 59 seconds and 18 minutes 59 seconds.

The Authority also obtained internally validated National Ambulance Service ECHO and DELTA call data from each of the control centres over a 24-hour period from 08:00hrs on Friday 14 March 2014 to 08:00hrs on Saturday 15 March 2014, the first night of the St Patrick's Day bank holiday weekend for 2014. This period was chosen as it was anticipated that it would give an overview of the Service's recent ability to cope with respect to call handling and dispatch during a period of anticipated high demand for ambulance services. General findings were further triangulated with validated data provided by the National Ambulance Service for other three-month periods at various geographic locations around the country.

In interpreting the data, the Authority used median data (which describes the middle or midway data point in each set of numbers) to describe performance in each control centre as it was deemed to be a fairer representation of performance. This was because use of mean (average) data would be significantly influenced by a small number of outlier call handling times in what is a small dataset. It should be noted, however, that the service itself uses mean (average) times to benchmark its performance.

Table 1 below details total number of emergency ECHO and DELTA calls managed by the National Ambulance Service and the number of emergency resources allocated over the 24-hour period from 08:00hrs on Friday 14 March 2014 to 08:00hrs on Saturday 15 March 2014.

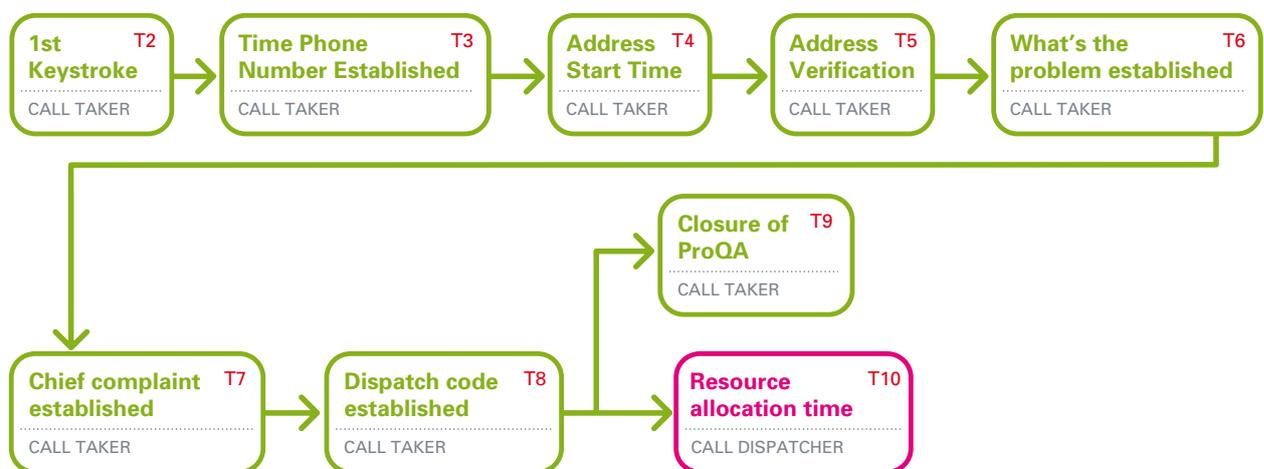
Table 1. ECHO and DELTA emergency calls managed by the National Ambulance Service (NAS) and emergency resources allocated from 08:00hrs on 14 March 2014 to 08:00hrs on 15 March 2014

24 hours, 08:00hrs 14 March 2014 to 08:00hrs 15 March 2014 – AS1 (emergency calls) ECHO / DELTA calls	Number of ECHO / DELTA emergency calls	Number of emergency resources allocated*
NAS, Townsend Street, Dublin 2	87	133
Limerick, Co Limerick	18	19
Ballyshannon, Co Donegal	7	8
Castlebar, Co Mayo	18	32
Tullamore, Co Offaly	14	20
Wexford, Co Wexford	22	30
Total	166	242

The following sections outline the Authority’s findings in relation the handling of calls by critical-call step over this time period.

Allocating a resource

Figure 5. Pre-hospital emergency care - patient pathway: T2 - first keystroke to T10 - Resource allocation time



* Number of emergency resources allocated denotes number of resources allocated, for example, a rapid response vehicle, an emergency ambulance, an intermediate care vehicle or an officer car.

It is the responsibility of the call-dispatcher (based on the information provided by the call-taker) to allocate the nearest available, appropriate resource to an incident in an efficient manner.

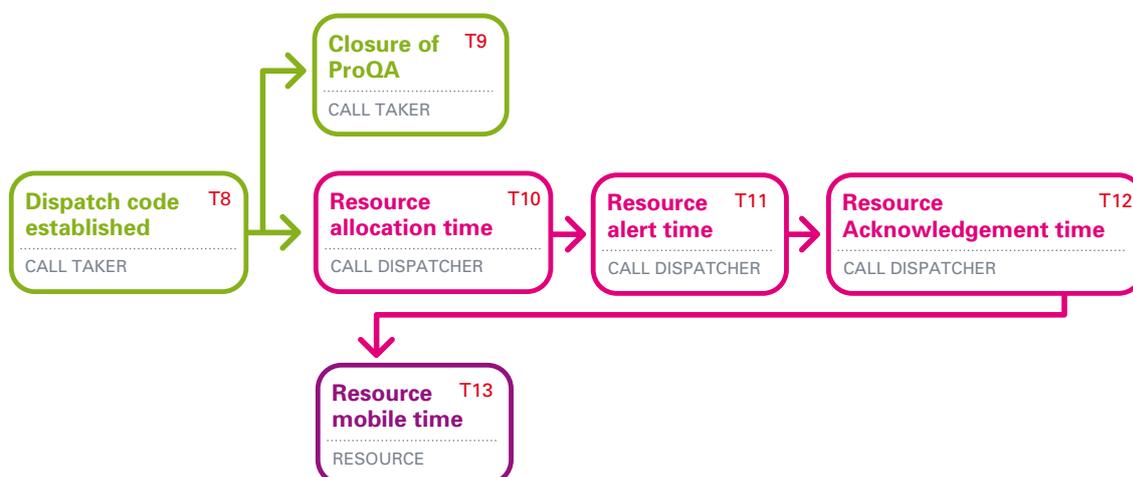
To monitor the Service's performance in time to allocate resources, the Review Team used a benchmark time of 90 seconds from the point of 1st Keystroke (T2) to the point of resource allocation (T10). This time frame was used as it was adjudged by the team to be a reasonable benchmark based upon international best practice^(76;77). The Review Team examined performance in the timely progression through these steps (T2 to T10) using the validated 24-hour data submitted by the National Ambulance Service for the period of 14 March – 15 March 2014.

Over this time period, Tullamore control centre allocated 64% of calls with emergency resources within 90 seconds. Limerick allocated 61% and Wexford allocated 55%. Ballyshannon reported that 0% of calls were allocated a resource within 90 seconds and the median time was 131 seconds. Only 6% of calls in Castlebar were allocated resources within 90 seconds. Townsend St, which accounted for just over half of all of the calls received only allocated 25% of calls within 90 seconds. The range of median response times per control centre varied from a minimum of 49 seconds to a maximum of 156 seconds to allocate a resource.

In interpreting this data, it should be noted that the National Ambulance Service has set a performance target of an average time of 90 seconds for an emergency response resource to be allocated, with timing starting from the point of dispatch code allocation (T8 – T10). The time the service targets to allocate a resource therefore starts at a much later time (T8) in the call-handling process than the time used (T2) by the Review Team, selected through international comparison.

Mobilising a resource

Figure 6. Pre-hospital emergency care - patient pathway: T8 - time dispatch code established to T13 - time resource mobile



Mobilisation time refers to the time it takes from the moment a dispatch code is issued to a call, to the moment when a crew starts to travel towards the incident in their vehicle. The National Ambulance Service has set an internal performance benchmark target time for this step in the process as an average of 180 seconds (T8 – T13).

Review of the internally validated 24-hour data provided to the Authority by the National Ambulance Service demonstrated that both Ballyshannon and Wexford control centres achieved an emergency resource time to mobilisation in 86% of calls within the target 180 seconds (T8 – T13), with the other control centres achieving less than 65% for the defined 24-hour period. The median time for each control centre varied from a minimum of 84 seconds in Ballyshannon to a maximum of 179 seconds recorded in Limerick. All centres therefore achieved a median result within the local benchmark target.

However, again it should be noted that the National Ambulance Service target is significantly less ambitious than that used in other jurisdictions which, in some services, is set as low as 90 seconds for mobilisation from the time of call connect⁽⁷⁷⁾ which is T0 – T13. Therefore, there is an opportunity for the Service to be more ambitious in its performance targeting in this part of the patient pathway in the interest of overall improved timeliness in call handling, and ultimately response time performance.

The front-loaded model of emergency call handling

So far, this report has outlined the National Ambulance Service's approach to call handling and dispatch, which uses what some services refer to as the 'Traditional Service Model'. This follows each process step, illustrated in Figure 4, in sequence.

However, internationally, many services have moved to an alternative model known as the 'Front-loaded Model'⁽⁷⁶⁾. This model takes a slightly different approach to call handling in that the dispatcher automatically begins the process of looking to mobilise a resource at the moment when a call location is identified, and as soon as the call is presented on the dispatcher's screen at T5.

At this earlier stage in the call-taking process all calls are assumed to be either an ECHO or DELTA call until proven otherwise. The dispatcher therefore begins their work at an earlier point (T5) in the lifetime of the call than would occur with the 'Traditional Model' as used by the National Ambulance Service, and consequently a resource is mobilised more quickly. In the event that the call is subsequently revealed to be lower in terms of priority, the dispatcher re-evaluates the dispatch decision, and the response may be stood down or realigned. Such an approach has been shown to further shorten response times for ECHO and DELTA calls.

This model is not systematically used by the National Ambulance Service, but could be considered as another mechanism to improve response times for patients.

Opportunity for further performance management in call handling and dispatch

Moving to one central reconfigured control room over two sites is a strategically correct move for the National Ambulance Service. However, it is unfortunate that at the time of the review, there was no evidence that the National Ambulance Service has begun a process of changing how it handles calls and mobilisation for emergency calls in its existing control centres, to improve efficiency, in advance of this move.

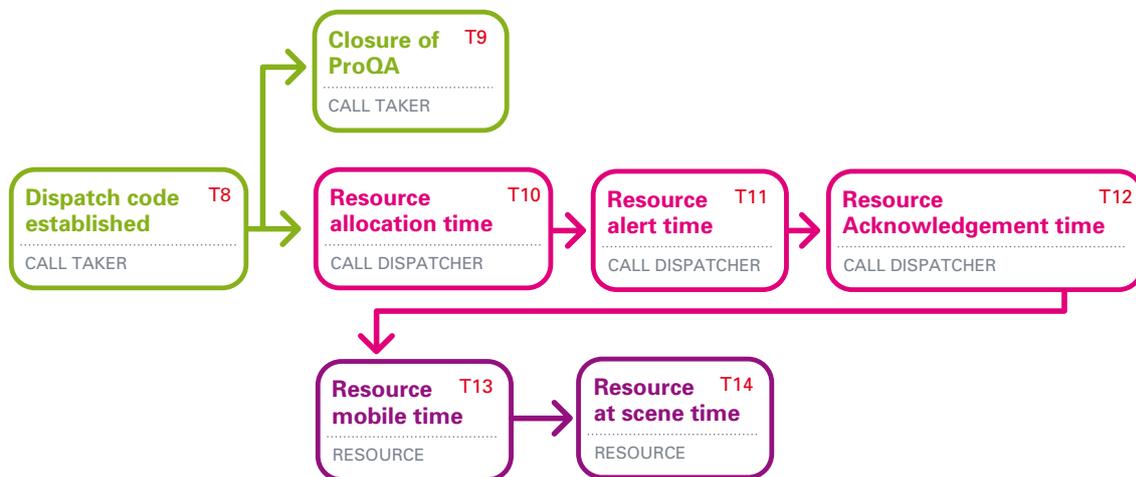
At the time of this review, all six centres, as seen from the evidence, were unable to attain the required standards for allocation of resources to emergency calls within defined time frames. This is despite the Service's internal targets for mobilisation being significantly longer than those applied by other ambulance services internationally. The Authority believes a reduction in these times should be achievable through effective process improvement, based upon international experience.

One method of identifying potential for improvement in addressing this problem is in the use of 'out of performance' reports which forensically examine the circumstances surrounding poor response times. Each call received by the service is automatically recorded step by step, both through audio recording, and through a time-stamped typed version of the sequence of events which are logged by the computer-aided dispatch system.

Examination of cases where performance was slower than expected on a regular basis can enable both control and operations managers to pinpoint areas for improving processes and performance management in call handling and mobilisation. Sustained improvement in performance can result. The Review Team recommends that such an approach is adopted by the National Ambulance Service.

First responder on scene within 7 minutes and 59 seconds

Figure 7. Pre-hospital emergency care – patient pathway: T8 – time dispatch code established to T14 – time the first responder resource arrived at scene.



First-response time reflects the time it takes for a suitably qualified individual who is notified of the incident from the ambulance control centre, to initially reach the patient. In the initial moments following arrival on scene, this person's role is to rapidly stabilise the patient's clinical condition. In many cases this may be an emergency ambulance response, but in other situations it may reflect a rapid response vehicle, an officer response vehicle, a passing intermediate care vehicle or a trained member of the public.

An emergency ambulance will be sent to all incidents, and the other first-response options outlined above therefore aid in shortening the time to first contact with a trained person, in the time period it takes the emergency ambulance to also travel to the scene. As previously explained, for many conditions the relative speed of initial clinical response corresponds to a clinical benefit for patients, and in all cases the faster the initial response the better the likelihood of a good patient experience.

First response for ECHO and DELTA calls within 7 minutes and 59 seconds or less in 75% of all cases was outlined as a key performance indicator in the *Pre-hospital Emergency Care Key Performance Indicators for Emergency Response Times* document published by the Authority in early 2011 and updated with minor revisions in 2012.

Following this publication, the National Ambulance Service began publically reporting its performance against this measure, but ceased to publically do so from October 2013. The rationale for this change in practice was explored with the Service through staff interview. It was explained to the Authority that the Service did not have the capability to accurately record a first response if the first responder was a member of a community first-response scheme rather than a National Ambulance Service resource.

As a result, the National Ambulance Service had concerns that the data was not 100% accurate and as a result ceased to report it.

Nevertheless, the Authority reviewed data provided by the National Ambulance Service relating to the percentage of Clinical Status 1 ECHO/DELTA calls responded to by a first responder in 7 minutes and 59 seconds, for 15 months from January 2013 to March 2014.

This data indicated a best monthly result for ECHO calls of 58%, and a best monthly result for DELTA call of 34% recorded over this time period, with all other results falling below this.

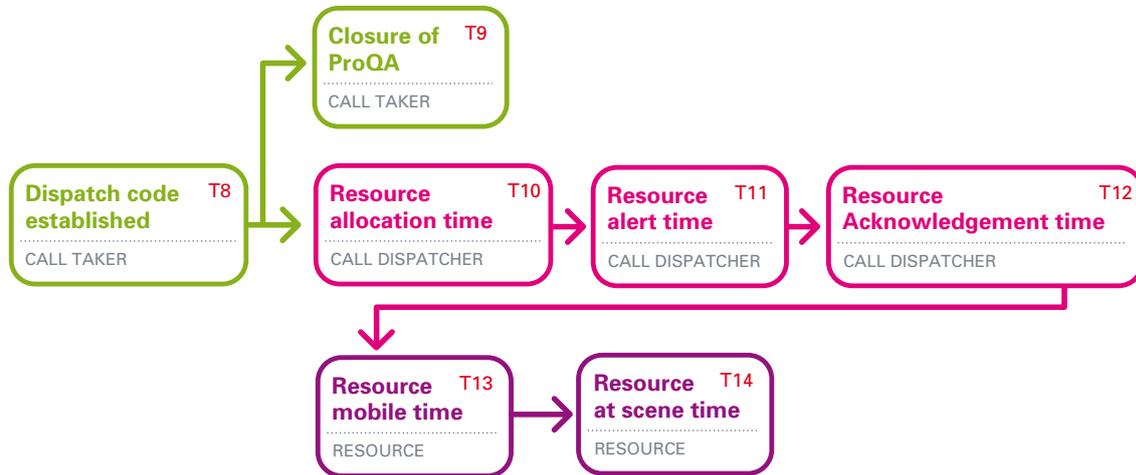
It is of concern to the Authority that the National Ambulance Service has ceased to report performance against the 7 minute 59 second key performance indicator. Regular monitoring of the Service's ability to meet this target internally provides vital information for the purpose of quality assurance, improvement and public accountability. Indeed in urban areas in particular, this data can prove critical in informing the strategic planning process for dynamic deployment.

In acknowledging the limitation to this current dataset, it should be noted that the total number of community first-response mobilisations nationally is relatively low in Ireland in comparison to the totality of ECHO and DELTA calls attended. In fact, by definition, community first responders only respond to a very small number of DELTA calls which account for the vast majority of calls measured in informing this indicator. Therefore, the likely impact of the inability to record community first response is small.

Regardless of whether a community first responder attended the scene first, the National Ambulance Service should still look to identify what it can do to improve its own individual performance. A rich seam of information for improvement could be gleaned from better use of this data, and accordingly the Authority has made recommendations in this regard.

Patient carrying vehicle within 18 minutes 59 seconds

Figure 8. Pre-hospital emergency care – patient pathway: T8 – time dispatch code established to T14 arrival of emergency resource (a patient-carrying vehicle) at the scene



The *Pre-hospital Emergency Care Key Performance Indicators for Emergency Response Times* sets out that all incidents which are categorised as ECHO or DELTA should have a patient-carrying vehicle* arrive on the scene within 18 minutes and 59 seconds. The National Ambulance Service has set the 2014 National Service Plan target at 80%^(78;79), with time measured from the point of dispatch code being established (T8) to arrival of emergency resource at the scene (T14).

The HSE publishes National Ambulance Service response times for ECHO and DELTA calls for patient carrying vehicles⁽⁸⁰⁾. Figures 5(a) and 5(b) below detail the percentage of ECHO and DELTA incidents responded to by a patient-carrying vehicle within 18 minutes and 59 seconds by the National Ambulance Service by area from January 2013 to June 2014.

The reported response times for ECHO calls from January 2013 to June 2014 showed the service plan target was not being achieved up to that date in 2014, and had in fact generally deteriorated since 2013. The reported response times for DELTA calls from January 2013 to June 2014 demonstrated that the service plan target had likewise not been achieved in 2014 up to that date.

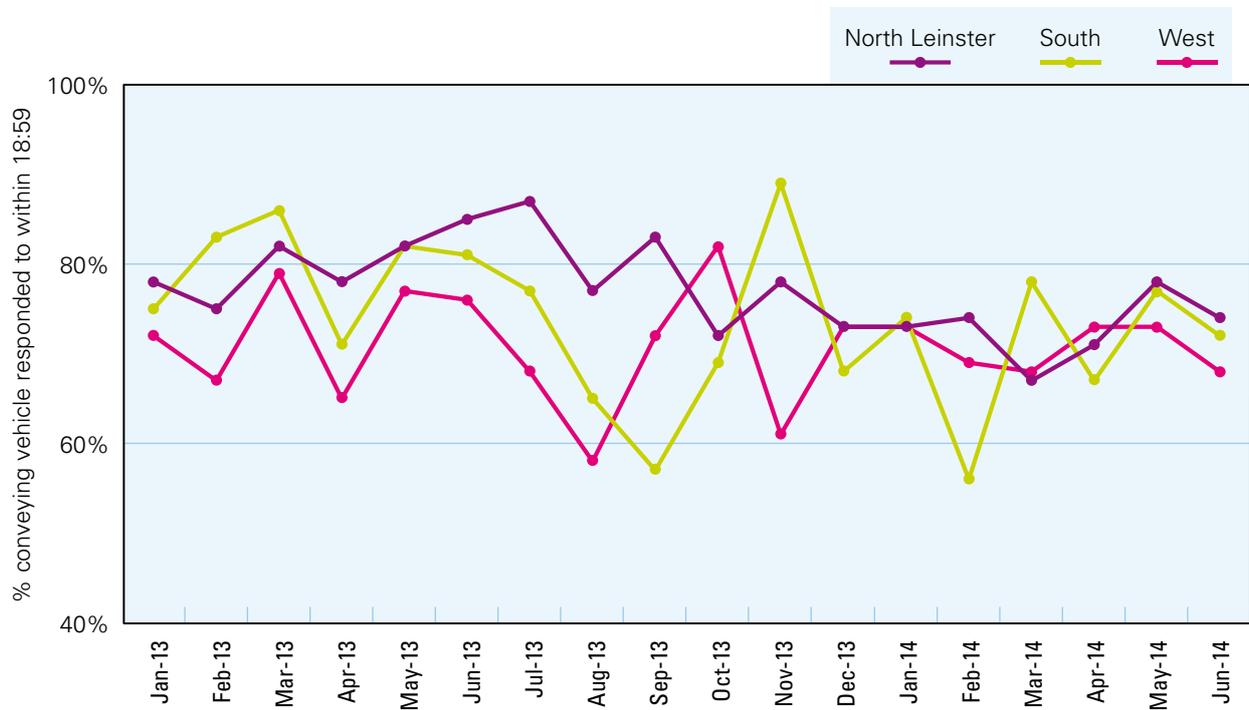
* A patient-carrying vehicle is any vehicle able to transport the patient in a clinically safe manner and dispatched from an ambulance service control room. An example includes a CEN [Comité Européen de Normalisation (Committee for European Standardization)] B compliant double crewed fully equipped ambulance.

