The Balance of Care Group

PA Consulting Group

Health Service Executive

Acute Hospital Bed Review

A review of acute hospital bed use in hospitals in the Republic of Ireland with Emergency Departments

4 May 2007

At PA Consulting Group, we **transform** the performance of organisations.

We put together teams from many disciplines and backgrounds to tackle the most complex problems facing our clients, working with leaders and their staff to turn around organisations in the private and public sectors. Clients call on us when they want:

an **innovative** solution: counter-intuitive thinking and groundbreaking solutions

a highly **responsive** approach: we listen, and then we act decisively and quickly

delivery of hard results: we get the job done, often trouble-shooting where previous initiatives have failed.

We are an independent, employee-owned, global firm of 3,000 talented individuals, operating from offices across the world, in Europe, North America, Latin America, Asia and Oceania. We have won numerous awards for delivering complex and highly innovative assignments, run one of the most successful venture programmes in our industry, have technology development capability that few firms can match, deep expertise across key industries and government, and a unique breadth of skills from strategy to IT to HR to applied technology.

• defence • energy • financial services • government and public services • international development
• life sciences and healthcare • manufacturing • postal services • retail • telecommunications • transportation

---

• strategic management • innovation and technology • IT • operational improvement • human resources
• complex programme delivery

Delivering business transformation

Summary

Summary

The Health Service Executive (HSE) is committed to ensuring that all patients are treated in the most appropriate health care setting.

In fulfilling this commitment, it is important for the HSE to develop a detailed understanding of the current extent to which patients are receiving care in the most appropriate environment, and for those that may not be, to identify and understand the underlying reasons, as this will subsequently enable the HSE to put in place the necessary measures to ensure that in future, more patients receive the most appropriate care in the correct environment. By means of specific example, the provision of a comprehensive range of appropriate alternatives to acute hospital care through the strengthening of services in the community would help hospital inpatients to return home more quickly and in some cases avoid acute admission altogether.

It was with this aim of gauging the demand for such services and support discussion of new care pathways and improved coordination of services both within and outside the hospital, that the HSE undertook this acute hospital inpatient bed utilisation review across 37 hospitals.

Introduction and overview of approach

PA Consulting Group (PA) and Balance of Care Group (BOC) were commissioned to undertake a study of acute hospital bed utilisation in Ireland. The objective of the study was to assess the extent to which patients in the adult medical and surgical acute inpatient setting within hospitals with an Emergency Department (ED), could potentially be treated in a more fitting (alternative to acute admission) environment and what alternative care settings are required to facilitate this. In order to meet this objective, a review was undertaken of the adult medical/surgical inpatient population in those hospitals with an ED throughout the country.

The review was undertaken using the Appropriateness Evaluation Protocol (AEP) tool. The AEP is an instrument which provides criteria for the evaluation of current care practice. Originally developed in the USA, it has been adapted for use in the UK and Europe and has been validated and found to be a reliable tool. The AEP enables an analysis of the reasons for *admission* as well as those for *continuing stay* in an acute care setting against a range of criteria. These criteria are then used as the basis of judging the appropriateness of that setting for individual patients in terms of the acuity of their condition or treatment requirements.

Put simply, the AEP process facilitates the determination of both

- Whether a particular patient should have been admitted to an acute bed, and
- Whether they should have been occupying that bed on the day of the survey.

The types of criteria used as a basis for this assessment therefore include those related to admission (severity of illness, intensity of service) and services on the day of care (medical, nursing and patient condition), and the assessment itself is based on an examination of patient records by appropriately trained and clinically qualified staff.

This review was conducted across the eight hospital networks (37 hospitals) between November 2006 and February 2007 (excluding the Christmas period). A total of 3035 patients were sampled using the AEP survey tool, out of a patient population of 8322, representing a sample of 36% of the patient population.

The AEP tool formed the core of the survey around which other information was sought, including questions about potential alternative care settings and whether they were currently available or not, and this information was used to identify *potential demand* for alternative services – irrespective of whether or not they currently existed.

A key feature of the process was the consultation sessions with each of the eight hospital networks to discuss the results and the underlying issues that influenced them, as this has informed the study as to the reality of the situations as experienced by the staff in the hospitals.

Key Findings:

(a) Patient Profile

The patients included in the survey were predominantly older and living at home with chronic illness and on multiple medications.