Again, while the issue of available capacity for the service to deploy cannot be ignored in the interpretation of these figures, the Service's approach to the management of call handling, dispatch, mobilisation and dynamic deployment are all factors which could be improved to contribute to better performance without additional wholesale financial investment.

The HSE also regularly reports total ambulance service response time target attainment, and these have improved in 2014. It should, however, be noted in interpreting this data that these figures also include results reported from Dublin Fire Brigade. For the first 6 months of 2014, Dublin Fire Brigade performance in response to ECHO calls improved, at a time when National Ambulance Service performance deteriorated. Total national results represented the pooling of performance results from both service providers. Dublin Fire Brigade results have therefore positively impacted upon composite national results*. The reason for improved Dublin Fire Brigade reported result improvement will be further discussed in Chapter 10.

* During the due process phase of writing this report, the National Ambulance Service identified an improvement in reported response time performance against this indicator for July and August. This was partly attributed to the introduction of Intermediate Care Vehicles (ICVs), and the installation of new technology upgrades in control centres which enabled more accurate data reporting. The reporting of this data by the HSE on their website (www.hse.ie/performanceassurancereports) highlights that, in addition to ICV introduction and new technology in control centres, the method in calculating response times was changed in August relative to all previous months, to reflect only those ambulances which arrived at the scene. The Review Team were unable to verify the magnitude of the impact of each of these factors on improvement in reported response time performance, or its significance from a patient perspective, at the time of writing.

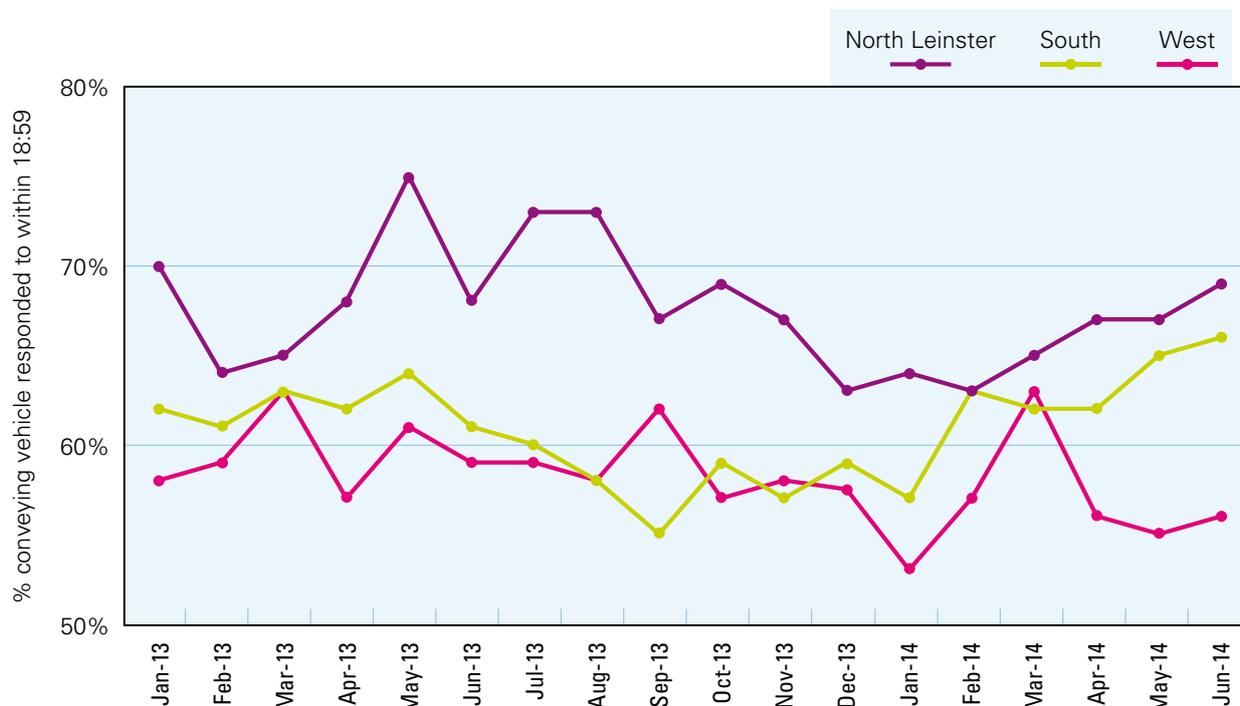
Figure 9 (a). Percentage of Clinical Status 1 ECHO calls responded to by a patient-carrying vehicle within 18 minutes and 59 seconds, January 2013 to June 2014



Data source: HSE Performance Assurance Report. Note data reported one month in arrears.

It was noted by the review team that there was significant variation in the attainment of this target by the National Ambulance Service on a month-to-month basis, with the South and West areas in particular seeing a high degree of variance. This variance in performance in each area warrants further investigation, with the identification of the reasons for this variation having the potential to help to identify further scope for improvement in performance.

Figure 9 (b). Percentage of Clinical Status 1 DELTA calls responded to by a patient-carrying vehicle within 18 minutes and 59 seconds, January 2013 to June 2014



Data source: HSE Performance Assurance Report. Note data reported one month in arrears.

The introduction of an air ambulance service for Ireland

Given the challenges faced by the National Ambulance Service in achieving a rapid response for patients in remote areas, in June 2012 the National Ambulance Service, in collaboration with the Air Corps (Irish air force), introduced a new air ambulance resource based in Athlone, on the borders of counties Westmeath and Roscommon. This resource may be deployed nationally to allow for the rapid response and transporting of patients who would otherwise not receive a service which is aligned with their needs due to their geographic location. Where necessary and feasible it may also be complemented by use of Irish Coast Guard air resources.

In the time period since its introduction, the air ambulance had proven to be a highly effective means of reaching patients in remote areas, and is a vital tool for dispatchers to deploy in situations where conventional transport will be incapable of achieving an effective response and transportation time. Over 700 missions have been conducted so far, with common calls including response to remote trauma cases or the rapid transporting of patients with heart attack (STEMI) in remote areas to specialist centres for stenting (PPCI). In a country such as Ireland with a remote and dispersed population in many areas, the availability of such a resource is vital and a significant development.

The air ambulance component is a critically important supplementary element of the National Ambulance Service response resources, especially for high acuity cases in remote areas. Best outcomes from usage of this resource will be achieved through deployment alongside a sufficiently resourced and efficiently deployed complement of road-based emergency ambulances.

Turnaround at hospital emergency departments (EDs)

At times of increased pressure in the hospital system, the National Ambulance Service experiences delays at emergency departments (EDs) with the handing over of ambulance patients to EDs. These delays occur because the ambulance crews are not able to hand patients over in a timely manner into the nursing care in these departments. Such delays can generally be attributed to a build up of the number of patients waiting on trolleys for examination or admission in the departments.

These delays with patient hand-over can lead to a significant and critical loss of capacity to the National Ambulance Service's emergency resources.

In May 2014, the National Ambulance Service in conjunction with the HSE's National Acute Hospitals Division introduced a performance indicator to monitor ambulance turnaround time at EDs⁽⁸⁰⁾. This turnaround time at EDs is the measurement of the time from when an ambulance arrives at the ED (T17 – vehicle arrival) to when the ambulance and crew are available to accept and respond to another call (T19 – vehicle clear). The HSE implemented a target time of 20 minutes for clinical handover of a patient and 30 minutes total turnaround time for the emergency vehicle and crew being ready to respond to the next incident. In practice the National Ambulance Service and many hospitals struggle to routinely meet this target.

Figure 10. Pre-hospital emergency care – patient pathway: T17 – T19 Ambulance Turnaround



Inability to rapidly turnaround ambulances in the ED usually relates to the overall rate of flow of patients through the hospital system⁽⁸¹⁻⁸⁶⁾. Patient flow in Irish acute hospitals is a complex issue of significant importance to patients and the system as a whole. A full exploration of issues influencing patient flow is, however, outside of the scope of this review.

Nevertheless, there are measures that the National Ambulance Service should explore in collaboration with acute hospitals to improve the current situation with ambulance turnaround time. Firstly, the Service only currently monitors ambulance clear time, which is the time between ambulance arrival on site and its availability

for the next call. While it is probable that this process is timely in most cases, evidence provided to the Authority during the review indicated that in some instances there may have been scope for more rapid availability of crews. Better management of this situation by control centres, aided by real-time data on actual patient handover time, has been shown in other services internationally to be effective in addressing this issue⁽⁸⁷⁾.

Difficulties in relation to patient flow, and consequently delay in handover of patients from emergency ambulances at the ED, involve a complex interaction between for example:

- departments within acute hospitals
- different acute hospitals within a geographic area
- other residential healthcare settings
- family doctors or general practitioners (GPs)
- the HSE
- the ambulance service in the form of both emergency transfer and patient transport services, and patients themselves.

This problem is not unique to Ireland. It was evident to the Review Team that currently the problem of dealing with difficulty in patient handover falls predominantly on the National Ambulance Service in isolation. The Service has a Hospital Liaison Officer, an escalation policy to manage lengthening turnaround times, and in some cases local National Ambulance Service managers sit on hospital committees to try to improve coordination. However, despite these measures, problems persist.

To properly address this issue, full ownership of the problem needs to be assigned to all stakeholder groups, and an ongoing programme of work, with all groups working together will be needed to define mutually agreeable solutions for all parties. This will also require the National Ambulance Service to assume a leadership stance in working to resolve this issue, through full collaboration with other stakeholders. In attempting to determine potential solutions for this problem, a number of areas for exploration should be considered by both the National Ambulance Service and other stakeholders.

At the time of writing, there is no arrangement or facility in place to enable all emergency departments, wider acute hospitals, the HSE and the National Ambulance Service to share information on a real-time basis in order to better manage patient flow into and out of hospitals. Ready access to shared real-time information may allow for a better, more coordinated approach to identifying when hospitals are at risk of flow difficulty. In doing so, it may be possible to more rapidly institute measures to ease flow through enactment of escalation policies, or targeted resourcing of intermediate care vehicles to hospitals to rapidly transfer patients out of hospitals before problems manifest in EDs and delay ambulances in handing over patients.

Early recognition of problems before they manifest as delay for ambulances is critical to the management of this issue.

Such an approach also requires greater communication between stakeholders, which should be a two-way process. For example, control centres should be empowered to routinely open communication with acute hospitals, GPs and other stakeholders to identify potential flow problems as they become aware of them to try to manage workflow in the interest of efficiency. Likewise, more formal lines of routine communication to control centres from, for example, hospital bed managers may aid in better flow of patients from hospitals through better coordination, and in doing so free up bed pressures.

In a situation where a more holistic approach to collective management of this problem is established, there may also be a potential for inter-hospital escalation policies, with management of emergency ambulance flow to hospitals to involve ambulance diversion in extreme circumstances. In assessing the potential suitability of this management option, a full awareness of the issues outlined in the 2012 National Emergency Medicine Programme Report will be required⁽⁸⁸⁾.

In addition, over the past number of years some smaller hospital EDs have been reconfigured to local injuries units. These units are only designed and staffed to accept patients who have a defined number of non-life threatening conditions. At the time of this report, they currently do not take patients from emergency ambulances. However, for patients who could conceivably go to the local injuries unit given their presenting condition, but who instead call 999 or 112 for an emergency ambulance, the current practice is to automatically transport them to an ED. In this situation, through careful collaboration between the National Ambulance Service and acute hospitals, it might be possible and indeed more appropriate for patients to instead be transported to a local injuries unit – if it is open at the time – and which may be closer to the scene of the incident and able to provide adequate treatment. Likewise increased use of 'treat and refer' or other patient pathway protocols by ambulance crews on the scene would reduce delay associated with avoidable hospital attendance and prolonged hospital turnaround time.

It is recognised by the National Ambulance Service that slow turnaround time is having an impact on its ability to provide an effective service. In response to this issue, the National Ambulance Service is in the process of enhancing its current turnaround time framework, which was published in early 2014. The current published framework proposes to address the issue largely through escalation of communication with hospitals and crews in the event of a delay in clearing ambulances from EDs. While in theory this may have some impact in improving hospital awareness of delay, it will not address the totality of the issue which relates to a more complex interaction between the ambulance service, acute hospitals and other stakeholders involved in facilitating the downstream flow of patients.

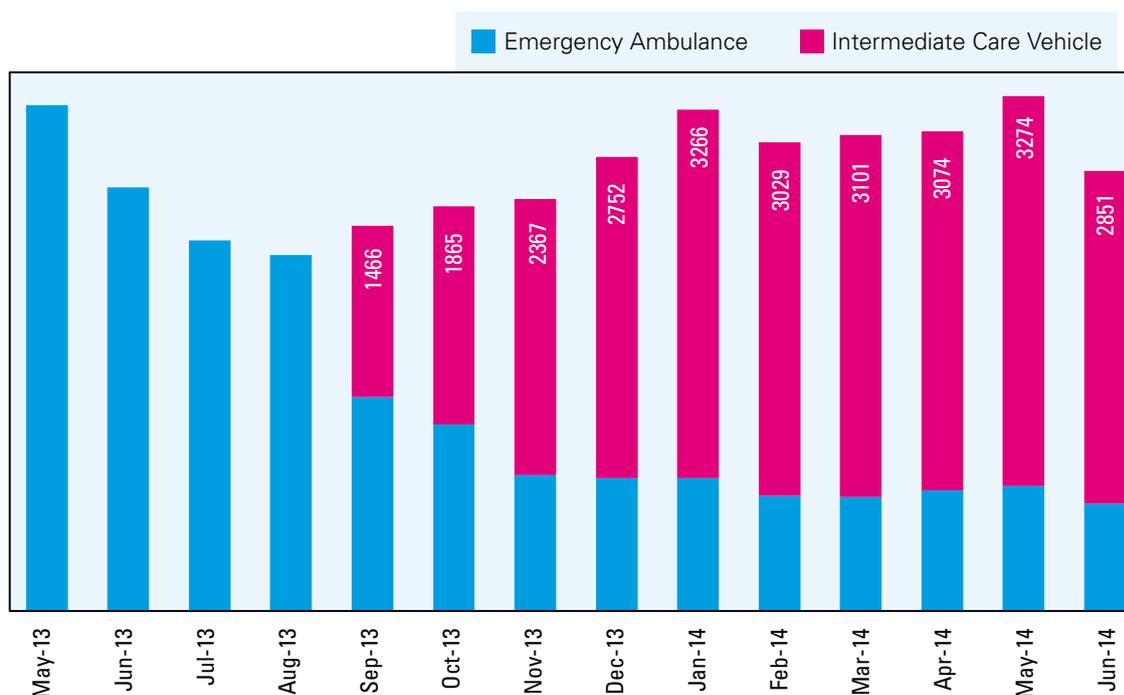
Effectively addressing this complex problem will require a prolonged multi-organisational approach, with close cooperation over a significant period of time. It is hoped that the revised framework that is being devised will be more holistic, and will reflect the recommendations made by this review.

The impact of the new intermediate care services

A new Intermediate Care Service was introduced by the National Ambulance Service in September 2013 to provide a safe and timely transfer of non-emergency patients throughout the healthcare system. An average of 3,700 non-emergency patient transportation calls (AS3) are facilitated monthly by the National Ambulance Service. Table 2 demonstrates the percentage of non-emergency calls by emergency ambulances and intermediate care vehicles.

In 2014, intermediate care vehicles transferred approximately 75% of non-emergency calls, thereby extending the availability of emergency ambulance resources for emergency calls. Indeed, intermediate care vehicles have the capacity to carry two patients at a time, and therefore free up more than one emergency ambulance when they are used in this way. Transportation round trips can be especially long, particularly in the case of transfers between hospitals throughout the country and Dublin hospitals. Therefore, on a case-by-case basis significant gains in efficiency have been achieved with the introduction of intermediate care vehicles.

Table 2. Number of non-emergency calls by emergency ambulance and intermediate care vehicles from May 2013 to April 2014



Data source: HSE Performance Assurance Report.

The introduction of intermediate care operatives and the use of intermediate care vehicles has been a significant and successful development for the National Ambulance Service in enabling greater emergency ambulance availability for acute calls. The investment in this tier of vehicle and practitioners by the National Ambulance Service has been an important step for the service in making better use of emergency ambulance resources. If used wisely alongside other performance improvement interventions, intermediate care vehicles will help over time to improve overall ambulance service response performance.

Dublin Fire Brigade findings

Chapter 7 – Leadership, governance and management

Introduction to leadership, governance and management

Dublin City Council is the fire authority for Dublin and has the statutory power to provide ambulance services in Dublin under the Fire Services Act, 1981⁽⁸⁹⁾. It does this through its Dublin Fire Brigade service.

In reviewing the governance, leadership and management of the pre-hospital emergency care service provided by Dublin City Council through Dublin Fire Brigade, the Authority acknowledges that there are differences between the purpose and function of the Health Service Executive's (HSE's) National Ambulance Service and the Dublin Fire Brigade pre-hospital emergency care service. Dublin Fire Brigade provides fire brigade, ambulance services, other rescue services, and event and location licensing services and therefore its corporate structure and operational arrangements are organised differently.

In the context of this review, the Health Information and Quality Authority (the Authority) reviewed the capacity and capability of Dublin Fire Brigade to effectively deliver pre-hospital emergency care services in the Dublin area, to ensure the timely assessment, diagnosis, initial management and transporting of an acutely ill patient to an appropriate healthcare facility.

This chapter summarises the Authority's findings on the governance and organisational structures and arrangements in place in Dublin Fire Brigade's pre-hospital emergency care services up until October 2014.

Findings

The division of emergency ambulance services in Dublin City and County

The Dublin Fire Brigade control centre in Townsend Street in Dublin City Centre receives all emergency ambulance calls for County Dublin, with the exception of the former Dún Laoghaire Fire Service Area in southeast County Dublin, where calls are taken by the National Ambulance Service. Emergency ambulance services in the city and county are divided between the National Ambulance Service and the Dublin Fire Brigade on geographical grounds (see Figure 6), with Dublin Fire Brigade covering most of the heavily populated areas. The National Ambulance Service covers north County Dublin, from a dedicated National Ambulance Service station located in Swords.

Dublin Fire Brigade operates a further emergency ambulance from its fire station in Swords. The National Ambulance Service also covers the southeast of the county in the former Dún Laoghaire Fire Service Area, through a station located in Loughlinstown. These service areas between Dublin Fire Brigade and the National Ambulance Service were agreed following a 1993 review of ambulance services in Ireland. The National Ambulance Service also has stations on James's Street in the inner city and Airton Road in Tallaght, Co Dublin.

The Review Team was informed during the review that the James's Street and Airton Road stations evolved out of a need to handle non-emergency ambulance demand in Dublin City. However, the stations also provide an emergency ambulance response at the request of the Dublin Fire Brigade should the National Ambulance Service be in a better position to provide a timely response on account of Dublin Fire Brigade's inability to meet demand. It was explained to the Review Team by members of the Dublin Fire Brigade that a reciprocal situation exists in National Ambulance Service areas, but that this is rarely availed of as Fire Brigade resources would not generally have reason to be in National Ambulance Service areas.

The Dublin Fire Brigade control centre in Townsend Street therefore transfers emergency calls to the National Ambulance Service where the incident is outside of the Fire Brigade's area of responsibility north of Swords. The National Ambulance Service both receives and responds to calls in Dún Laoghaire independently from Dublin Fire Brigade. Dublin Fire Brigade operates a fleet of 12 emergency ambulances on a 24-hour seven-day (24/7) basis.

These ambulances are located at 11 fire stations around the Dublin region, in:

- Donnybrook
- Dolphin's Barn
- Phibsborough
- North Strand
- Finglas
- Kilbarrack
- Tallaght
- Rathfarnham
- Blanchardstown
- Swords (at a different location to the National Ambulance Service station)
- Tara Street, Dublin 2 (where there are two ambulances located).

With the exception of Swords, the other ambulance locations have been in use without change for a number of years.

It was explained to the Review Team by Dublin Fire Brigade that the National Ambulance Service funds 11 of the 12 ambulances only, which are all the ambulances other than one ambulance based in Swords fire station.

Figure 11. Geographical division of National Ambulance Service and Dublin Fire Brigade ambulance services across Dublin*



Figure 11 is a map that was provided to the Review Team by the Dublin Fire Brigade as part of the document request process. It outlines the Brigade's understanding of their areas of responsibility following the 1993 Review of Ambulance Services, with clearly demarcated areas for both the Dublin Fire Brigade and the National Ambulance Service. This map was subsequently presented to the National Ambulance Service by the Authority during the due process phase of report generation to confirm that they were of the same understanding in relation to these boundaries of responsibility. Members of the National Ambulance Service senior leadership team explained that they were unaware of the presence of these areas, and stated that there were no such areas in operation to their knowledge. The lack of alignment in relation to this issue between both service providers illustrates the poor level of cooperation and integration found between both services, which is also variously explored throughout this report.

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The nature of these boundaries has been further confused by the Dublin Fire Brigade introducing a new ambulance to the Swords fire station in 2007. It was explained by the Dublin Fire Brigade that this ambulance is funded by Dublin City Council.