The patient profile data gathered during the survey provide a rich profile of admitted patients in Irish acute hospitals. Understanding the age profile, patient specialty, prevalence of comorbidities, time of patient arrival and source of referral is essential to informing a view of the strategies that would improve bed utilisation.

It was found that 63% of patients were aged 65 or over, and a high proportion (71%) presented with one or more comorbidity (hypertension, ischaemic heart disease and chronic obstructive pulmonary disease being the main three identified); in addition 52% were on multiple medications. The majority of patients (76%) were admitted from their own home. The principal referral source was the GP (36%) with 30% of patients self referring to the acute hospital.

(b) AEP Review – Day of Admission

The patients admitted outside the AEP criteria could potentially have avoided hospital admission and been treated elsewhere if alternatives were available. Surveyors identified possible alternatives to acute admission for these patients. These data are necessary to inform the strategies to improve bed utilisation and increase appropriate placement of patients. In addition, patients for whom the only AEP criterion identified was i/v therapy were also recorded, as professional opinion now suggests that many of these patients could receive such therapy outside an acute location for their underlying condition (eg i/v therapy in the home). I/v therapy was the only AEP criterion identified for 12% of all patients surveyed.

At a national level 13% of patients had been admitted outside the AEP criteria and could have potentially been treated outside an acute setting.

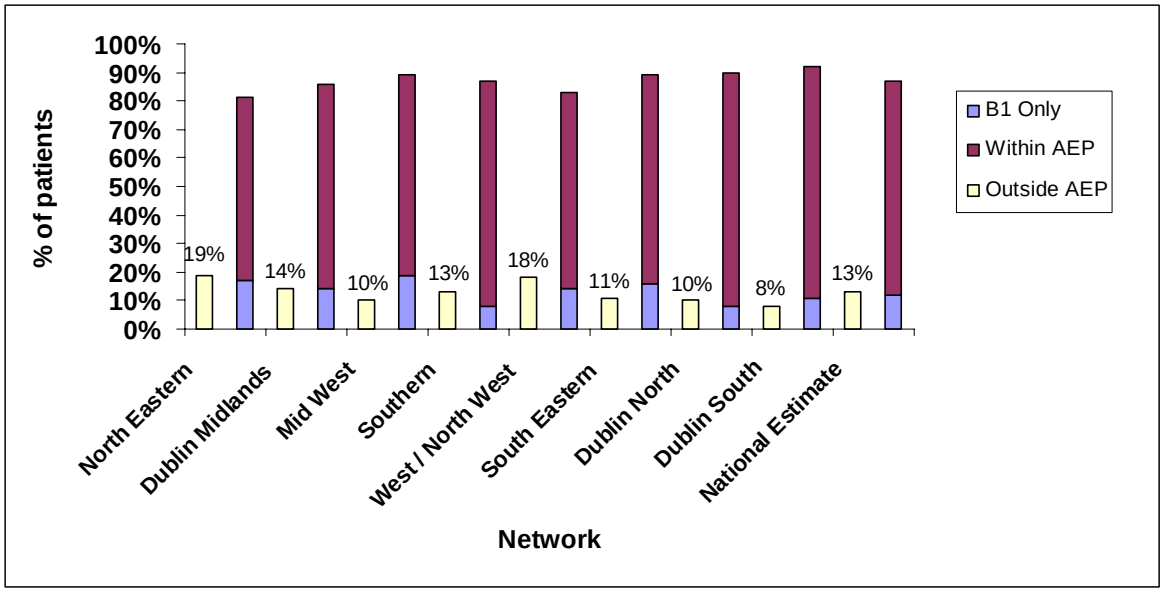
There was variation across the networks with the highest rates in the North Eastern (19%) and West/North West (18%) networks. Dublin South, Dublin North, South Eastern and Mid West networks had rates clustered around 10%. The principal alternatives to acute admission identified for these patients were, in order of priority:

- Access to assessment/diagnostics without acute admission
- Home-based patient care including GP support, therapy, specialist nursing, community nursing and home care packages
- Access to a non-acute bed with therapy support eg physiotherapy.

Of the elective surgery patients surveyed, 31% did not meet both the timeliness and location criteria set out in the elective surgery AEP. This means that the patient was admitted to the acute hospital earlier than necessary in advance of their surgery (timeliness criteria), and that the surgery could have taken place in a non acute-inpatient

setting, if an alternative were available (location criteria). The national average for patients that did not meet the timeliness criteria was 75%, and the national average for patients that did not meet the location criteria was 37%.

Figure E.1: AEP Results for Day of Admission



(c) AEP Review - Day of Care

The percentage of patients **outside** of the AEP criteria on their **day of care** shows the proportion of patients being cared for in acute hospitals on the day of the survey that could potentially have been treated in an alternative environment. Potential alternatives to acute care were identified for these patients. In addition, indication of discharge planning was also recorded for all patients, as this has been shown to reduce both length of stay and unplanned re-admissions to hospital.

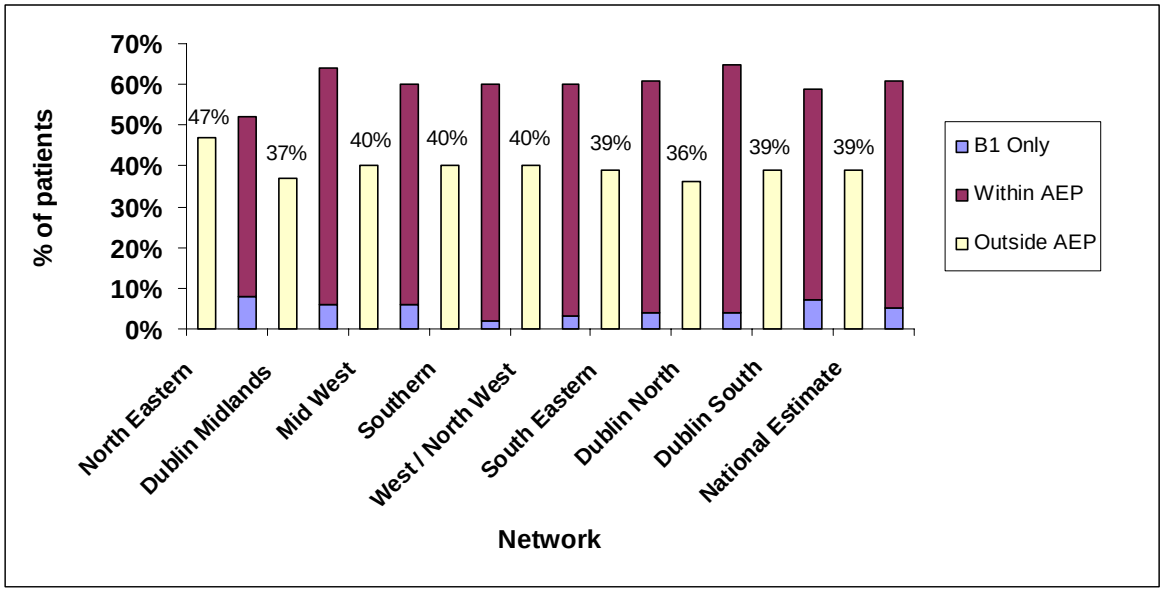
The national picture shows that 39% of patients surveyed were outside the AEP criteria

These patients could therefore have potentially been treated in an alternative setting on the day of care, if appropriate alternatives were available. This varied across networks, ranging from 47% in the North East to 36% in Dublin North. The principal alternatives to acute care identified for these patients were, in order of priority:

- Access to a non-acute bed with therapy support eg physiotherapy
- Home-based patient care including GP support, therapy, specialist nursing, community nursing and home care packages
- Access to assessment/diagnostics without acute admission.

Discharge planning was in evidence from the patient notes for 40% of all patients surveyed.

Figure 2: AEP Results for Day of Care



Implications of survey findings for healthcare delivery in Ireland

The study shows that 13% of hospital admissions and 39% of hospital days were considered to be inappropriate based on the AEP criteria. Whilst these percentages appear high, they are consistent with the results of similar surveys undertaken in Ireland and internationally as various studies have shown that up to 20% of hospital admissions and 20-40% of total patient days are inappropriate using the AEP tool.

It should be emphasised that it might not be obvious to the clinician at the time of admission whether a patient should be admitted. Each hospital requires a certain level of 'inappropriate' admissions. This is to reduce the risk of non-admission of appropriate patients. The size of this buffer is determined by the acceptable level of risk defined by the hospital and the balance between demand and capacity.