The Fire Brigade outlined that this fire station in Swords was intended to provide capacity for Dublin Fire Brigade calls in the northern part of their area of responsibility in north Dublin city, and also north of Swords in the National Ambulance Service agreed area. It was explained to the Review Team by Dublin Fire Brigade that this was due to a need to respond to incidents in this area as a result of reported National Ambulance Service lack of capacity, as perceived by the Brigade. It was evident to the Review Team that this arrangement, with both service providers having resources in the same location, but without pooling of this resource and a clear collective strategy for deployment, did not lead to best use of available ambulances and advanced paramedics. The Authority's Review Team also notes that while ambulance resources have increased in Swords, other areas of Dublin – which have likewise experienced a significant increase in population growth in recent times – have not seen any change in the existing level or location of emergency ambulance services.

Governance, leadership and management

Corporate – Dublin City Council

Executive responsibility and accountability for providing services within Dublin City Council is jointly shared by the Dublin City Council and an appointed executive, the Chief Executive of Dublin City Council. The City Council's governance structures include a Senior Management Team which is chaired by the Chief Executive of the Council. The Senior Management Team assists and supports the Chief Executive in leading the organisation. Responsibility for Dublin Fire Brigade has been delegated by the Chief Executive of the Dublin City Council to the City Council's Head of Finance who is a member of the Senior Management Team.

The Head of Finance is Chairperson of a monthly Executive Managers meeting where the Chief Fire Officer provides a monthly update on Dublin Fire Brigade's ambulance services. The minutes of six Executive Managers meetings held up to the time of this review were examined by the Review Team. They indicated that the main Dublin Fire Brigade issues discussed included the Dublin-City-Council- and HSE-commissioned review, and the national ambulance capacity review.

It was reported by senior Dublin City Council and Dublin Fire Brigade staff that detailed Fire Brigade service and performance issues are not discussed at this Dublin City Council forum. Staff explained that these are discussed at specific Dublin Fire Brigade executive forums.

Providing safe and effective pre-hospital emergency care services by two distinct agencies requires rigorous service level and interfacing governance arrangements. These arrangements were explored at interview with senior Dublin City Council staff. These staff reported that there were no formal structured governance arrangements in place covering ambulance services, and how they perform, between Dublin City Council and the HSE and the HSE's National Ambulance Service.

It is of serious concern to the Authority that at the time of this review there was no evidence of integrated management of pre-hospital emergency care in the most heavily populated region of Ireland.

It was further explained by both the Dublin Fire Brigade and the National Ambulance Service that this has been a long-standing concern. As far back as 2005, a joint review of ambulance service within Dublin City and County was commissioned by the then National Ambulance Service's Assistant National Director and Dublin City Council Head of Finance.

This 2005 review was published in 2007 and set out 15 main recommendations which focused predominately on governance, operational management, communications, training and clinical governance in order to align the services within the National Ambulance Service and Dublin Fire Brigade. This was with the ultimate aim of providing a consistent, integrated, safe and effective ambulance service. At the time of the Authority's review, seven years following the publication of this earlier review, the Authority found that these specific governance recommendations had not been fully implemented. As a result, the current governance arrangements between Dublin Fire Brigade and the National Ambulance Service remain disjointed with inadequate quality assurance and accountability controls, complicated by the lack of a formal service level agreement between the overarching HSE and Dublin City Council.

Notwithstanding the lack of strong and transparent governance arrangements and the lack of an integrated ambulance service, funding continues to be provided by the HSE to Dublin City Council as a contribution towards the costs of providing a pre-hospital emergency care service. Such was Dublin City Council's concern with this arrangement that in November 2013 the Chief Executive of the City Council wrote on behalf of the four Dublin local authority managers to the Director General of the HSE highlighting the difficulty in providing a service under the current funding arrangement.

This was further explored by the Review Team with senior Dublin City Council staff. They explained that the integrated fire, rescue and emergency ambulance service is provided 24 hours a day, 365 days a year. There are currently over 1,000 active personnel making it the largest fire service based on manpower and resources in Ireland. The annual cost of providing this service is €110.98 million, with the net cost shared between the four Dublin local authorities. Dublin City Council received funding of €9.16 million from the HSE in 2014. However, senior

Dublin City Council and Dublin Fire Brigade staff reported that the estimated cost of running the emergency medical service is somewhere between €14 million to €18 million approximately, which includes €1.1 million opportunity cost by using fire appliances at some medical incidents. It was reported that this shortfall is currently being met by the four Dublin local authorities.

Up until 2012, there was no formal agreement or contract between the HSE and the Dublin Fire Brigade. However, in 2012 the HSE set up a 'Memorandum of Funding' with Dublin City Council. This arrangement and the lack of sufficient quality assurance processes was further explored with the senior Dublin City Council staff. They recognise that the current legacy arrangement with the HSE is neither adequate nor sustainable.

As a result, and working with the HSE, they have commissioned a joint review of all aspects of the ambulance services operated by Dublin Fire Brigade in the Dublin city and county area. Both Dublin City Council and the HSE reported that this is expected to be finalised in December 2014. The review aims to determine the best model of ambulance service, which meets the highest standard of emergency response, and where the care meets all national safety and quality standards. It also aims to determine the most cost-effective model of service provision.

Dublin Fire Brigade

Dublin Fire Brigade is a structured uniformed service with a defined hierarchical rank structure. The head of the Dublin Fire Brigade is its Chief Fire Officer, who is responsible for service delivery and who reports directly to the joint Dublin City Council Head of Finance. Figure 11 outlines the senior organisational structure of Dublin Fire Brigade.

The first tier of management is four posts of assistant chief fire officers. Each assistant chief fire officer post has a defined portfolio of responsibilities. The four areas of responsibility they individually are responsible for are:

- major emergency management, information communication technology and management of the control centre
- management of operations for the fire and emergency services and emergency medical services
- training, logistics and staff health and safety
- fire prevention and community fire safety.

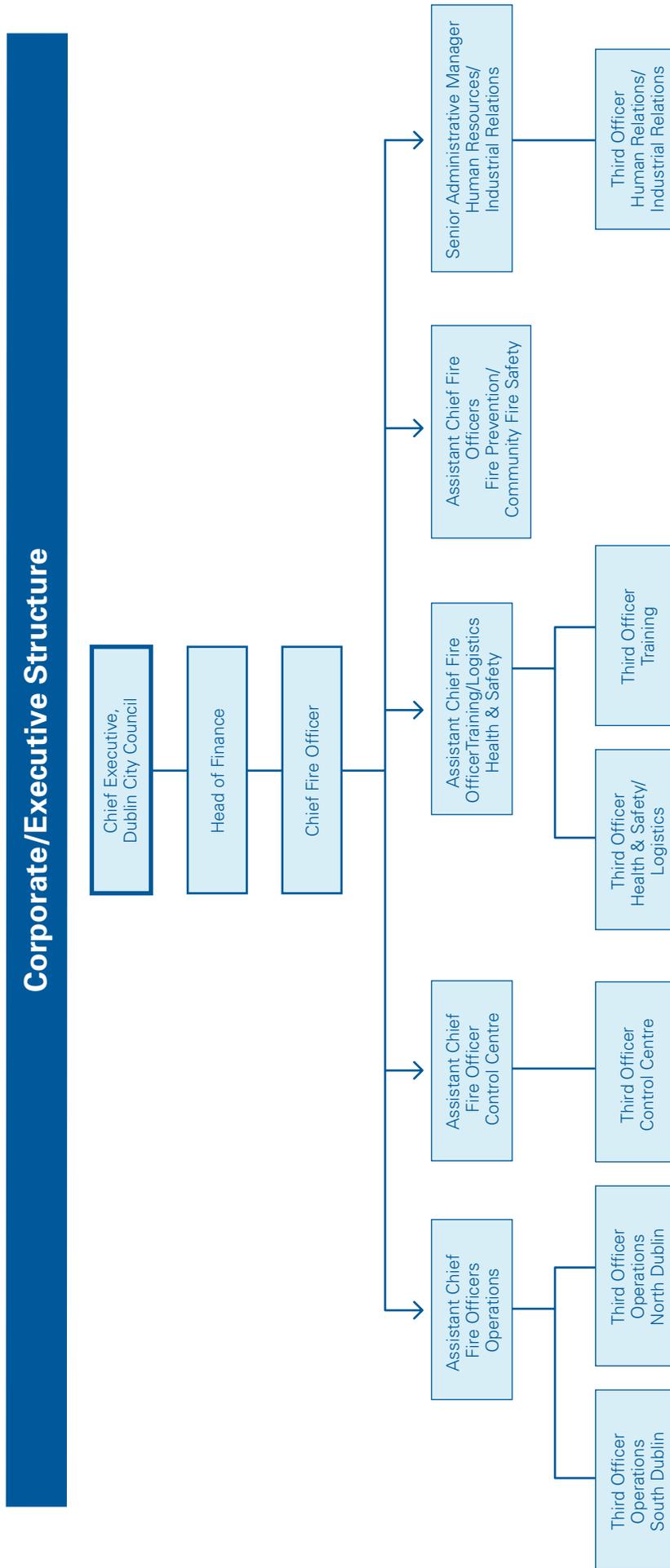
In addition, there is a senior manager dealing with human resources, finance and communications.

The second tier of management is the post of 'third officer'. These are senior managers within the Dublin Fire Brigade and they report to the assistant chief fire officers. The third officers have delegated responsibility for managing control centres, operations, training and logistics and emergency medical services.

The third tier of management includes operational district officers who are the most senior district officers for each watch (Dublin Fire Brigade staff are divided into four groups or 'watches' on a rotating shift pattern to provide cover across the week), and a district officer with operational responsibility for the day-to-day management of the control centre. In turn, operational station officers report to the operational district officers. Below them, operational sub-officers report to the operational station officers.

The final tier includes the 764 operational dual trained firefighter-paramedics. There is a staffing roster ensuring that a senior, middle and front-line command level and emergency response staff are available 24 hours a day, 365 days a year. While the organisational structure appeared to be very hierarchical, all staff interviewed and met during the focus groups and during on-site observations were clear on the reporting structures and comprehensively aware of their areas of responsibility.

Figure 12. High-level governance structure for Dublin Fire Brigade



Strategic planning, vision and direction

The Chief Fire Officer, in consultation with the Dublin City Council Chief Executive and Head of Finance, is responsible for the development of the Dublin Fire Brigade strategy.

During the interviews with senior Dublin Fire Brigade and Dublin City Council staff it was apparent that Dublin Fire Brigade depends on the findings of the commissioned HSE and Dublin City Council review of Dublin Fire Brigade ambulance services to inform its overall direction. Senior Dublin Fire Brigade staff reiterated (with significant frustration) how they feel stymied by the current arrangements. Beyond maintaining their current level of service, they reported that they cannot plan for the future. As previously identified by the Review Team, the current model of funding, the absence of sufficient quality assurance arrangements between the commissioner of the service (HSE) and the provider of the service (Dublin Fire Brigade) and the lack of an integrated ambulance service is unsustainable and potentially unsafe.

The Dublin Fire Brigade strategic plan for the period 2012–2014 was submitted to the Authority as part of its document and data request. While the main thrust of the strategy related to the provision of fire services, there are specific strategic plans in relation to emergency medical services which include governance, staff training, technology and the development of key performance measures.

This strategy is operationally translated into the Environment, Engineering and Fire Brigade and Emergency Medical Services Business objectives for 2014 which set out important actions across the fire, rescue and ambulance service. Specific ambulance quality and safety objectives included:

- developing clinical audit systems
- developing protocols to support the direct access to the cardiac catheterisation laboratory for patients with a myocardial infarction (heart attack)
- ensuring the ambulance fleet and emergency equipment is fit for purpose.

The Authority's Review Team confirmed that a well structured implementation system is in place across Dublin Fire Brigade.

Documentation reviewed showed that each objective has a defined timeline, a named accountable person, with an outcome and status update identified and recorded.

Similar to the National Ambulance Service's strategic plan, there is no Dublin Fire Brigade strategic plan to address the risks arising from not having an integrated pre-hospital emergency care service in Dublin. More worryingly, it was apparent that while the National Ambulance Service Control Centre Reconfiguration Project is a crucial Ambulance Service strategic objective – and will have major impact on Dublin Fire Brigade – this was not reflected in the Dublin Fire Brigade strategy.

This was explored with senior Dublin Fire Brigade staff who explained that there was little formal engagement with the National Ambulance Service and the HSE. Dublin Fire Brigade, at the time of writing, reported that it was not actively involved in the National Ambulance Service planning process for the National Ambulance Service Control Centre Reconfiguration Project. This project includes moving the National Ambulance Service's control centre located in a control centre shared with Dublin Fire Brigade in Townsend Street to Tallaght, Co Dublin, some 8 miles away. Dublin Fire Brigade highlighted its concern in maintaining a seamless service throughout this transition.

This again reinforces the disjointed governance arrangements, the lack of effective alignment of services and the absence of effective communication pathways between both service providers in the provision of safe, effective and integrated pre-hospital emergency care services in Dublin. This ongoing situation is not acceptable and must be immediately addressed.

Executive – Dublin Fire Brigade

The Chief Fire Officer is head of Dublin Fire Brigade. There is a monthly meeting between the Chief Fire Officer and the four Assistant Chief Fire Officers and the senior manager with responsibility for human resources. This group provides the leadership function within Dublin Fire Brigade. They coordinate their approach through a formal monthly meeting structure and regular informal meetings. The agendas of the meetings of the Chief Fire Officer and Assistant Chief Fire Officers were read by the Authority's Review Team. They detailed the standing items which included recent developments, the efficiency agenda and service updates from each attendee.

In addition, there is a monthly ISO (International Organization for Standardization) quality management review meeting, where the Chief Fire Officer is the chairperson, with the leadership team and the Chief Executive of Dublin City Council in attendance.

It was explained at interview, and viewed in the documentation submitted by Dublin Fire Brigade, that this forum is the main arena for discussions and updates on the implementation of the 2014 Dublin Fire Brigade business objectives.

The Dublin Fire Brigade business objectives are structured under the headings of:

- objective
- key actions
- performance measures and accountability.

These are updated monthly by the accountable person and formally reported on at the ISO meeting. It was evident to the Review Team that this approach was effective and that performance was measured and underperformance challenged.

In addition, the quality and safety of the service – to include review of the risk register, human resource developments and concerns, and operational activity and financial performance – are actively discussed.

Dublin Fire Brigade's quality management system received accreditation under ISO/9001/2000 Quality Management System⁽⁹⁰⁾ in 2002 and has maintained ISO accreditation since then. It was reported by senior staff and viewed in the documentation received that process and procedures for pre-hospital emergency care have been developed in line with ISO standards to include checking of equipment for emergency ambulances, response to ambulance mobilisation calls, and management of adverse clinical events. An internal audit programme is in place which includes audits of the control centre and the emergency medical services.

Performance indicator targets are set in the business plan and these are reported against the monthly report. However, the senior management team of Dublin Fire Brigade stated at interview that it is becoming increasingly difficult for ambulance services to meet targets as they believed the number of resources has not increased to meet demand. The performance of Dublin Fire Brigade ambulance services will be further discussed in Chapter 9 of this report.

There is a performance management and development system – a system used across the public and private sector as a mechanism for the personal development and performance management of staff – in place for the Dublin Fire Brigade senior management team, which sets out the key actions and the responsible person with key performance measures of success. Each of the actions is measurable and quite specific. Senior staff interviewed reported that this is an effective system and is helpful in achieving their respective business objectives and personal professional development.

Operational management

The Dublin Fire Brigade staff complement is divided into four groups or 'watches', lettered A-D. These watches work on a rotating shift pattern to provide cover across the week. There is a monthly district officers meeting across each of the four watches between the Assistant Chief Fire Officer, the Third Officers for Operations, and the district officers. Agenda items include district operational issues, logistics information, station visits and or audits, absenteeism rates, incident report protocols and training-needs analysis. Business plans and strategic planning are also included in the agenda for these meetings. The agenda and minutes of these meetings were viewed by the Review Team who concluded that these meetings are well structured, and are attended by all members who comprehensively discuss all operational issues to include ISO audits.

It was demonstrated in the documentation reviewed, and seen during the on-site observations of this review, that weekly stations audits are conducted by third officers to include a review of the stations' paperwork, cleanliness of each station and ambulances and also an inspection of equipment checklists. Regular in-house audits support National Standards Authority of Ireland (NSAI) surveillance audits as part of the ISO accreditation process which takes place every three years. The Assistant Chief Fire Officer with Emergency Medical Services Operations carries out an inspection of each station once a month in addition to a formal audit of each station once a year.

Since 2006, it was explained to the Review Team that the Dublin Fire Brigade Emergency Response Control Centre, located in Townsend Street, has been accredited by the National Academy of Emergency Dispatch, now the International Academies of Emergency Dispatch (IAED). It is the first control centre in Ireland to achieve accreditation as a Centre of Excellence by the International Academies of Emergency Dispatch. There is a Control Centre Working Group monthly meeting overseeing all associated control-centre operational issues. It is attended by third officers, station officers, station officers, sub-officers and firefighter-paramedics. The Review Team confirmed that the meeting format and structure ensures that operational issues are discussed with evidence of reciprocal actions being implemented. The action items include the provision of handheld radios, quality of sound in the control room and the use of internal phone directories.

Pre-Hospital Emergency Care Council (PHECC)

Similar to the National Ambulance Service, the Dublin Fire Brigade Medical Director and senior Dublin Fire Brigade staff have a prominent and ongoing involvement with important Pre-Hospital Emergency Care Council (PHECC) committees.

Risk management

As part of the review process, the Authority requested that Dublin Fire Brigade provide copies of its risk register for 2013 and 2014. This was designed to give an overview of the potential risks the service had identified, and active steps being undertaken to address those risks.

In response to this request, Dublin Fire Brigade provided the Authority with documents outlining a total of 27 different risk-based scenarios related to providing its service. These scenarios included emergency medical service situations such as patient assessment, respiratory emergencies and numerous examples of potential treatment emergencies. The documents showed the adjudged level of potential risk associated with each scenario using a standard risk matrix (a paper-based tool used to score risk by possible severity and likelihood of occurrence). The documents also showed the current controls enacted by the Fire Brigade to reduce each risk.

This approach to active identification of risk through scenario planning and risk mitigation demonstrated a strategic approach to risk management by the service. In addition, the Dublin Fire Brigade described use of a number of additional risk management practices which permit staff who encounter risk during the course of their duties to senior staff via a number of means.

The Review Team also examined risk registers maintained by Dublin City Council which included a corporate risk register encompassing the Dublin Fire Brigade. There were, however, no risks included which related to the emergency medical service part of the Brigade's function.

Command and control

The Dublin Fire Brigade control centre is in the same shared room as the National Ambulance Service control centre in Townsend Street. Dublin Fire Brigade and National Ambulance Service staff work independently and both use different information technology systems.

A third officer who reports to an assistant chief fire officer has responsibility for the operational efficiency of the Dublin Fire Brigade control centre. Historically, all staff working in the Dublin Fire Brigade control centre were dual trained firefighter-paramedics. However, at the time of the Authority's review, Dublin Fire Brigade reported that it had replaced 20 control centre staff who were trained firefighter paramedics, with staff who are not firefighter paramedics.

The Dublin Fire Brigade control room coordinates 12 emergency ambulances and will also mobilise fire tenders to respond to certain life-threatening calls.

The Logistics Section of Dublin Fire Brigade is responsible for the purchase and maintenance of its fleet and equipment. Dublin Fire Brigade currently has a fleet of 110 vehicles, which include 12 emergency ambulances. There was evidence that at the time of this review it was fully compliant with national and European medical fleet and equipment standards. There was also evidence that it has a rigorous maintenance schedule in place with emergency ambulances undergoing weekly critical safety checks. Seventy five per cent of the 12 emergency ambulances are over four years old, and at the time of this review no ambulance had been replaced since 2011. It was explained to the Review Team that Dublin Fire Brigade have gone to tender for the supply of three new ambulances, to be delivered in early 2015.

The Dublin Fire Brigade control centre has operated the emergency call prioritisation system, known as Advanced Medical Priority Dispatch System, for processing and prioritising emergency calls since 2005. The Fire Brigade control centre has been recognised as a centre of excellence for the use of its Advanced Medical Priority Dispatch System. The Review Team found evidence that Dublin Fire Brigade routinely quality assures and reports on a minimum of 3% of all emergency calls received, which is in line with international best practice.

The dual call-taking and dispatch role of control staff

The Authority explored the call-taking and dispatch processes in the Dublin Fire Brigade control centre. Unlike the National Ambulance Service, the Dublin Fire Brigade does not have clear separation between the role of call-taker and dispatcher. In practice, this means that the person who takes the emergency call also has the responsibility of dispatching the emergency resource. This arrangement is not in line with best practice as there is an inherent risk that the dispatch of an emergency resource can be delayed at call-taking.

This potential risk was highlighted in writing to senior Dublin Fire Brigade staff by the Authority during the review. In response, Dublin Fire Brigade informed the Authority that it had internally reviewed its current practice and was assured that there is no intrinsic risk. However, in light of the findings of the National Ambulance Service's commissioned investigation of incident 50379⁽²³⁾, international best practice and practices observed during the on-site component of this review, the Dublin Fire Brigade response does not provide the Authority with any assurance that the current system assures 100% reliability in timely response to all emergency calls. By way of example, the Review Team observed a control centre staff member take an emergency call which required him to stay in communication with the caller for a prolonged period of time. The level of interaction required did not provide the staff member with adequate capacity to be able to effectively organise dispatch of a resource. In this situation, the current Dublin Fire Brigade system requires the staff member to simultaneously attract the attention of one of their peers to aid in the dispatch process. This may rely on non-verbal communication and is not formalised. The control centre staff member in question struggled to immediately attract the attention of one of his colleagues, and he became increasingly animated, resorting to banging the desk to attract their attention in seeking assistance in dispatching an ambulance. This practice would not happen if roles were clearly demarcated.

The handover of calls from Dublin Fire Brigade to the National Ambulance Service

In 2013, Dublin Fire Brigade's control centre processed 81,432 emergency calls which required an emergency ambulance response. Interviews with staff, and data subsequently supplied to the Review Team, showed the Fire Brigade looked for assistance in coordinating a response in 26,920 cases in 2013 from the National Ambulance Service.

This happens when Dublin Fire Brigade believe that at the time of receiving the call they do not have a nearby resource available to send, or in fact they do not have any available resources at that time. It should be noted that at the time of receiving calls, Dublin Fire Brigade cannot see available National Ambulance Service resources due to a lack of interface being in place between both services' computer systems.

Both the Dublin Fire Brigade and National Ambulance Service have advised the Authority that they acknowledge difficulties with this process, and attempts have been made to overcome the reported difficulties. This has included the design and use of a newly agreed algorithm (or series of steps) which staff must adhere to when requesting and providing collective assistance. This algorithm intends to improve performance through use of a more formal communication process, and an earlier point of discussion about whether or not a National Ambulance Service resource is available, during the Dublin Fire Brigade and National Ambulance Service initial exchange of information.

However, having reviewed data from calls that were handled after this change in process, and from discussions with Dublin Fire Brigade and National Ambulance Service staff, it is clear that the algorithm does not fully address the root causes of this problem. As a result, avoidable delay in call handling and joint resource allocation persists. In short, the current process used remains unnecessarily convoluted, and does not address the fundamental issue of each service not being aware of the resource availability of the other's at any given time. Continued difficulties with this process are clearly shown through examination of the sequence of events for calls where interaction between both services is necessary.

Minutes of meetings and discussions with staff on the ground – from both the Dublin Fire Brigade and the National Ambulance Service – continued to highlight to the Review Team the potential benefit of the development of a joint dispatch desk for calls in the Dublin area. It was reported that this would act to pool the resources of both Dublin Fire Brigade and National Ambulance Service at the point of initial dispatch, to properly address this problem. Despite this potential solution being consistently put forward by staff, and even though a desk has been physically purchased by Dublin Fire Brigade to facilitate this, a joint dispatch function had not – as of September 2014 – been established.

The potential barriers to the establishment of such a desk were examined by the Review Team with both the National Ambulance Service and Dublin Fire Brigade. This identified that from an information communications technology perspective such an approach could be readily achievable.

Indeed, through the collective use of computer-aided dispatch training accounts, the potential for a joint dispatch function could be safely piloted in a non-live environment to explore the benefits and troubleshoot solutions. It was evident to the Review Team that the largest obstacle to the formation of such a desk comes from the ongoing ineffective working relationship between the National Ambulance Service and Dublin Fire Brigade.

Both ambulance services are public safety utilities funded by the State, who are commissioned to provide an emergency response to the public. Given that they are working in close proximity of each other, it is therefore unacceptable in this modern age that they are unable to develop and nurture effective professional working relationships to ensure the delivery of a timely, effective and integrated ambulance service in Dublin. This unacceptable situation must be immediately resolved.

Chapter 8 – Clinical governance

A fire-and-rescue based emergency medical service providing high-quality pre-hospital emergency care needs to apply the same principles of clinical governance that are required by a stand-alone ambulance service. Effective clinical governance and risk management, which reflect both the demands of emergency medical services and the other services provided by the Fire Brigade, are crucial to ensuring that patients receive reliably safe and effective care. Pre-hospital emergency care services should always be delivered to a high standard, regardless of the provider. Therefore, the Review Team focused on Dublin Fire Brigade's approach to clinical governance using the same definition of clinical governance as outlined by the Health Service Executive (HSE)⁽²⁴⁾, and under the same headings used in the review of the National Ambulance Service.

Findings

Accountability and governance

Dublin Fire Brigade is accredited by the Pre-Hospital Emergency Care Council (PHECC) to provide a pre-hospital emergency care service. All Fire Brigade staff involved in providing pre-hospital emergency care are likewise licensed to practise by PHECC on achievement of the appropriate educational and training standards. Ambulance crews are drawn from the complement of each of four watches that operate in the Fire Brigade, which as of May 2014 consisted of 826 firefighters trained to paramedic level, 36 further trained to advanced paramedic level and 50 trained to emergency medicine technician (EMT) level. These staff, which included paramedic trained officers, are provided with credentials by the Fire Brigade to use PHECC Clinical Practice Guidelines, in the same way as their National Ambulance Service counterparts, and are subject to the same fitness-to-practise regime with PHECC.

Emergency medical services in the Fire Brigade are internally managed by an emergency medical service support officer who reports to the Chief Fire Officer. The service also avails of input on clinical care matters from a part-time Medical Director who is a recently retired emergency medicine consultant. This Medical Director has worked with Dublin Fire Brigade for a number of years, and as a result, the Review Team was able to identify an approach to clinical governance which was somewhat more mature than that currently found in the National Ambulance Service. The Fire Brigade trains its own complement of firefighter-paramedics in collaboration with the Royal College of Surgeons in Ireland (RCSI). Advanced paramedics avail of training provided by the National Ambulance Service College.

Dublin Fire Brigade has a strong governance structure, including clear and effective accountability and reporting lines, which may reflect the military approach to organisational structure and management style which predominates.

It was evident during the review that this translated into a disciplined approach to the application of directives generated at a senior level into action at the front-line. Such an approach permeated into the Fire Brigade's approach to clinical governance of emergency medical services. For example, evidence of centralised decision-making in relation to clinical matters such as directives issued by the Medical Director or PHECC was often rapidly translated into action in the service. This approach was further aided by a station-and-watch structure which is conducive to rapid formal and peer communication in what is admittedly a smaller and more geographically contained service than the National Ambulance Service.

However, monitoring of clinical performance of firefighter-paramedics in the provision of pre-hospital emergency care on the ground remains underdeveloped. In short, clinical supervision of staff beyond that provided in initial training remains limited, albeit the high number of staff deployed to ECHO* and some DELTA** calls enables a high degree of informal peer support and indeed peer review. Although audit of patient care records is a continuous process in the service, clinical audit – in the conventional sense of supporting improvement in the provision of clinical care through the strategic use of information – is in an early stage of development. In addition, the Fire Brigade did not appear to have an overarching strategic vision for the service in relation to emergency medical services as agreed at a senior level, with the main focus of the Fire Brigade being on maintaining the current situation around the service currently provided. It is possible that the lack of a defined service level agreement has hindered this planning process.

In general terms therefore, Dublin Fire Brigade provides a cohesive, organised service which meets PHECC practice standards for training and education, and ensures a consistent approach to service provision given the effective execution of a centralised management culture. However, clinical governance of emergency medical services in the Fire Brigade is restricted due to limited monitoring of clinical performance beyond rudimentary patient care record audits, and the lack of a strategic vision for proactive clinical progression. While clinical directives issued by the Medical Director of the National Ambulance Service are reciprocally applied by the Dublin Fire Brigade, there is little interaction between the two services in relation to the coordinated progression of the clinical agenda for pre-hospital emergency care. Notwithstanding this limited level of direct interaction, it should be noted that both organisations provide expertise to PHECC to assist in its formulation of clinical protocols or policies, and the legal requirement for both services to follow direction from PHECC ensures standardisation in the provision of care through, for example, shared clinical practice guidelines.

* Patients who are in cardiac or respiratory arrest.

** Patients with life-threatening conditions other than cardiac or respiratory arrest.

Adverse incident reporting

Dublin Fire Brigade provided evidence to the Authority of a new policy for the handling of adverse clinical incidents which was first approved by the Fire Brigade in April 2014. This policy was very similar to the National Ambulance Service's policy in this field. The policy aims to promote a just approach to incident management and investigation, and an open system of incident reporting. In addition, the incident grading system is also the same as that used by the National Ambulance Service.

This policy outlines that clinical incidents are investigated by the Emergency Medical Service Support Officer for the Fire Brigade, with later discussion with the Medical Director of all incidents. In addition, all moderate, major and severe cases are immediately referred to the Fire Brigade's Medical Director for review and to immediately assess and manage the potential risk of a recurrent incident. In the absence of the Emergency Medical Service Support Officer, incidents are initially reviewed by the relevant operations district officer.

A quarterly report of adverse clinical incidents is provided to the Chief Fire Officer and Assistant Chief Fire Officers for review. Moreover, the policy outlines that the Chief Fire Officer and Assistant Chief Fire Officers would also regularly liaise with the Medical Director to effect any risk mitigation measures required in relation to emergency medical services as determined by the Medical Director.

Notwithstanding the fact that a written policy for the handling of adverse clinical incidents was not written until April 2014, it was evident to the Authority that an unwritten culture of incident reporting had evolved in the service over a number of years prior to the formalisation of structures. Staff at focus groups described an open approach to the reporting and handling of incidents, and they reported that they would not feel threatened in self-reporting an error. Furthermore, the system for dissemination of learning from internal incidents, as described to the Review Team, would appear to be strong and efficient.

Disseminating learning from adverse events

The Review Team asked the Brigade to provide information on the number and nature of adverse clinical incidents reported from January 2012 until April 2014. In total, 23 incidents were reported during this time frame, and a description of the measures enacted to resolve each incident was provided to the Authority.

It was noted that some of the adverse incidents recorded related to complaints received from service users or their families. These complaints may not have entirely related to an adverse clinical incident, but nevertheless they were screened in the same way to determine any clinical learning points.

A significant proportion of the adverse incidents related to self-reporting of medication error or near miss. This is in keeping with most clinical incident reporting systems in healthcare. Other areas included adverse events as a result of faulty equipment and adverse events arising from communication difficulties.

A total of six adverse incidents were deemed severe during this time frame and therefore escalated formally to the Chief Fire Officer for oversight and action.

Evidence provided to the Review Team demonstrated that learning from adverse incidents, that occur internally within Dublin Fire Brigade, is effectively shared throughout the organisation. In the case of directives that emanate from incident investigation, staff highlighted that communication across the service is rapidly disseminated via memos. These are read at the 'Slate meeting' which is held daily at the start of each watch, at every station, at 9am and 6pm. This system allows for the rapid and consistent dissemination of information to all staff across the service within days as each watch reports for duty.

While internal learning was identified, awareness of potentially practise-changing developments emanating from experience externally is less embedded. For example, there is no formal mechanism for learning from incidents identified by either Dublin Fire Brigade or the National Ambulance Service to be effectively shared with the other party. While the Brigade adopts the clinical directives issued by the National Ambulance Service, many of the learning points from the review into incident 50379 had not filtered into the practise of Dublin Fire Brigade, despite being potentially equally applicable. By way of example, while Dublin Fire Brigade was in compliance with the recommendations for advanced quality assurance (AQUA) reporting, the demarcation between the role of call-taker and dispatcher that formed a critical recommendation of the incident 50379 review report had not been enacted.

This represents a risk, especially given that Dublin Fire Brigade is in the process of employing and training a new grade of control centre staff with limited prior emergency medical service experience. This risk was highlighted to the service by the Authority during the review. However, Dublin Fire Brigade did not see any inherent risk in this long-standing practice and did not enact any mitigation measures to manage this risk. It is of significant concern to the Review Team that Dublin Fire Brigade has not acted to address this specific risk.

Moreover, the failure to effectively consider all potential risks – through learning from the National Ambulance Service's public reporting of a serious adverse incident – indicates a potentially insular approach to risk management which does not avail of every potential learning opportunity. Greater cooperation between both service providers is required to better manage risk for the benefit and safety of patients.

Complaint and compliment management

Dublin Fire Brigade has a comprehensive suite of policies and procedures for the handling of compliments and complaints. This system differs from that used by the National Ambulance Service as the Fire Brigade falls under the remit of Dublin City Council rather than the HSE, who has its own overarching policy on compliment and complaint handling. The Dublin Fire Brigade process is facilitated by a Complaints Officer, who is responsible for the full handling of complaints.

This individual reports directly to the Chief Fire Officer, and severe complaints will be dealt with more speedily. Complaints of an emergency medical service nature that require further investigation will include input from the emergency medical service support team.

Evidence was provided to the Authority in relation to complaints received by the service from 1 January 2012 to 30 April 2014 for the entire operation of the Fire Brigade, including its emergency medical service functions. During this time period, 34 complaints were recorded and responded to. Common themes included complaints relating to communication breakdown or the approach of staff in dealing with people using its service. Overall, the Dublin Fire Brigade estimate a complaint rate of 0.02% relative to the number of calls received annually.

The Review Team requested details in relation to service developments that have arisen from the management of complaints. The Fire Brigade was able to demonstrate a number of initiatives that had been enacted to improve services in light of feedback received in the form of complaints. However the Review Team was unable to determine the relative speed of response to complaints from the service on the basis of the information provided.

In addition to complaints, the Review Team requested that Dublin Fire Brigade provide information in relation to the number and nature of compliments received from 1 January 2012 to 30 April 2014. During this time period, the Fire Brigade recorded a total of 22 complimentary communications, which included record of positive stories reported in the media. These compliments included mention of the professionalism and compassion demonstrated by staff during the course of their duty.

Indeed, this professionalism in the provision of pre-hospital emergency care was clearly seen by the Review Team during the on-site component of the review when shadowing crews. It is likely that the number of compliments formally recorded by the Fire Brigade underestimates the gratitude expressed in person to staff on a daily basis by many more people who have needed its services.

An important component of any clinical governance programme is the practise of actively listening to people using services in order to identify good practice, and to learn from where things did not go so well. Dublin Fire Brigade has a long-standing history of actively soliciting feedback from previous service users and the public. Such an approach has included the commissioning of satisfaction surveys. For example, in 2007 the Fire Brigade commissioned a customer satisfaction survey by a market research company which identified a 96% overall satisfaction rate with the totality of the service provided. This included emergency medical services but was also a reflection of the wider service.

Dublin Fire Brigade is accredited by the National Standards Authority of Ireland to ISO Standard 9001:2008. As part of this process of continuous re-accreditation, the Fire Brigade conducts ongoing satisfaction surveys, with – at the time of this review – the most recent having been completed in 2013.

This survey was conducted using an internal resource, and it sought the views of 690 prior service users from recent months through the dissemination of a questionnaire. A response rate of 19% was achieved, indicating that the views of 131 prior service users were recorded.

The survey examined areas such as satisfaction with the speed and nature of call handling, including the usefulness of information provided by the call-taker in the period prior to the resource arriving on scene. Satisfaction with response times demonstrated an improvement in satisfaction (94%), compared to 89% satisfaction in the 2007 survey.

Specific assessment of patient satisfaction with the emergency medical service in relation to initial assessment and treatment on the scene was analysed, and shown to be over 90%. Overall satisfaction with the service was 99%, an improvement on 2007.

Clinical effectiveness and audit

The current model of care provided by Dublin Fire Brigade emergency medical service

Dublin Fire Brigade operates a fleet of 12 emergency ambulances from 11 stations on a 24-hour seven-day all-year (24/7) basis. Each emergency ambulance includes, at a minimum, one firefighter trained and registered by PHECC to paramedic level, with the usual practice being a crew of two firefighter-paramedics. Firefighter-paramedics rotate through the ambulance role for either a day or night shift during the progression of each three- to four-day shift block. This is in order to allow the collective maintenance of clinical skills amongst all staff. Advanced paramedics may be deployed as crew with emergency ambulances, fire appliances or alternatively may operate as solo responders to supplement the emergency ambulance response.

In addition to the emergency ambulance and solo responder vehicle complement, Dublin Fire Brigade also has a practice of routinely deploying a fire appliance (fire engine) to all ECHO** and some DELTA** calls. This practice transports an additional five firefighter-paramedics to the scene of an incident in addition to the ambulance crew. In some instances, the fire appliance arrives on scene before the emergency ambulance. Such a use of resources can act to improve first-response times to ECHO and DELTA calls relative to what might be achievable within the current complement of Fire Brigade ambulance resources. It should be noted, however, that transporting of the patient to hospital still needs to happen in an emergency ambulance.

* Patients who are in cardiac or respiratory arrest.

** Patients with life-threatening conditions other than cardiac or respiratory arrest.

The practice of fire appliance deployment was observed on site by the Review Team in a number of instances, and explored with the Fire Brigade via interview. It was explained to the Review Team by Dublin Fire Brigade that deploying a fire appliance significantly benefited the management of cardiac arrest as the high number of paramedics on scene made patient management easier. It was further highlighted that it is useful in instances of major trauma or where patient removal from, for example, a damaged vehicle may be required, and in situations where diverting traffic flow is necessary to enable the ambulance crew to safely provide care without fear of injury from passing traffic.

On assessing the appropriateness of this, the Review Team formed the opinion that in a small number of cases there may be a benefit in coordinated deployment of both a fire appliance and an emergency ambulance. However, the Team was not convinced of the need for routine deployment of a fire appliance for every incident outlined by the service. Dublin Fire Brigade is struggling to meet national response time targets through how it currently uses its resources as outlined in chapter 9. Use of fire appliances in this way represents an opportunity cost in terms of using resources which might be better served by greater emergency ambulance capacity.

Furthermore, the need for five to seven personnel on scene to routinely deal with cardiac arrest is not supported in evidence, and is not a practice used by most pre-hospital emergency care providers internationally.

Dublin Fire Brigade, in common with the National Ambulance Service, takes all patients – who ring for an emergency ambulance and consent to travel to hospital – to a hospital emergency department. This practice is not in keeping with the trajectory of travel exercised by ambulance services internationally as previously outlined in this report, and is not sustainable. The possibility for Dublin Fire Brigade to move away from its historical model of care was explored at interview. However, it was evident to the Review Team at the time of the review that the Fire Brigade was not planning to change the current situation where 100% transportation to the emergency department happens.

Dublin Fire Brigade currently only has 36 trained advanced paramedics, and is especially poorly resourced in this respect, even when compared to the National Ambulance Service. Movement of the model of care towards innovative approaches such as extensive 'treat and refer' will not be possible in Dublin Fire Brigade until the numbers of firefighter-paramedics trained to advanced paramedic level are significantly increased. Indeed, the current number of advanced paramedics is so low in Dublin Fire Brigade that providing an advanced response aligned with best practice set down by the Advanced Medical Priority Dispatch System for ECHO and DELTA calls cannot be reliably achieved.

Clinical audit

As with other providers of pre-hospital emergency care in Ireland, Dublin Fire Brigade records patient details using the PHECC patient care record form. As part of its internal quality assurance process, Dublin Fire Brigade has operated a long-standing process of continuous patient care record review. This is done by staff on light duties who review and record details related to each patient care record completed, one week in arrears.

The current process includes ongoing tracking of the form for completeness, alongside data relating to a number of important conditions such as out-of-hospital cardiac arrest, respiratory arrest and medication usage in childhood asthma. A comprehensive log of the medicines used is also recorded. Medication usage is also routinely audited against each relevant clinical practice guideline for their appropriateness. This system also allows for medication error to be identified and managed. In some cases, patient care records are set aside for more detailed clinical audit based on the condition recorded, or at the request of the ambulance crew.

In addition, at the time of this review, the Fire Brigade had recently begun a collaborative study with the Centre for Emergency Medical Sciences at University College Dublin to examine the incidence and characteristics of opioid overdose – for instance, heroin, morphine or methadone overdose – initially managed by Dublin Fire Brigade. This work is intended to be used as an initial baseline study to further inform a pilot programme involving the distribution nationally of the opiate antidote naloxone to targeted groups in an effort to reduce drug-related death.

Dublin Fire Brigade's approach to patient care record review demonstrates that clinical audit can be conducted within the constraints of the current paper-based record system. Indeed, the deployment of staff who work on light duties to assist in data collection is an innovative way of facilitating audit in a pre-hospital emergency care setting. In addition, targeted audit focused on a particular high-risk area in the case of opiate overdose, which is aligned with a clear vision for improving patient care and aimed at reducing patient mortality, is an excellent example of how the findings of powerful clinical audit can be applied to front-line practice.

Nonetheless, the current approach to review of patient care records by the Fire Brigade is very resource intensive, and a high proportion of effort relates to ongoing quality assurance of existing processes rather than targeted activity intended to improve clinical outcomes. Given the requirement for audit to drive improvement, there may be some merit in the Fire Brigade considering a more nuanced approach. For example, greater use of sampling techniques for quality assurance activities could allow resources to be diverted towards more targeted quality improvement efforts based upon specific patient population needs.

Prevention and control of Healthcare Associated Infection

Dublin Fire Brigade has a number of policies and procedures dedicated to the prevention and control of Healthcare Associated Infections. These were explored by the Review Team in practice. Adequate sluice facilities (where used and disposable materials are processed and any items that can be used again are cleaned and disinfected) were identified during the site visits, and staff were well informed in relation to the cleaning requirements for emergency ambulances. In addition, there is daily extensive cleaning of ambulances, and this is accompanied by regular deep cleaning. All ambulances were seen to have adequate alcohol hand-gel to allow for appropriate hand hygiene. However, as observed with the National Ambulance Service, it was common for Dublin Fire Brigade staff to routinely wear gloves during the course of their duties. Much of the usage of gloves appeared to be unnecessary, and awareness of the need to perform hand hygiene before and after glove usage was not routinely present.

Policies, procedures and guidelines

Dublin Fire Brigade is accredited by PHECC as a registered provider of pre-hospital emergency care clinical practice guidelines. These form the backbone of paramedical staff clinical practice. The Fire Brigade supports ongoing training and education of staff to include regular updates in relation to changes to clinical practice guidelines, and focused training on issues related to guidelines which emerge from patient care record audits, as being a particular problem or high-risk issue.

During the course of their duties, firefighter-paramedics regularly take part in team-based drills, which includes role play of an emergency-medical-services-based scenario. These drills are supervised by officers who use them as an opportunity to determine the baseline knowledge and skills of staff in relation to policies, procedures and guidelines.

Changes to policies, procedures and guidelines that are generated internally within the Fire Brigade undergo a formal structured process of internal review, which includes input from staff at all ranks, in line with requirements specified in ISO accreditation.

Managing performance

Paramedic training by Dublin Fire Brigade involves a high degree of clinical oversight. However, it was explained to the Review Team that following completion of formal training, it would be uncommon for practitioners to undergo clinical supervision. This was acknowledged by those involved in providing clinical governance oversight in the service as a weakness in terms of their ability to fully supervise staff. It should be noted, however, that firefighter-paramedics are much more likely to work in larger teams than other paramedical staff, and as a result they are afforded with a greater opportunity to work with more experienced peers.

This also allows for greater on-scene supervision by officers of staff to enable a degree of on-site assessment of performance to take place.

The Review Team established that Dublin Fire Brigade has the capacity to enable a programme of continuous training for staff which is embedded within the work programme. Such training allows for some degree of clinical oversight, especially in assessing staff competency in dealing with emergency-medical-services-based scenarios. However, given the broad range of fire, emergency medical and water rescue skills required by firefighter-paramedics, this degree of training is used through necessity to maintain a broad array of competencies which include, but are not limited to, emergency-medical-services skills.

In a work environment such as providing emergency medical and fire services, staff may be exposed through necessity to potentially hazardous conditions, or physically and psychologically demanding scenarios. Workforce welfare is therefore of paramount importance in maintaining high performance. As with the National Ambulance Service, Dublin Fire Brigade has established a comprehensive programme to deal with critical incident stress management which staff described as highly effective. This system is further supported through the efforts of a member of the firefighter-paramedic complement who has received additional training in psychological support. In more general terms, the Review Team noted that morale among the Dublin Fire Brigade workforce was generally very good, and this finding was further reinforced by the relatively low absenteeism rates, which were consistently below 4%. Likewise, staff turnover rates were found to be extremely low.

Management staff at interview outlined a programme of staff annual performance appraisal based upon the performance management and development system. This system is widely used in the public and private sector as a mechanism for the personal development and performance management of staff. It was explained to the review team that this is used to appraise performance across the entire range of firefighter-paramedic activities, including emergency medical services. However, such review does not include assessment of the clinical capabilities of staff. On-site observation by the Review Team of an albeit small number of crews providing pre-hospital emergency care showed a high level of clinical care, which was delivered in a sympathetic and compassionate way. However, the Fire Brigade's lack of a formal system of embedded review of ongoing clinical competency is a weakness in ensuring effective clinical oversight of performance.

Clinical governance oversight in Dublin Fire Brigade therefore consists of the current process of patient care record review, investigation of adverse clinical incidents and complaints, fitness to practise hearings, on-scene peer oversight, and feedback from emergency departments on clinical care. While Dublin Fire Brigade's current approach to clinical audit is welcome and provides good governance oversight of medication management in particular, this approach could be further refined to better inform staff performance appraisal if it is used as an educational tool.

Chapter 9 – Quality monitoring and performance

A high-quality emergency medical service requires effective assurance mechanisms to track performance over a number of domains. These domains need to be aligned to local patient population needs, but in general terms they will remain consistent across providers. The Review Team, in its assessment of Dublin Fire Brigade's emergency medical service, used the same methodology that it applied to the National Ambulance Service. This included a review of the service's approach to improving quality assurance mechanisms, and its approach to managing response times and performance against key performance indicators (specific and measurable elements of practice that can be used to assess the quality of care).

Findings

Dublin Fire Brigade quality measurement and performance

Although the National Ambulance Service provides significant but partial funding to Dublin Fire Brigade for ambulance services in the city of Dublin and many parts of County Dublin, there is no formal service level agreement in place between the two organisations to support this arrangement. As a result, the National Ambulance Service has no oversight of Dublin Fire Brigade performance, with the exception of publically reported data on response times.

Despite this lack of National Ambulance Service oversight, Dublin Fire Brigade does, however, have a system of internal quality monitoring which includes both clinical and limited operational measurement.

Clinical outcome performance measurement

As outlined in Chapter 8 of this report, Dublin Fire Brigade has had a long-standing process of continuous review of patient care record forms, which it undertakes for quality assurance and quality improvement purposes. The Fire Brigade measures return of spontaneous circulation following bystander-witnessed cardiac arrest as per the Ulstein comparator subgroup, in common with the National Ambulance Service. This measure is tracked internally every three months, with a performance target set at 40%. This means that it aims to achieve resuscitation in 40% or more of patients who fit into this comparator group by the time the patient arrives at the emergency department (ED). This target is regularly exceeded by the Brigade.

Dublin Fire Brigade also contributes to the national Out-of-Hospital Cardiac Arrest Register⁽⁷²⁾ which has previously been discussed in this report. Recorded performance for cases that present to Dublin Fire Brigade would indicate that survival to hospital discharge is broadly in line with international comparison for an urban setting.

It should be noted that as with the National Ambulance Service, Dublin Fire Brigade has contributed to the HSE's improved performance in the delivery of primary percutaneous coronary intervention (PPCI or stenting*) to heart attack patients (ST Elevation Myocardial Infarction or STEMI) in the Dublin area through collaboration with the national Acute Coronary Syndrome Clinical Care Programme⁽²⁷⁾. The service has also contributed to improved access for patients in the Dublin area to specialist stroke centres to allow more routine thrombolysis (breakdown of clots in blood vessels supplying the brain through use of medicines) for patients with occlusive stroke⁽²⁸⁾. Rapid thrombolysis both increases the chance of patient survival following a stroke, and reduces the potential impact of the stroke for survivors of stroke with respect to their ongoing quality of life.

The role that Dublin Fire Brigade has played in collaboration with acute hospitals to facilitate better access to both treatment modalities has been an important development in patient care and should be commended.

Response and deployment – performance measures

The ambulance service provided by the Dublin Fire Brigade responds to emergency 999 and 112 calls only, and is not involved in responding to general practitioner (GP) urgent calls or patient transfer calls between healthcare services which are handled by the National Ambulance Service. This allows the Fire Brigade to focus its ambulance control and operations functions almost entirely on emergency calls, with just under half of all of the ambulance calls it deals with being potentially life-threatening ECHO and DELTA calls.

The concentration and clinical seriousness of emergency calls responded to by Dublin Fire Brigade increases the potential clinical risk associated with any delay inherent in its processes and procedures for call handling, dispatch, mobilisation and deployment. The following sections will explore the Brigade's functionality in these critical process steps to enable a full assessment of response time performance.

Demand analysis and dynamic deployment

Dublin Fire Brigade provides an emergency ambulance service with 12 ambulances on a 24-hour seven-day all-year basis. In addition, this resource is supplemented with the deployment of a fire appliance (fire engine) response from stations for all ECHO and some DELTA calls, and a first response from a small number of advanced paramedic solo response vehicles. The large complement of Dublin Fire Brigade staff trained as paramedics enables the Fire Brigade to ensure that this level of response remains constant, even during staff meal breaks which are covered by colleagues. There are no dropped shifts (where some rosters are not filled to account for non-availability of staff).

* Using small mesh tubes to treat narrow or weak blood vessels carrying blood away from your heart to other parts of your body. See, <http://www.nhlbi.nih.gov/health/health-topics/topics/stents/>.

Any ambulance service can expect variation in demand, which in part and within a margin of safety can generally be predicted on the basis of the time of the day or the day of the week. For example, emergency ambulance demand can be expected to be high in an urban setting on Friday and Saturday evenings on account of alcohol-related incidents. Conversely, the early hours of the morning during the middle of the week will generally be times of reduced demand. In examining Dublin Fire Brigade's approach to the allocation of resources over the standard week, it was evident that the level of cover remains constant. This was a surprise to the Review Team as it would not reflect the practice of comparable ambulance services internationally, which look to match ambulance resources and availability to anticipated demand.

A full evaluation of the appropriateness of the Fire Brigade's approach to using resources to meet demand can only be done through an awareness of demand versus capacity. The Review Team anticipates that this issue will be examined in the HSE and Dublin City Council joint review of all aspects of the Dublin Fire Brigade ambulance service which is underway. However, currently there does not appear to be an approach by Dublin Fire Brigade to match anticipated demand to supply given the fixed nature of ambulance rostering. Dublin Fire Brigade should explore conducting a demand analysis as there is potential to better use current resources in order to provide more timely responses for patients, especially during periods of high demand on the service.

Internationally, ambulance services that monitor response times as a measure of performance rely on faster response times in urban centres within their geographic remit to improve the overall average time of response for the wider service. This is because the travel time distances to patients in urban areas are shorter. A key component of an urban-based emergency ambulance service's approach to ensuring rapid response times in particular is the use of dynamic deployment. As outlined in Chapter 8, dynamic deployment is the practice of identifying the best geographic locations to place emergency ambulances based upon historical demand for the time of day, day of the week or in response to specific anticipated demand. This requires the movement of ambulances to tactical deployment points on a continuous basis to best match the available resource to scientifically anticipated demand. Effective dynamic deployment improves response times for patients.

The Review Team examined Dublin Fire Brigade's approach to dynamic deployment during the review through:

- repeated on-site visits to the control centre at Townsend Street
- document and data review
- staff interviews
- shadowing of ambulance crews.

It is noteworthy that the pattern of Dublin Fire Brigade ambulance activity differed from that of the National Ambulance Service. Each Fire Brigade ambulance tended to undertake a high number of short missions on account of the volume of calls, and the shorter distances to arrive both on the scene and to transport patients to the relevant emergency department. National Ambulance Service ambulances tended to undertake a smaller number of longer missions in duration, and travel longer distances to and from calls, hospitals, and ambulance stations. Dublin Fire Brigade ambulances are commonly occupied in activity, with a regular average of approximately 18 calls handled per ambulance over a 24-hour period. As a result, the Review Team observed a regular practice of ambulances being deployed to calls shortly after becoming available, to take another patient following handover of patients to an emergency department. On other occasions, it was observed that the emergency ambulance would return to station following a call. The Dublin Fire Brigade do not avail of out-of-station tactical deployment points as a means to further improve response times, despite this being a major recommendation of an internally commissioned capacity review, previously undertaken on behalf of the Dublin Fire Brigade as far back as 2006. The findings from this capacity review were reported in the 2007 review of the provision of ambulance services in Dublin City and County and clearly demonstrated the potential benefit from adopting such an approach. With the exception of the intermittent use of two solo responder rapid response vehicles, dynamic deployment is not conducted by Dublin Fire Brigade. This mirrors the Authority's conclusion, as stated earlier in this report, that dynamic deployment as described internationally is not in use either by the National Ambulance Service or the Dublin Fire Brigade.

The general lack of dynamic deployment by Dublin Fire Brigade misses a significant opportunity for the service to potentially improve its response times for patients. Many of the stations which ambulances are deployed from are located in areas of Dublin City which are prone to traffic congestion, for example. Mobilisation from a standing start at a station misses an opportunity to cut vital response time which could be avoided through more tactical deployment which is better attuned to traffic flow. The fire stations with ambulances are located across the city, and their fixed locations do not allow for a more responsive pattern of deployment for anticipated increased demand that may be created due to national events for example, which would not be uncommon in a capital city. Most fire stations are historically located, and it is unclear if the deployment of ambulances from them is still fit for purpose given the significant change in Dublin's population over the past 20 years. More effective predictive analysis would better inform the Fire Brigade's approach to dynamic deployment, and it is anticipated that the ongoing capacity review will explore this further.

Given that Dublin Fire Brigade provides an emergency ambulance response in a predominantly urban area, it would be expected that the response times would be more likely to meet national response time key performance indicators than the National Ambulance Service, which covers largely rural and often quite sparsely populated areas.

Examination of national response time key performance indicators, which will be explored further in this chapter, would indicate that this is not in fact the case. The reasoning for this relatively poor performance may be multifactorial, and it is anticipated that the imminent capacity review will explore this in further detail. However, the impact of the efficiency in the call-handling process on response time performance, and the potential opportunity for improvement that may be achievable in concentrating on this aspect of patient care in particular will be explored as this chapter progresses. It is likely that better demand analysis and the use of predictive analysis to inform the routine introduction of dynamic deployment would also improve response time performance within current resources.

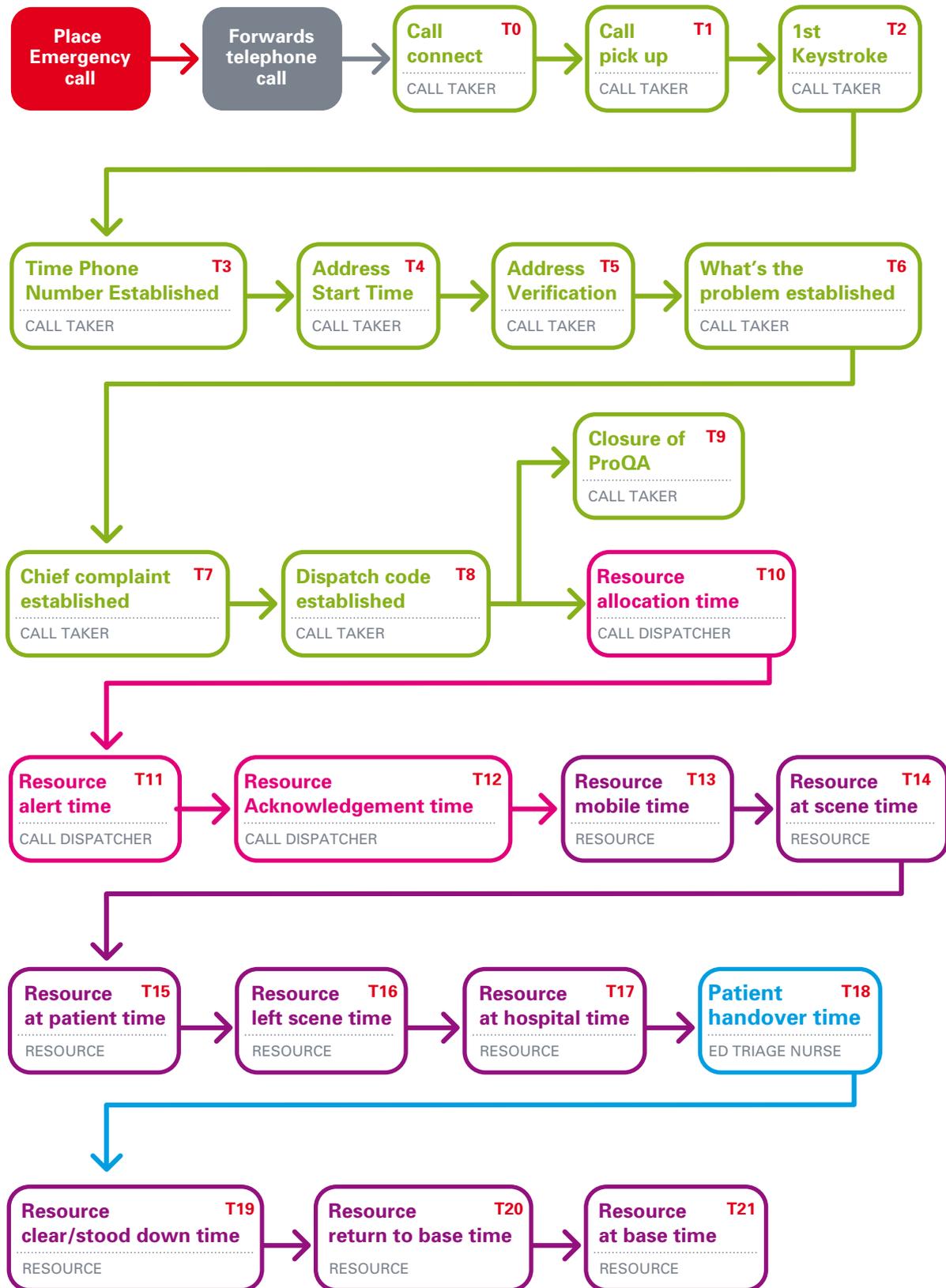
Pre-hospital emergency care – the patient pathway

In the time between a 999 or 112 call for an emergency ambulance being made, the patient being handed over to clinical staff in an emergency department, and the ambulance being made available to take another call, a consistent sequence of process steps needs to be efficiently and rapidly fulfilled to achieve timely, safe and effective management of the call.

Figure 8 illustrates each of these steps which – as already described in Chapter 6 in relation to the National Ambulance Service – are followed in sequence through use of the ProQA system (emergency medical dispatcher software), and activation of the accompanying ambulance dispatch process. The same process steps are followed in all ambulance services that use an Advanced Medical Priority Dispatch System, including Dublin Fire Brigade and the National Ambulance Service. These steps are followed in sequence to correctly define the location of the patient and the nature and seriousness of the patient's condition, to prioritise the call against the availability of resources at that time, and to ensure the patient receives the most appropriate and timely response.

Each step is assigned a time point or 'T' number from T0 to T21. This T annotation system is consistently used by all Advanced Medical Priority Dispatch System users, and it allows for both in-house and inter-service comparison of time performance in progression through each step.

Figure 13. Pre-hospital emergency care patient pathway



Dublin Fire Brigade's approach to call handling and dispatch

In assessing Dublin Fire Brigade's approach to call-handling, dispatch and mobilisation, the Review Team explored the call-taking and dispatch processes in place in the Fire Brigade's Townsend Street control centre. Unlike the National Ambulance Service, Dublin Fire Brigade does not have clear separation between the role of call-taker and dispatcher, despite this being a major recommendation of the report into incident 50379. In that incident, a National Ambulance Service ambulance was not dispatched to the scene following an emergency call, and following a sequence of additional events, the patient subsequently died in hospital a number of days later.

Despite this difference in role, the Dublin Fire Brigade call-taker and dispatcher still needs to progress through each 'T' step in sequence to fully process a call in the same way as the equivalent National Ambulance Service staff. However, Dublin Fire Brigade also avails of a 'pre-alert' for ECHO calls. This involves the call-taker and dispatcher automatically scrambling a resource directly from a station through activation of a station alarm and transmission of call address to a teleprinter located in the station, as soon as it becomes apparent in the call-taking process that the case is an ECHO call. This may mean that a resource is mobilised for the call in advance of the T8 step (when a dispatch code is established), which is intended to save time in the response arrival time. It should be noted that this 'pre-alert' cannot contact resources that are away from the station at the time of the alert being issued, and more conventional contact which takes longer is required in this circumstance.

Dublin Fire Brigade regularly looks for National Ambulance Service assistance in the handling of calls. As a result, the Dublin Fire Brigade call-taker and dispatcher may also spend some time after T12 (the point where resource allocation has been confirmed with the crew) on the same call if a Fire Brigade resource has been dispatched but when the call-taker and dispatcher feels the Fire Brigade's response time may be slow due to the distance between its resource and the scene. This additional effort may be needed to try to identify, in collaboration with the National Ambulance Service, if there is a National Ambulance Service resource closer to the scene than that already dispatched by Dublin Fire Brigade. In this situation, the call may be handed over to the National Ambulance Service, and the Fire Brigade's resource will be stood down.

On occasion, Dublin Fire Brigade may contact the National Ambulance Service to hand over a call if it does not have any resource to dispatch. In situations where the National Ambulance Service likewise has no resource to offer, the call will be 'queued' by Dublin Fire Brigade until such time as a resource from either service becomes available. This can result in significant delay for patients, and it was explained to the Review Team by senior members of Dublin Fire Brigade that this happens approximately 14,000 times each year.

In general terms, with the exception of the area north of Swords, the current system of resource allocation to call received by Dublin Fire Brigade results in a Fire Brigade resource allocation as the default first step, followed by supplementary response by the National Ambulance Service in the event that the Fire Brigade cannot meet demand. However, this system has no coordinated oversight of the best use of all resources (both Dublin Fire Brigade and National Ambulance Service) and is therefore inefficient in ensuring the fastest possible response for patients, through the best use of pooled resources.

As an example, during an on-site visit at the Townsend Street control centre, the Review Team witnessed a call received by Dublin Fire Brigade for a DELTA* incident in Clondalkin, southwest County Dublin. The nearest Fire Brigade resource available was in Tara Street in Dublin City Centre, not far from O'Connell Street Bridge. This resource was immediately dispatched to the incident, and the call-taker then contacted the National Ambulance Service to identify if it had a resource closer to the call. In this case, the National Ambulance Service identified a resource at its James's Street station in Dublin 8 which was both nearer to the incident and available. However, in the time it took to coordinate transfer of the call, and the decision to dispatch the National Ambulance Service resource from James's Street, the Dublin Fire Brigade ambulance from Tara Street was not only on its way but was now closer to Clondalkin than the James's Street ambulance. The National Ambulance Service resource was therefore not mobilised.

If a system existed where the nearest appropriate resource was allocated to an incident immediately in Dublin, regardless of whether it is a Dublin Fire Brigade resource or a National Ambulance Service resource, then the James's Street ambulance would have been dispatched at the outset. This would have resulted in a much quicker arrival time on scene than afforded by the current approach.

In addition, and as reported in Chapter 8 of this report, it is noteworthy here that at the time of receiving calls, Dublin Fire Brigade cannot see available National Ambulance Service resources due to a lack of interface being in place between both services' computer systems.

The poor coordination in shared use of resources in the call-handling interaction between Dublin Fire Brigade and the National Ambulance Service translates into slower mobilisation of resources for patients than might be achieved by a more streamlined process. The following sections explore this in further detail.

* Patients with life-threatening conditions other than cardiac or respiratory arrest.

Dublin Fire Brigade's performance in call-handling, dispatch and mobilisation

To enable the Authority to assess Dublin Fire Brigade's performance in call-handling, dispatch and mobilisation processes, the Authority's Review Team carried out a series of visits to its Townsend Street control centre. The Review Team observed practice, interviewed staff and reviewed policies and internal performance management processes. The interaction between Dublin Fire Brigade and the National Ambulance Service was specifically explored as part of this process through the tracing of calls handed over from one entity to the other, with cross-referencing of data from both services. To inform national response time key performance indicators, Dublin Fire Brigade submits data to the National Ambulance Service for further collation. In common with the National Ambulance Service, the Fire Brigade's performance against the transporting vehicle response time target of 18 minutes 59 seconds is currently publically reported. However, and as is the case with the National Ambulance Service, the 7 minutes 59 second target performance data is not publically reported by the HSE.

The Authority obtained internally validated Dublin Fire Brigade ECHO and DELTA call data from Dublin Fire Brigade's Townsend Street control centre over a 24-hour period from 08:00hrs on Friday 14 March 2014 to 08:00hrs on Saturday 15 March 2014, the first night of the St Patrick's Day bank holiday weekend for 2014. This period was chosen as it was anticipated that it would give an overview of the Fire Brigade's recent ability to cope with respect to call-handling and dispatch during a period of anticipated high demand for ambulance services.

In interpreting the data, the Authority used median data (which describes the middle or midway data point in each set of numbers) to describe performance as it was deemed to be a fairer representation of performance. This was because use of mean (average) data would be significantly influenced by a small number of outlier call-handling times in what is a small dataset.

Table 3 below details total number of emergency ECHO and DELTA calls managed by Dublin Fire Brigade and the number of emergency resources allocated over the 24-hour period from 08:00hrs on Friday 14 March 2014 to 08:00hrs on Saturday 15 March 2014.

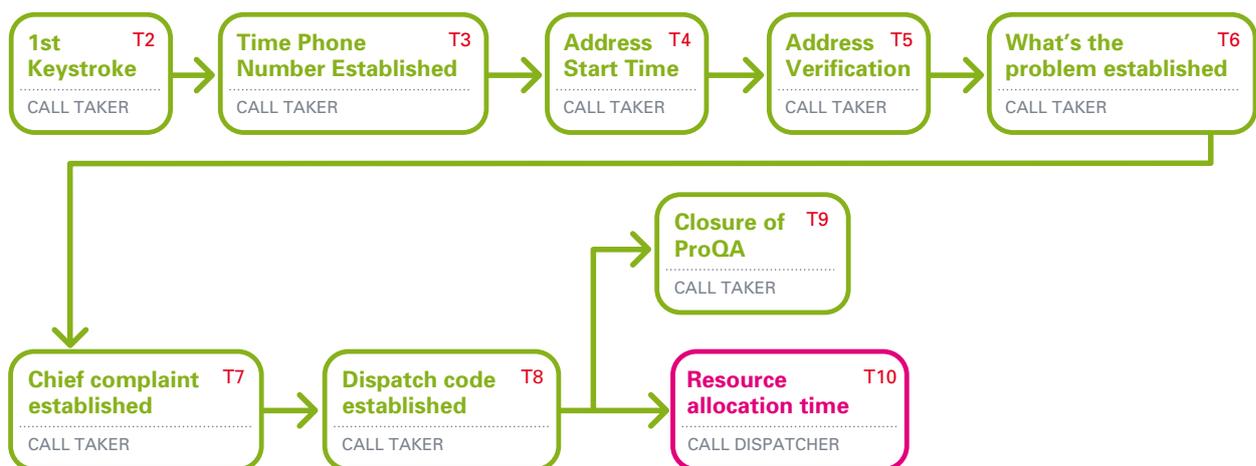
Table 3. Emergency ECHO and DELTA calls managed by Dublin Fire Brigade and emergency resources allocated from 08:00hrs on Friday 14 March 2014 to 08:00hrs on Saturday 15 March 2014.

24-hour 08:00hrs 14 March to 15 March 2014 – AS1 (emergency calls) ECHO / DELTA calls	Number of ECHO / DELTA emergency calls	Number of emergency resources allocated*
Dublin Fire Brigade Control Centre, Townsend Street	84	122

The following sections therefore outline the Review Team’s findings in relation to the handling of calls by critical call step over this time period.

Allocating a resource

Figure 14. Pre-hospital emergency care – patient pathway: T2 – 1st Keystroke to T10 – Resource allocation time



It is the responsibility of the Dublin Fire Brigade call-taker and dispatcher to allocate the nearest available appropriate resource to an incident in an efficient manner. If a Dublin Fire Brigade resource is unavailable or is available but is dispatched from a location that is a long way from the scene, the Dublin Fire Brigade call-taker and dispatcher may also need to contact the National Ambulance Service to secure a resource.

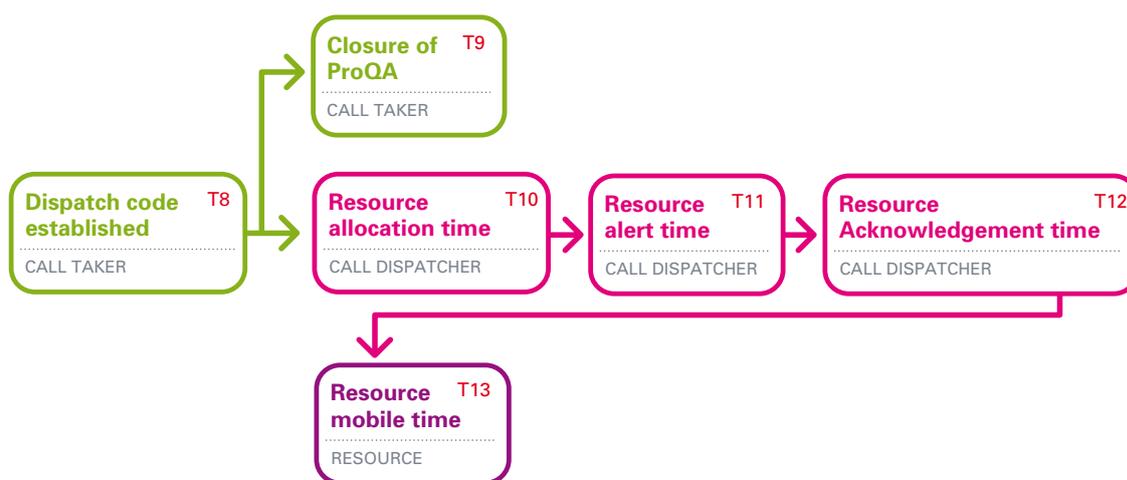
As with analysis of data provided by the National Ambulance Service, the Review Team assessed performance in the timeliness of resource allocation against a benchmark time of 90 seconds⁽⁷⁶⁾, which would be considered a reasonable benchmark target of average allocation time based upon international experience.

* Number of emergency resources allocated denotes number of resources allocated, for example; a rapid response vehicle, an emergency ambulance, or a fire appliance (fire engine).

Review of 24-hour validated data submitted by Dublin Fire Brigade for 14 March – 15 March 2014 demonstrated that only 14% of ECHO and DELTA calls were allocated a resource within 90 seconds from 1st Keystroke (T2), and the median time frame was 165 seconds.

Mobilising a resource

Figure 15. Pre-hospital emergency care – patient pathway: T8 – time dispatch code established to T13 – time resource mobile



Mobilisation time refers to the time it takes from the moment a dispatch code is issued to a call, to the moment when a crew starts to travel towards the incident in their vehicle. In the case of the Dublin Fire Brigade, this process step is supplemented after T13 by the practice of initial Fire Brigade resource mobilisation, followed in some instances by the joint call-taker and dispatcher contacting the National Ambulance Service to identify a nearer resource, and the subsequent standing down of a Fire Brigade resource should the call be handed over to the National Ambulance Service.

For the purpose of this analysis, the Review Team examined the time it took the Brigade to initially mobilise its resource (T8 – T13). This was intended to identify its efficiency in initial dispatch, notwithstanding the inherent delay presented by possible subsequent additional process steps in handing over the call to the National Ambulance Service who may need to repeat these series of process steps again. Review of the internally validated 24-hour data provided to the Authority by Dublin Fire Brigade demonstrated that 61% of resources were mobilised within the target 180 seconds set by the National Ambulance Service from time dispatch code established (T8 – T13). The median timeframe for mobilisation was 163 seconds.

Transfer of emergency ambulance calls from Dublin Fire Brigade to the National Ambulance Service

The Review Team was told by senior staff in Dublin Fire Brigade that on some days up to 50% of all emergency calls received by Dublin Fire Brigade may be delayed for various periods of time because demand has exceeded its capacity to respond. This results in Dublin Fire Brigade asking for assistance from the National Ambulance Service, which in 2013 amounted to 26,920 requests out of a total of 81,432 calls requiring an ambulance. This equates to just under one-in-three of all calls received. With this added process step, it was reported to the Review Team, and observed in practice, that delays can result from:

- a time lapse in the decision-making process to seek assistance from the National Ambulance Service
- the answering of the transfer call
- the National Ambulance Service deciding to take on the call
- the need for the National Ambulance Service to repeat the mobilisation process.

In 2013, a total of 8,076 calls were transferred to the National Ambulance Service by Dublin Fire Brigade in this way.

In some circumstances, the National Ambulance Service does not have a resource to offer at the time it is contacted by the Fire Brigade. In such circumstances calls remain in a queue until such time as a Dublin Fire Brigade resource or a National Ambulance Service resource becomes available. It was reported by the Fire Brigade that this happens with approximately 14,000 calls per annum. It should be noted that for very serious cases, resources will be diverted away from existing calls of a lower priority where possible.

The Authority examined evidence of these Dublin Fire Brigade requests for National Ambulance Service assistance for the 24-hour period of 13 September 2014. During this time period, Dublin Fire Brigade requested National Ambulance Service assistance on 40 occasions. Out of those requests:

- four were delayed for four minutes as a consequence of the process
- five were delayed by five minutes
- one was delayed by six minutes
- one by eight minutes.

Just over one-in-four calls therefore experienced a potentially clinically significant and avoidable delay as a consequence of the convoluted process employed.

This evidence, in addition to further information obtained by the Review Team, clearly demonstrates that the current process of coordination of call-handling between Dublin Fire Brigade and the National Ambulance Service does not function in the best interest of patients. This needs to be addressed as a matter of urgency.

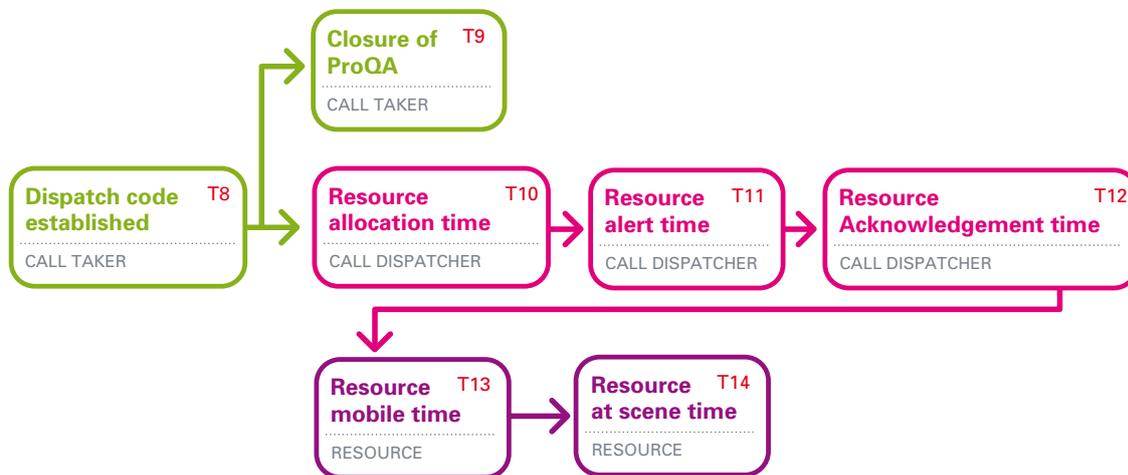
Opportunity for further performance management in call-handling and dispatch

It was evident to the Review Team that there was a relative lack of performance management in call-handling and dispatch in Dublin Fire Brigade's control centre. With the exception of advanced quality assurance (AQUA) on calls reporting which relates to call-taking accuracy in the use of the Advanced Medical Priority Dispatch System only, systems were not in place to alert control centre staff as to when they are performing well, or when performance could be improved. This is particularly important in relation to dispatch functions, especially given the dual functioning of call-taker and dispatch staff.

Despite this lack of specific feedback to individual staff on their performance, there is awareness at all levels within the complement of Dublin Fire Brigade's control centre staff that the systems in place to handle the transfer of calls to the National Ambulance Service are not always as efficient as they could be. Despite the fundamental issue of a lack of oversight of all ambulance resources in the Dublin area at the point of first dispatch being a key contributor to avoidable delay, the current systems aim to work around this problem rather than address it head on through coordinated inter-service cooperation. The Review Team is very concerned that a lack of communication between the National Ambulance Service and Dublin Fire Brigade in planning for the National Ambulance Service move from Townsend Street to Tallaght may further worsen what is already a dysfunctional system of cooperation. Much stronger collaborative planning between the two services is needed to ensure that this move by the National Ambulance Service to Tallaght happens without jeopardising the safety of either service.

First Responder on scene within 7 minutes and 59 seconds

Figure 16. Pre-hospital emergency care – patient pathway: T8 – time dispatch code established to T14 – time the first responder resource arrived at scene



The *Pre-hospital Emergency Care Key Performance Indicators for Emergency Response Times* sets out that all incidents which are categorised as ECHO or DELTA should have a first response for ECHO and DELTA calls in 7 minutes and 59 seconds or less in 75% of all cases.

The Authority reviewed data provided by Dublin Fire Brigade relating to the percentage of ECHO and DELTA calls responded to by a first responder in 7 minutes and 59 seconds, from January 2013 to March 2014 by Dublin Fire Brigade. This data indicated a best monthly average result for ECHO calls of 87%, and a best monthly average result for DELTA call of 55% recorded over this time period. All other monthly results fell below this. DELTA calls therefore never achieved the national key performance indicator response time targets during this time period.

In comparison with response times that are regularly achieved in urban settings in other jurisdictions, Dublin Fire Brigade’s performance in achieving an arrival on scene within 7 minutes and 59 seconds in the time period reviewed was relatively poor. In assessing response times, an awareness of capacity is a key consideration. As previously outlined, it is anticipated that the ongoing HSE capacity review will fully assess this particular issue. However, response time also relates to the speed of call-handling and dispatch, and the use of available capacity.

Dublin Fire Brigade does not routinely dynamically deploy its crews around the city, and it therefore does not avail of the benefit that may be afforded in terms of improved response times, which are all the more achievable in an urban setting. The fixed nature of ambulance deployment capacity on a 24/7 basis also suggests potential for a more scientific approach to matching anticipated demand with supply.

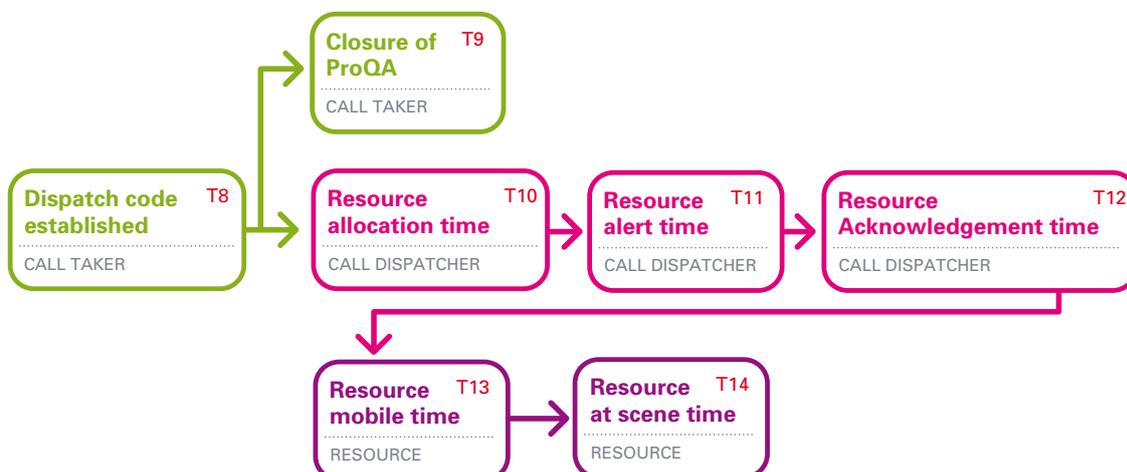
Better performance in call handling and dispatch could save minutes in overall response in some circumstances, and better performance management of this, together with the National Ambulance Service, would result in faster response times for patients.

Dublin Fire Brigade has acted in the past to try to improve first-response times through cooperation with external parties in the community. Most notably, the Fire Brigade established a pilot scheme with An Garda Síochána (the Irish police force). This included providing training and defibrillator equipment, and simultaneous alert in the case of ECHO calls (patients who are in cardiac or respiratory arrest) to try to organise a faster response for patients. This pilot project identified some limited benefit from this initiative. However, it was discontinued as in most cases Dublin Fire Brigade's response was faster on account of the Garda Síochána being engaged with its core remit, which affected its ability to rapidly respond. In an urban setting, the marginal gains from community first responder schemes are less than those that might be achieved in rural areas. In light of the findings of this review, it is likely that initial Dublin Fire Brigade investment in better performance management of call-handling and dispatch processes, in collaboration with the National Ambulance Service, would yield greater improvement in response times than might be achieved through extensive investment in external community first responder schemes.

The regular monitoring of the 7 minute 59 second target for an urban-based ambulance service in particular should be a key performance indicator. In common with the National Ambulance Service, Dublin Fire Brigade performance against this measure should be publically reported, and used to promote and support internal performance improvement.

Patient carrying vehicle within 18 minutes 59 seconds

Figure 17. Pre-hospital emergency care – patient pathway: T8 – time dispatch code established to T14 arrival of emergency resource (a patient-carrying vehicle) at the scene

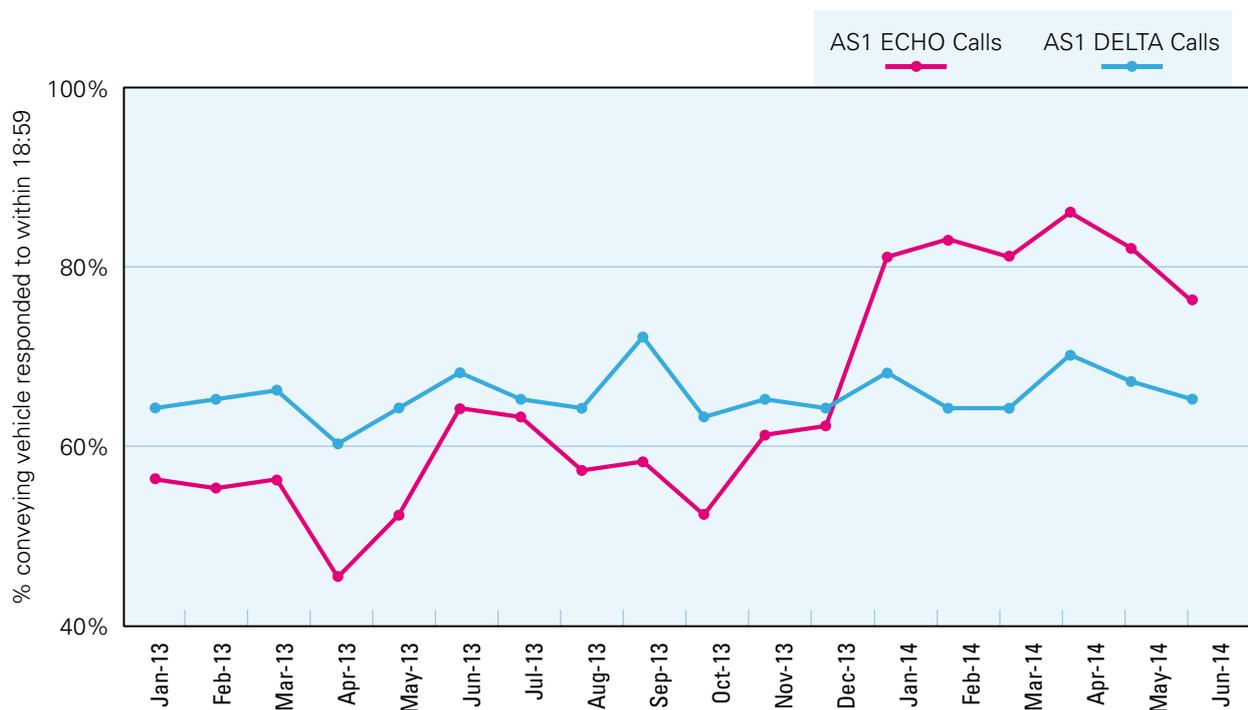


The *Pre-hospital Emergency Care Key Performance Indicators for Emergency Response Times*⁽⁴¹⁾ sets out that all incidents which are categorised as ECHO or DELTA should have a patient-carrying vehicle arrive on the scene within 18 minutes and 59 seconds. The National Ambulance Service has set the 2014 national service plan target at 80%^(79;91) for both the National Ambulance Service and Dublin Fire Brigade. Time is being measured from the point of dispatch code being established (T8) to arrival of emergency resource at the scene (T14).

The HSE publically publishes its National Ambulance Service response times for ECHO and DELTA calls for patient carrying vehicles which include Dublin Fire Brigade response times⁽⁸⁰⁾.

Figure 18 below details the percentage of ECHO and DELTA incidents responded to by a Dublin Fire Brigade patient-carrying vehicle within 18 minutes and 59 seconds from January 2013 to June 2014.

Figure 18. Percentage of ECHO and DELTA calls responded to within 18 minutes and 59 seconds, January 2013 to June 2014 by a Dublin Fire Brigade patient-carrying vehicle



Data source: HSE Performance Assurance Report. Note data reported one month in arrears.

The reported response times for ECHO and DELTA calls from January 2013 to June 2014 demonstrates that the service plan target was being achieved for ECHO calls only up to June 2014. It also shows that the service has seen a significant improvement in reaching the ECHO target relative to 2013 performance.

This improved performance was further explored with the Dublin Fire Brigade during the due process phase of completing this report. It was explained to the Authority by the Dublin Fire Brigade that as of January 2014, the functional definition applied to determine percentage performance in response to calls changed relative to all data points before this month. This resulted in a significant upturn in the reported performance for ECHO calls from January 2014 onwards.

The due process submission from the Dublin Fire Brigade explained that as of January 2014, a change in the way both the number of calls recorded are counted (the denominator), and the number of response vehicles that arrive on scene within 18 minutes and 59 seconds are counted (the numerator) occurred. The due process submission also indicated that this data may include fire appliances as being acceptable as a suitable response for the purpose of this indicator.

In reviewing the Dublin Fire Brigade due process submission in relation to this matter, the Authority was unable to verify the validity of this approach. Notwithstanding this, it should be noted that under the definitions outlined in the pre-hospital emergency care response time key performance indicator document, fire appliances are not considered to be conveyance vehicles, and should therefore not be counted as a response for the purpose of this measure.

Given the lack of clarity in relation to this matter, it is recommended that further efforts are made to improve transparency in the classification and reporting of this data for the purpose of public quality assurance and performance improvement. The Dublin Fire Brigade concede that this upturn in performance data has not resulted from an actual change in performance on the ground. It should be noted therefore that the recent reported improvement in overall national data, which includes Dublin Fire Brigade data alongside National Ambulance Service data, may have resulted from a reclassification of measurement methodology rather than any change in actual performance.

In interpreting this data, it should be noted that DELTA calls significantly outnumber ECHO calls in volume. In 2013, for every one ECHO call responded to by the Fire Brigade, there were just over 30 DELTA calls responded to. National key performance indicator targets focus on reaching a rapid response to both ECHO and DELTA calls. Dublin Fire Brigade consistently fails to achieve national response time targets for DELTA calls, that is for patients with life-threatening conditions other than cardiac or respiratory arrest.

Turnaround at emergency departments

Dublin Fire Brigade transports patients to some of the largest and busiest hospitals in Ireland, many of whom provide specialist care for the wider country for certain conditions. Many of these same hospitals have had long-standing problems with patient flow which have manifested as overcrowding in their emergency departments. As a result, and in keeping with the experience of the National Ambulance Service, delays in the handover of patients from Dublin Fire Brigade to hospitals have a significant impact on the ongoing availability of Dublin Fire Brigade emergency ambulances. Indeed, senior managers in the Fire Brigade reported to the Review Team that this has been a long-standing problem, and that it had calculated as far back as 2009 that delays in handover of patients beyond the target 20-minute handover time had resulted in a cumulative time loss of 225 wasted days of ambulance delays that year.

Despite this delay, and as also reported by the National Ambulance Service, efforts by the Dublin Fire Brigade to try to manage what is a complex and multiagency issue have been limited. The potential solutions to this problem involve closer coordination and communication between ambulance service providers and other system stakeholders, as outlined in Chapter 6.

It is imperative that the Dublin Fire Brigade acts in collaboration with the National Ambulance Service and other stakeholders to begin the programme of work required to fully address this issue. Dublin Fire Brigade is not involved in the handling of non-emergency calls, and do not have a role in patient transport. However, better coordination between both the National Ambulance Service and Dublin Fire Brigade, along with major hospitals dealing with very minor to very serious conditions, to identify patient flow problems and their management may help smooth out patient flow across the healthcare system.

Finally, as with the National Ambulance Service, reliance on taking all patients to hospital emergency departments for all Dublin Fire Brigade calls increases the likelihood of delay in handover. Movement to more novel approaches to patient treatment – without transporting all patients to the emergency department – would reduce pressure on emergency departments, and help reduce emergency department turnaround delays experienced by ambulances. This, for example, could include situations where patients may be better served through non-emergency department treatment options such as 'treat and refer' or transportation to non-ED healthcare settings, such as local injuries units.

Chapter 10 – Conclusions

Introduction to conclusions

Throughout this review process, it was evident to the Authority that there is a desire among staff of the National Ambulance Service, the wider Health Service Executive (HSE) and Dublin Fire Brigade to enhance and progress pre-hospital emergency care services for the benefit of patients. In addition, the Review Team was able to identify a number of practices which were of a high calibre across the services. At every point of patient care provided by both services which were observed by the Review Team, staff professionalism, compassion and a dedication to patient care were universally evident. This is to be commended.

Despite these positive findings, however, in general terms the current pre-hospital emergency care service provided by both the National Ambulance Service and the Dublin Fire Brigade is not as good as it could, or should be. It is the Authority's view that there is considerable scope for improvement within both services, even within existing current resources, notwithstanding separate areas which the Authority has identified require more extensive investment.

The following sections outline the Authority's overall conclusions from each part of the review for both services.

Conclusions – National Ambulance Service

National Ambulance Service governance

The achievement of high quality, safe and reliable pre-hospital emergency care is dependent on effective leadership, governance and management. Such leadership needs to ensure the service has sufficient capacity and capability to provide the service in the required way. In reviewing the leadership, governance and management arrangements of the National Ambulance Service, the Authority acknowledges that substantial governance and operational changes have occurred since the establishment of the National Ambulance Service. However, despite these changes, the seamless integration of eight services into one pre-hospital emergency care entity has not been fully achieved, and significant operational difficulties which result from the legacy of the merger of these services have not been corrected.

The National Ambulance Service has defined its strategic direction through a draft National Ambulance Service Strategy for 2014–2016. While this draft strategy outlines some important developments, there does not appear to be a sufficient focus on the need to redefine the model of care provided by the Service, which currently relies on transporting of all patients to hospital emergency departments (EDs).

Internationally, ambulance services are increasingly moving towards treatment over the phone or at the scene for some patients, with subsequent referral to other healthcare providers or discharge from clinical services as appropriate^(14;15). Such an approach, if used correctly, is better for patients and reduces the ever increasing demand on hospital EDs.

This transformation is dependent on having broad and effective clinical governance structures, as greater paramedic and advanced paramedic responsibility will require a higher level of oversight through ongoing audit and supervision. The National Ambulance Service's current clinical governance structures are at the early stages of development. The Authority recognises and acknowledges that further progression of the clinical governance approach will take a significant amount of time, effort and resource. However, it is essential that clinical governance in the National Ambulance Service is further developed to aid it in its progression towards a more appropriate model of care. The effective introduction of clinical audit will be vital in this regard. In addition, developing an overarching strategy aimed at achieving a much lower rate of patient transport to the ED – which includes an effective evaluation of workforce and training needs and expansion of clinical governance capability and capacity – will be required.

The provision of pre-hospital emergency care services by Dublin Fire Brigade and the future direction of pre-hospital emergency care in the Dublin region are not addressed in the National Ambulance Service's draft strategy. The current governance arrangements between the Dublin Fire Brigade and the HSE's National Ambulance Service remain inadequate, with a lack of quality assurance and accountability controls. This is complicated by the lack of a formal service level agreement between the HSE and Dublin City Council, who run the fire service.

Progress has been made in relation to undertaking some revision of executive governance structures for the National Ambulance Service. Notwithstanding these welcome developments, there are gaps in relation to effective performance management and a competency development system in place to support and develop the executive and management function of the organisation. In addition, there are gaps in assurance at both a corporate and executive level in particular in the area of risk identification, management and reporting of less severe clinical adverse events.

Implementing the National Ambulance Service Control Centre Reconfiguration Project is of critical importance to the National Ambulance Service. The Authority acknowledges that there are well defined structures and documentation in place to support this project. However, it is a significant concern to the Authority that the Assistant Director of Reconfiguration and Transformation, a critical member of the project team, has been reassigned to other duties and the vacant post has not been replaced as of October 2014. In addition, the lack of involvement of the Dublin Fire Brigade in planning for this extensive change is a significant concern.

While the transformation is a potentially positive development, it is essential that the National Ambulance Service effectively manages the change process, ensures that existing operational inefficiencies are effectively identified and corrected, and that the operational safety of all other remaining control centres is maintained during this process.

The National Ambulance Service faces a number of current and future risks that need to be safely negotiated. The absence of a clearly articulated strategic direction for ambulance services hinders effective planning. Therefore, service progression suffers as a result. Poor performance in response times increases the risk of potentially avoidable patient harm for many conditions, and manifests as a poor general service in many more instances. A failure to maximise performance improvement opportunities in, for example, call-taking and dispatch or through more comprehensive development of community first-responder schemes, means that these risks persist. The lack of appropriate systems and supports to develop staff management competencies runs the risk that the workforce may struggle to drive the changes necessary to enact the level of reform required to progress services for patients. Moreover, without full constructive cooperation between all staff groups in the service, meaningful reform will not occur.

National Ambulance Service clinical governance

It is vitally important that the HSE's joint Chief Operating Officer and Deputy Director General, the Director of the National Ambulance Service and its Medical Director work together to embed widespread and effective clinical governance structures and assurance mechanisms throughout the National Ambulance Service. Staff at all levels in the National Ambulance Service also have a professional responsibility to cooperate and proactively lead improvement in risk management and clinical governance on the ground, in the best interest of the patients they serve. While clinical governance is the responsibility of all working within the service, it is essential that the clinical governance function is effectively structured and resourced.

The Authority was informed that the Service had acted to try to improve its corporate and clinical risk management capability through the recruitment of a full-time dedicated risk manager. It is anticipated that this person will take up position in late 2014. The creation of such a role has the potential to further improve risk management performance in the Service and is to be welcomed. It is important, however, that the creation of this role is used as a catalyst for a wider coordinated approach to collective improvement to both corporate and clinical risk management, and clinical governance, and that risk management functions do not become compartmentalised into an operational silo. The current lack of clinical audit by the Service prevents it from effectively assuring itself that the best care is universally being provided. This is a significant concern. The Authority is of the opinion that there are additional requirements for a quality lead at senior level who, as part of their remit, are tasked with coordinating clinical audit.

Despite some recent progress, current risk management and clinical governance structures in the National Ambulance Service remain underdeveloped. The National Ambulance Service does not have strong and reliable structures in place to provide assurance that the clinical performance of practitioners and the wider service is the best possible. Some progress has been achieved recently in relation to the management of severe clinical adverse events in particular and clinical governance in general. However, it will take time to fully embed a more comprehensive risk management process should all stakeholders in the process follow through on their collective responsibilities.

The National Ambulance Service could do more to actively seek feedback from people using its services to proactively enable service development aligned with service-user expectation and needs. In addition, there is significant scope for further active communication with service users and other interested and informed parties. The National Ambulance Service needs to both develop and enact a comprehensive communication strategy to better inform the public about the service it provides, the clinical capability of its staff, and the need for appropriate usage of ambulance services.

During this review, it was evident that the pace of change in relation to the implementation of many of the measures identified as being required from a clinical safety perspective has been at best slow. Furthermore, full implementation of learning from recent serious incidents had not been enacted across the service at the time of the review, which was of concern to the Authority.

National Ambulance Service – information systems and fleet management

Information systems are critical to the operational management of an ambulance service. Through the National Ambulance Service Control Centre Reconfiguration Project there will be a number of enhancements to technology that are a welcome development. One key system for the National Ambulance Service is a single computer-aided dispatch system. This technology will enable the National Ambulance Service to operate as a single service. At the time of this report, there are still a number of separate computer-aided dispatch systems in place nationally which are not integrated. This means that they operate within a defined geographical area with no oversight of the other areas. The lack of integration and service oversight potentially means that ambulance resources are not being used in the most advantageous way.

In addition, in the Dublin area there are two separate control centres: one operated by the National Ambulance Service and one by Dublin Fire Brigade. Previous reviews conducted into the parallel functioning of both services have recommended the need to implement a joint dispatch desk to coordinate activity and provide oversight of each other's resources. However at the time of this review, which is 21 years after the original 1993 Review of Ambulance Services that outlined the need for greater cooperation, this had not happened.

The current risk this arrangement poses to patients, the tangible failure to mitigate the risk and the lack of meaningful engagement between these two public services raises significant concerns for the Authority.

Another key concern is practice related to incident address verification and inadequate satellite navigation systems. While the former is complicated by a current lack of postcodes, there are measures that the National Ambulance Service can put in place to improve address verification. These include regularly updating its gazetteer, ongoing audit and the provision of regular intensive training to call-taking staff. In relation to inadequate satellite navigation systems, it is the intention of the National Ambulance Service to implement emergency-vehicle-grade satellite navigation systems. While this is a positive development, there are no firm timelines for this. Improved address verification practices and the introduction of satnavs could aid to improve ambulance response times with limited investment.

Currently the National Ambulance Service predominantly uses paper forms to record patient data which makes it difficult, but not impossible, to report on patient outcomes. However, there is a long-term plan to implement an electronic patient record. While there are major information communications technology projects in development or at the planning stage to enhance its service, the National Ambulance Service does not have a specific information communications technology strategy. Such a strategy should set out the vision for improving healthcare through the appropriate use and management of information and the systems which underpin it over a period of time. It should support the service in delivering its business objectives with the patient at the centre.

In relation to fleet management, providing pre-hospital emergency care depends on a safe, effective and reliable fleet. Having a single fleet procurement and replacement programme is a positive development. However, through focus groups, on-site visits and interview it was reported that there were a high number of vehicle breakdowns. Staff perceived these to be as a result of a reduction in adequate investment to facilitate turnover of vehicles. In addition, there is no central reporting of vehicle breakdowns and consequently there is no real-time leadership overview of fleet maintenance. The National Ambulance Service fleet is ageing and its replacement plan is running behind schedule. This affects the fleet's ongoing reliability. Further investment will be required to keep pace with demand.

National Ambulance Service Workforce

The workforce of the National Ambulance Service is its key resource and asset. The Director of the National Ambulance Service appointed an internal manager for human resources (HR), who is part of the Leadership Team in 2013. Since this appointment, significant strides have been made to centralise the HR function, ensuring consistency in HR messaging, industrial relations, reducing staff absenteeism levels and standardising rostering practices.

In addition, the presence of the Human Resources and Organisational Development Strategy (2013–2018) is also a welcome development. This strategy outlines the challenges faced by the Service in order to centralise disjointed regional functions. However, the strategy lacks details with respect to the specific workforce resources required to support the service. The Service struggles with respect to workforce planning as the level of information currently collated centrally in relation to the workforce is limited. Its workforce strategy will be further informed from the output of the capacity review as this level of information has not been available to date to facilitate planning.

While there has been a recruitment drive for both call-takers and intermediate care operatives, the fall off in recruitment of paramedic trainees is of concern to the Authority, as recruitment has not kept up with the rate that paramedics leave the service. This problem needs to be addressed to prevent further deterioration in workforce numbers for an already stretched service.

The level of training and the scope of practice amongst the National Ambulance Service workforce has increased significantly from a clinical perspective over the past 15 years. This has been a positive development for patients as it has improved the treatment that they routinely receive. This progression has been led by the work of an effective National Ambulance Service College, a network of dedicated education and competency assessment staff, and the enthusiasm and commitment of staff themselves. The Pre-Hospital Emergency Care Council has also played an important role in providing an additional external drive for this development. While there has been progression over this time frame, the rate of improvement has slowed of late as access to training has been hindered due to a reduction in the relief factor for operations staff. In addition, while the service has a high capacity and capability for the clinical training of staff, training and development for managers and those in leadership positions is underdeveloped and needs to be enhanced. In general terms, it was evident to the Review Team that the National Ambulance Service needs to improve its overall approach to workforce strategic planning, together with the wider HSE.

National Ambulance Service quality monitoring and performance

The National Ambulance Service needs effective assurance mechanisms to measure its performance, to both recognise when it is performing well and to identify when and where it needs to improve. The National Ambulance Service has made some progress in recent years in its ability to monitor performance, both with respect to response times, and through the gradual introduction of clinical performance indicators. It is important to note that while response time is one important factor in determining the quality of pre-hospital emergency care experienced by a patient, other factors also play a pivotal role in ensuring that the best possible patient outcome is achieved. There is considerable scope for the National Ambulance Service to make better use of the data available to it to inform improvement efforts.

The National Ambulance Service struggles to meet national response time key performance indicators. Nevertheless, there is substantial potential to improve performance within current resources through better performance in call-handling, dispatch and mobilisation, and better strategic use of resources through effective utilisation of predictive analysis and demand analysis. Comprehensive introduction of dynamic deployment would also improve performance. The service has acted to introduce intermediate care vehicles over the past year which has been very successful in allowing it to free up significant emergency ambulance capacity. While movement to a consolidated control centre based across two locations in Tallaght and Ballyshannon may aid in providing an infrastructure to better facilitate improvement in each of these key facets of performance, without a more effective performance management culture across the service, overall performance will not significantly progress. Moves to foster such a culture should begin now, in advance of this planned move.

It should be noted that in many rural areas, it will not be possible for the ambulance service to meet first-response times of 7 minutes and 59 seconds in all circumstances, even with the best use of resources and if other performance enhancement measures were fully utilised. An extensive, strategically targeted expansion of community first-responder schemes is required to better meet the needs of patients in these areas who present with certain life threatening conditions. Such an expansion will supplement the ambulance service in the interest of patient safety. As a key stakeholder, the National Ambulance Service could and should do more to promote this agenda.

The Ambulance Service also needs to take a more collaborative approach with hospitals to address the issue of hospital turnaround time delays to further free up vital resources. This complex issue, which relates to patient flow through the system will require a coordinated approach, with all interested and informed parties working together over a period of time to relieve pressure on the ambulance service. It is important that the ambulance service effectively engages with all stakeholders in a systematic and comprehensive way to fully address this problem.

Conclusions – Dublin Fire Brigade

Dublin Fire Brigade leadership, governance and management

Despite the National Ambulance Service providing significant funding to Dublin Fire Brigade to provide an emergency ambulance service in the Dublin region, the National Ambulance Service has no oversight of Dublin Fire Brigade practice in the use of this funding beyond nationally reported response times for key performance indicators. Providing this funding has been a long-standing arrangement, with a memorandum of funding between both parties only established in 2012. However, no formal service level agreement exists between the National Ambulance Service and Dublin Fire Brigade. The fire service is dependent upon the outcome of the joint HSE-Dublin City Council review of ambulance service provision in Dublin to further inform its strategic progression. Without such direction, the service will continue to be hampered in its ability to plan and develop in the medium to long term.

Cooperation between the National Ambulance Service and Dublin Fire Brigade is limited, and as a result the provision of ambulance services in Dublin does not always make best use of the collective resources that may be available to respond to calls. This can result in an avoidable delay in response for some patients. Dublin Fire Brigade regularly needs to ask for assistance from the National Ambulance Service in providing a timely response for patients, but on regular occasions neither service has an available resource. In this situation, which happens approximately 14,000 times a year, the call is queued until such time as a resource becomes available.

The current arrangement where neither service has oversight of the others' available resources at the point of dispatch means that avoidable delay in response occurs through the transference of calls from Dublin Fire Brigade to the National Ambulance Service. The need for a joint dispatch desk to pool resources has long been recommended as a potential solution to this problem. Despite this, at the time of the review no such joint dispatch desk had been established. It is imperative that both services work more closely together to provide a more coordinated service in the best interest of the public.

Dublin Fire Brigade clinical governance

Dublin Fire Brigade benefits from using a number of long-standing arrangements in relation to clinical oversight, the handling of clinical adverse incidents and ongoing patient care record review which have provided it with an embedded baseline clinical governance infrastructure. There is a healthy culture in relation to the identification, reporting and investigation of clinical adverse events and near misses which is aligned with international best practice. However, Dublin Fire Brigade could do more to learn from severe incidents investigated by the National Ambulance Service.

It was evident to the Review Team that findings and learnings from severe events that the National Ambulance Service had investigated, and which likewise had potential implications for the Brigade, had not been fully used by the Fire Brigade to further improve its practice. For example, the undertaking of the dual roles of call-taker and dispatcher by one post-holder remained in place in Dublin Fire Brigade despite the recent findings of incident 50379 in the National Ambulance Service, which highlighted the need to separate these functions in the interest of patient safety.

The service has capacity to enable ongoing training throughout the working year for staff. This allows for the continuous identification and targeting of weaknesses and the consolidation of strengths. Dublin Fire Brigade's use of staff resources to facilitate patient care record review has proven an innovative way to provide some basic measurement of clinical activity, and a focus for further audit. The Fire Brigade has begun to introduce a more advanced, targeted and clinically-focused approach to clinical audit and improvement, most notably in relation to audit of opiate overdose. This is to be commended, and further expansion of this approach will continue to yield benefits for patients. In addition, the Dublin Fire Brigade has demonstrated a proactive approach to seeking service-user opinion on the service that it provides, which also deserves recognition.

While there is some measurement of clinical performance indicators by the Brigade, there is scope for further expansion for this suite of indicators to include other aspects of the service, to provide a better overview of clinical performance for both assurance and improvement purposes. Finally, while it is acknowledged that there are some mechanisms for the identification of poor clinical performance by staff following initial training, there is a need for greater post-qualification oversight of clinical practice through greater in-service observation and feedback.

Dublin Fire Brigade quality monitoring and performance

Dublin Fire Brigade has made significant progress in recent years in its ability to measure and monitor performance across both clinical and operational domains. This has allowed it to develop an understanding of what it does well, and where it needs to improve, especially in the context of its clinical audit approach.

The Fire Brigade has demonstrated recent improvement in reported response times to ECHO calls (patients who are in cardiac or respiratory arrest), but greater clarity is required as to how differences in the way performance is quantified and measured in 2014 has occurred relative to previous years, to enable a full assessment of the significance of this from a patient perspective. Dublin Fire Brigade performs relatively poorly with respect to response time Key Performance Indicators for DELTA calls (patients with life-threatening conditions other than cardiac or respiratory arrest) which are much more numerous, especially given that urban response times should be expected to be significantly better than those achievable in more rural settings.

While capacity is outside of the scope of this review, the Review Team noted that the lack of dynamic deployment by the service and an apparent lack of demand analysis to effectively match likely demand with resource availability mean that the Fire Brigade could potentially improve performance significantly within current resource should these measures be enacted. Greater performance management of the call-handling process and the demarcation of the roles of call-taker and dispatcher would likewise improve performance in response times.

The ongoing lack of coordination in the pooled use of resources in Dublin between Dublin Fire Brigade and the National Ambulance Service means that persistent avoidable delay in an emergency ambulance response to the scene of a call-out occurs for many patients annually. Both services need to work together as a matter of urgency to improve collective oversight of resources at the point of initial dispatch. This move to greater meaningful cooperation is of additional importance at the present time, as the Review Team is very concerned that a lack of consultation by the National Ambulance Service with Dublin Fire Brigade in the planning of transition to the Ambulance Service's new control centre in Tallaght may compound what is an already dysfunctional arrangement.

Appendix A – Methodology

Overall approach

A guide for this review, which included review objectives and sample lines of enquiry, was developed by the Health Information and Quality Authority (the Authority). This was published in April 2014 and shared with the National Ambulance Service, and subsequently Dublin Fire Brigade, prior to commencement of the review, in keeping with the Authority's mission and corporate values.

Review Team

The then Minister for Health Dr James Reilly TD, with the approval of the Minister for Public Expenditure and Reform, approved the appointment of members of the Review Team as authorised persons to conduct the review, in accordance with section 70(1)(a) of the Health Act 2007 (the Act). Members included Authority staff and external representatives with expertise in pre-hospital emergency care services from Northern Ireland, England. Additional external advice was also provided by representatives from the New Zealand ambulance service.

Assessment framework

In accordance with the methodological approach, an assessment framework was developed by the Authority to guide the review approach. An assessment framework is a detailed description of the outcomes to be reviewed and the sources of evidence required in order to assess the compliance with the standards being monitored. The assessment framework detailed the lines of enquiry to be explored in order to assess compliance with the *National Standards for Safer Better Healthcare*. Lines of enquiry are the questions or prompts that the Review Team used to help inform the review. The lines of enquiry were framed around the National Standards' themes of quality and safety.

These themes reflect the essential components of a high-quality, safe healthcare service and encompass the required capacity and capability of the service provider to deliver such services.

The quality dimensions are:

- Person-centred Care and Support
- Effective Care and Support
- Safe Care and Support.

The capacity and capability themes are:

- Leadership, Governance and Management
- Workforce
- Use of Resources
- Use of Information.

Phases of the Review

The Authority's review process took place over four broad phases. These were:

- **Phase One:** documentation review and on-site review (April – September 2014)
- **Phase Two:** individual staff interviews and focus groups (May – July 2014)
- **Phase Three:** evaluation of information gathered and review findings (September – October 2014)
- **Phase Four:** documentation and on-site reviews of ambulance stations and each control centre (May – September 2014).

The Review Team wish to thank all staff involved for their assistance and cooperation in facilitating the undertaking of this review.

Phase One: documentation and data review

The Authority issued formal document and data requirements to the National Ambulance Service in accordance with Section 73 of the 2007 Health Act and subsequently to Dublin Fire Brigade, covering the following areas:

- corporate and clinical governance structure and management arrangements
- risk management systems including the reporting of adverse incidents
- lists of operational and clinical policies and procedures
- workforce management and staffing levels
- patient activity and patient outcome data in relation to emergency calls and or incidents.

The Authority also carried out detailed data analysis through viewing the sequence of events of 80 selected ECHO and DELTA emergency calls. A request for data was made to the National Ambulance Service and Dublin Fire Brigade relating to ECHO and DELTA emergency calls for the three-month period from 1 January 2014 to 31 March 2014 for selected geographic areas in Ireland, and a 24-hour period of 08:00hrs on 14 March 2014 to 08:00hrs on 15 March 2014 for the entire country. The Review Team examined this data and submitted a further request to examine the detailed sequence of events for a selection of calls from the above dates.

Additionally, during on-site observations of both control centres in Townsend Street in Dublin, the Review Team reviewed the sequence of events for a number of ECHO and DELTA calls that occurred in September 2014. This included a review of calls in the Swords area of County Dublin received by the Dublin Fire Brigade which corresponded with a visit by a member of the Authority's Review Team to the National Ambulance Service ambulance station in Swords on 10 September. This data was provided to the Authority during the on-site visit. Selected sequence of events for calls for both the National Ambulance Service and Dublin Fire Brigade were also requested and reviewed during on-site visit to the National Ambulance Service section of the Townsend Street control centre on 15 September 2014 and the Dublin Fire Brigade section of the Townsend Street control centre on 16 September 2014.

Dublin Fire Brigade requests assistance from the National Ambulance Service to respond to a number of emergency calls every day, so the Review Team cross-referenced the sequence of events for a selection of calls which required interaction between Dublin Fire Brigade and National Ambulance Service. Cross-referencing enabled the Authority to examine the interaction between both the National Ambulance Service and Dublin Fire Brigade. This also provided documented insight into the process used for the requesting and transferring of emergency calls, which allowed the Review Team to come to a conclusion about the cause of some delays in response to incidents in Dublin.

Phase Two: individual staff interviews and focus groups

During Phase Two of the review, the Authority conducted a series of six focus groups sessions with the National Ambulance Service (two each from its north Leinster, south and west regions), and two with Dublin Fire Brigade. These were to provide an insight into the operations of the services from the perspective of front-line staff. The focus group sessions were designed to provide contributors with an opportunity to freely express their views.

The groups included a representative sample of front-line staff, including emergency medicine technicians, paramedics, advanced paramedics, call-takers, dispatchers, control centre managers and station managers. Staff were selected using a randomisation process to ensure a fair representation of staff across all staff grouping category. The random selection process was designed to ensure minimal impact on the operational continuity of the services so that patient care and safety were not compromised. Each focus group session lasted 90 minutes in duration and the groups were held in Dublin (National Ambulance Service North Leinster Region), Cork (National Ambulance Service South Region) and Ballinasloe, Co Galway (National Ambulance Service West Region).

Focus groups were also held at the Townsend Street control centre in Dublin with Dublin Fire Brigade staff. Staff were selected to participate through randomisation from the 'Watch' on duty on the day in question. This provided a representative sample of staff from various stations around Dublin.

In addition to the focus groups, the Authority interviewed selected individuals from the National Ambulance Service, Dublin Fire Brigade, Dublin City Council and the Health Service Executive (HSE), whose role related to aspects of the governance structures and the quality and safety of services provided by both entities. This enabled the Review Team to clarify issues that may have been identified during the review of documentation and data; to gather information generally; to consider any further information provided; and to inform the review's findings.

Phase Two ensured that staff at all levels of each organisation were spoken with by the Review Team. Further engagement with staff continued throughout the review and included extensive discussion with front-line staff, control staff and managers at all levels during on-site visits across stations in every area and each of the services' control rooms.

Phase Three: evaluation of information gathered and review findings

Triangulation process and reporting of findings

The review involved the receipt and analysis of information from multiple sources including documentation and data, staff interviews and on-site observation. In making a judgment, the Authority used a process of gathering and analysing multiple sources of information to ensure that this judgment was informed by at least three separate sources of information, a process known as 'triangulation.' The Authority also conducted a review of international best practice to inform the review process and to support the findings.

Phase Four: on-site reviews

The Review Team conducted a number of on-site reviews which involved visiting a selection of ambulance stations around the country to observe station facilities, including sluice and vehicle cleaning areas, as well as observing clinical practice by accompanying paramedics during response to emergency calls. In addition, each of the National Ambulance Service's six control centres and the Dublin Fire Brigade control room were visited on numerous occasions in order to obtain information about the systems and structures in place to support the services provided by the National Ambulance Service and Dublin Fire Brigade.

The tables below illustrate the extensive on-site component of the Authority's review which was carried out by the Review Team:

Table 1

National Ambulance Service control centres visits
Ballyshannon Control Centre, Co Donegal – visited twice
Castlebar Control Centre, Co Mayo – visited once
Limerick Control Centre, Co Limerick – visited once
Townsend Street Control Centre, Dublin – visited four times
Tullamore Control Centre, Co Offaly – visited once
Wexford Control Centre, Co Wexford – visited once

Table 2

National Ambulance Service Ambulance Stations – all visited once
National Ambulance Service North Leinster
Athlone Ambulance Station, Co Westmeath
Dundalk Ambulance Station, Co Louth
Swords Ambulance Station, Co Dublin
National Ambulance Service South
Enniscorthy Ambulance Station, Co Wexford
Mallow Ambulance Station, Co Cork
Roscrea Ambulance Station, Co Tipperary
National Ambulance Service West
Ballina Ambulance Station, Co Mayo
Castlebar Ambulance Station, Co Mayo
Tuam Ambulance Station, Co Galway

Table 3

Dublin Fire Brigade Ambulance Stations visits
Swords Ambulance Station, Dublin – visited once
Tara Street Ambulance Station, Dublin – visited once

Table 4

Dublin Fire Brigade control centre visits
Townsend Street, Dublin – visited three times

In addition to the reviews of ambulance stations and control centres, the Review Team visited the National Ambulance Service College in the Phoenix Park, Dublin. This provided an insight into the education and training provisions for control-centre staff, emergency medical technicians, paramedics and advanced paramedics to ensure that staff are provided with the competencies and skills required to carry out safe and effective pre-hospital emergency care to patients.

Throughout each phase of the review, it is estimated that the Review Team cumulatively spoke at length with over 250 members of the National Ambulance Service, across all grades and functions, and from all geographic areas. This accounted for approximately 15% of the total workforce. It should also be noted that in many cases, staff that were spoken with at interview or at a focus group had often canvassed for and collated comments and views from their local colleagues in preparation for contribution to the review process. Therefore, the views of an even greater number of staff were expressed to the Review Team through the process. The Review Team also met with a significant number of staff from the Dublin Fire Brigade across all four 'Watches', with staff from all grades and functions included in the review process. It is estimated that approximately 10% of the Dublin Fire Brigade were spoken with by the Review Team during the review.

In order to acquire a better understanding of the escalation plans in place to manage patient flow and reduce ambulance patient handover delays at emergency departments, Cork University Hospital was also included in this on-site element of the review. The Review Team met with various members of staff and management, and visited the Cardiac Catheterisation Laboratory and the Emergency Department. This on-site component also allowed for an overview of Medico, the National Maritime Telemedical Assistance Service which is provided by Cork University Hospital Emergency Department staff. On occasion, this service provides telephone support to advanced paramedics in need of additional medical oversight when treating patients on scene, in addition to maritime-based work.

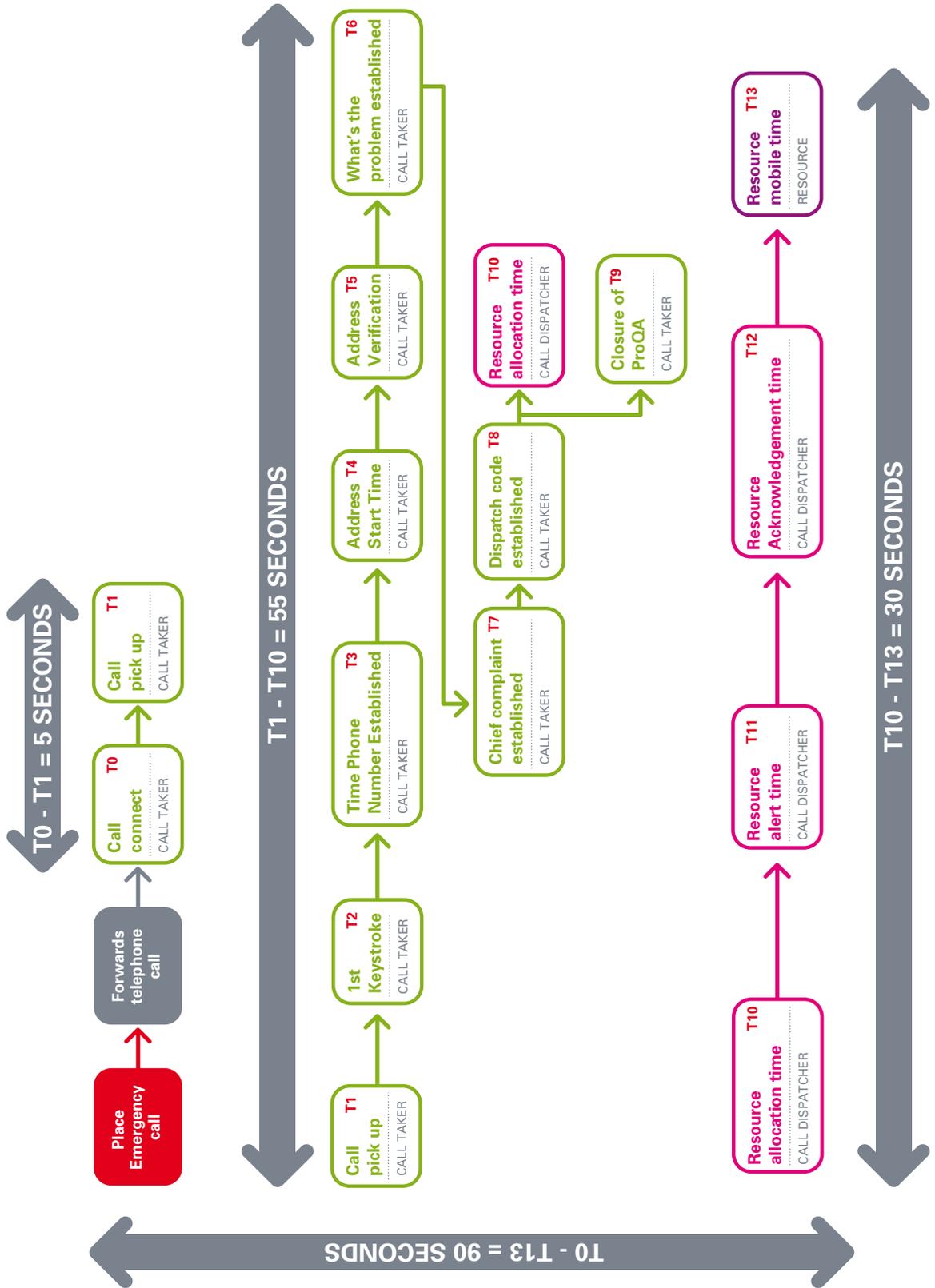
As part of this review, a number of community first responder schemes were consulted to provide greater insight into their role as part of the overall national approach to pre-hospital emergency care. This consultation was conducted through structured telephone interview.

Due process feedback

The Authority provided a copy of the confidential draft report of the review's findings in relation to the National Ambulance Service to the Chief Operating Officer/Deputy Director General of the HSE and also the Director of the National Ambulance Service for due process. Every comment received was carefully considered by the Authority prior to the publication of the report.

The Authority also provided a copy of the confidential draft report of the review's findings in relation to Dublin Fire Brigade's ambulance service to the Chief Fire Officer of Dublin Fire Brigade and also the Dublin City Council Chief Executive for due process. Every comment received was carefully considered by the Authority prior to the publication of the report. Both the National Ambulance Service and the Dublin Fire Brigade were provided with 10 working days to provide due process feedback on findings.

Appendix B – Call cycle average best practice times



External Review Team member biographies



Ken Wenman

Current position: Chief Executive, South Western Ambulance Service, NHS Foundation Trust, UK

Ken joined the NHS at age 21 years and has undertaken many senior roles within its ambulance service, including operational management and training. Prior to his appointment to the South Western Ambulance Service on 1 July 2006, his accomplishments included:

- Chief Executive of the Dorset Ambulance Service NHS Trust
- Deputy Chief Executive and Director of Operations for the former Westcountry Ambulance Services NHS Trust
- State-registered paramedic
- first Chairperson of the UK Council for Professions Supplementary to Medicine (the forerunner to the Health Professions Council)
- played a leading role in establishing the UK paramedic register.

Ken leads the UK ambulance sector nationally in the areas of human resources, workforce and operations for the national ambulance groups. He is also a member of the Board of the Association of Ambulances Chief Executives (AACE). Ken has a Masters in Management (Plymouth University). He is the nominated individual for the Care Quality Commission.



Dr Pamela Chrispin

Current position: Medical Director, West Suffolk Hospital, NHS Foundation Trust, and helicopter emergency medical service consultant with the East Anglian Air Ambulance Service, UK

Pamela is a consultant anaesthetist and intensivist by professional training, who has also worked in senior management and clinical governance positions in both acute hospital and pre-hospital emergency care settings. Pamela currently divides her time between her roles as Medical Director of West Suffolk Hospital, and clinical sessions as a helicopter emergency medical service consultant with the East Anglian Air Ambulance Service. Prior accomplishments include:

- Qualification as a doctor from St Bartholomew's Hospital, London in 1983. Qualifications are MB BS, FRCA MSc.
- Medical Director, East of England Ambulance Service, 2010-2013.
- Consultant Anaesthetist and Intensivist, West Suffolk Hospital 1998 – 2012.
- Pre-hospital volunteer with Suffolk Accident Rescue Service since 2005.
- Helicopter emergency medical service consultant with the East Anglian Air Ambulance since 2006.

Pamela was formerly a member of the National Ambulance Service Medical Directors group, and UK medical representative on the Standards Committee of the International Academies of Emergency Dispatch (IAED).



Gabriel (Gabe) Mc Clean

Recently retired: Former Assistant Director of Operations (Responsibility for Command and Control), Northern Ireland Ambulance Service

Gabe has extensive experience in the provision of ambulance services, gathered over 30 years of service with the Northern Ireland Ambulance Service (NIAS). Gabe joined the service in 1983, and began his career as part of the paramedic roster in Belfast. He became a station manager-paramedic supervisor in Belfast in 1985, and moved to control in 1996 to work as a dispatcher. He became a control centre manager in 1998 before becoming the Assistant Director of Operations with responsibility for Command and Control in 2004. He held this position for nine years before taking early retirement in 2013. As a qualified Project Manager Gabe has extensive experience in leading technology and IT change and transformation programmes for NIAS, including:

- leading the re-organisation and consolidation of eight ambulance control centres to two, and the introduction of an integrated command and control system to include a new computer-aided dispatch systems
- leading the introduction of the Advanced Medical Priority Dispatch System to NIAS
- introducing a system plan management programme for the development of predictive and demand analysis, targeted at achieving the most efficient use of sparse emergency resources
- identifying and introducing tactical dispatch points, dynamic deployment of ambulance resources, and use of 'hear and treat'
- creating and developing a control training and quality assurance department, and introducing control room performance management systems
- introducing an Emergency Admissions Coordination Centre for the coordination of all GP (general practitioner) urgent ambulance admissions

- introducing mobile data and automated vehicle location systems, linked to an emergency grade satellite navigation system
- introducing a front-loaded dispatch desk targeting RRVs at ECHO and DELTA calls, and introducing digital TETRA radio to improve control centre-crew communication.

Before retiring, Gabe was also the NIAS representative on the health system winter pressures group in Northern Ireland, which involved working alongside stakeholders from acute hospital trusts and the public health department to improve patient flow. Gabe was also a long-serving member of the UK ambulance services Control Centre Manager and AMPDS Working Groups.

Additional Review Team expertise was provided by staff of the Health Information and Quality Authority.

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