The data, whilst collected in an acute setting, indicate a need for transformational change in the way care is delivered to patients across the health system.

Detailed analysis of the data shows that the most important factor influencing appropriate placement of a patient is the system of care delivery rather than the patient themselves. It is not the complex nature of the patient condition, the fact that the patient is old or lives alone, but the way our local health systems are configured to treat and care for that patient that results in inappropriate occupancy of an acute bed.

The findings indicate the need for change across three main areas:

- The prevention and management of chronic illness to reduce demand on the acute setting
- The nature, capacity and availability of responsive community based services, to avoid unnecessary admissions to acute care and to facilitate earlier discharge and a return to independence

- The internal organisational factors within hospitals that can influence length of stay, bed occupancy and bed utilisation.

Improvements in illness prevention and management

The survey data show that almost 70% of patients have comorbidities, most of which are chronic diseases. The resource impact of chronic disease is high – these patients use over 60% of hospital bed days, and complex chronic disease in 5% of patients, uses 40% of bed days.

The growing volume of literature links the prevalent comorbidities, such as heart disease, chronic obstructive pulmonary disease and hypertension to a handful of personal health behaviours. This emphasises the role for prevention in current medical practice in changing the personal health behaviours of patients long before clinical disease develops.

The emergent picture of the patient population – over 65, on multiple medications, likely to have co-morbidity; underlines the importance of strategies to prevent illness and manage chronic disease, which in turn will promote independence and reduce demand for acute care.

Increasing access to alternatives to acute admission and acute care

The survey results highlight the need to focus on strengthening healthcare capacity outside of the acute setting. The diversity of the alternatives identified confirms the demand for the close to home patient care espoused by international best practice. A broad range of community and home-based care options are needed to ensure patients are placed in the most appropriate setting. By far the most significant alternative to admission identified was access to assessment and diagnostics. This was followed by 'non-acute bed and therapy' and 'own home and GP'. A range of options based at home – 'home and therapy'; 'home and specialist nurse'; 'home and community nurse' as well as 'home and care package' featured consistently across the networks.

A definite 'capacity gap' with regard to non-acute beds was identified, particularly in the Dublin North and South. Consideration of this issue in light of international best practice confirms the requirement to think about a varied spectrum of non-acute care, with a strong focus on the ultimate return to independence of most patients, rather than continuing to meet demand by increasing the volume of non-acute beds, which is not a sustainable option.

Improving utilisation of existing bed capacity

The review highlighted the need to improve the internal hospital organisational factors that influence length of stay, bed occupancy and bed utilisation.

In particular, improving the planning and management of discharge and patient review and assessment would maximise the utilisation of existing beds.

The review confirmed difficulties in accessing the non-acute beds and community support required for some patients to be discharged from hospital. This issue was particularly severe in Dublin North and Dublin South.

However, reducing delay and length of stay for the majority of patients, who can be discharged to their own homes without complex support arrangements, would free bed

capacity and improve the flow of patients through acute beds. Discharge planning was in evidence for just 40% of patients, and 17% had an estimated date of discharge.

Analysis of the factors affecting discharge for patients outside of the AEP shows that 43% are linked to ongoing review and assessment by clinical staff and it was confirmed at the networks consultation sessions that there is potential to improve internal processes to reduce such delays.

The need for change has been recognised by the Health Service Executive. Its Transformation Programme sets out an ambitious programme of change to be undertaken by the Irish Health Service. The vision is defined as "everybody will have easy access to high quality care and services that they have confidence in and staff are proud to provide." It is clear the course for change set by the Irish Transformation programme is aligned with the international best practice healthcare delivery. Our consideration of systems working towards best practice in healthcare delivery reveals a striking consensus on the direction of change across reform agendas and service blueprints in countries such as Australia, the UK, New Zealand, Canada and the United States.

Conclusions and Recommendations

Conclusion 1: This review concludes that the most influential factor determining appropriateness of bed utilisation is how the care system in place manages the patient, rather than the characteristics of the individual patient.

Recommendation 1: The recommended changes to service configuration and care delivery in this report to increase appropriate placement of patients should be taken forward as part of the HSE Transformation Programme.

Conclusion 2: The data confirm that additional and different capacity is needed if patients are to be more appropriately placed. In particular, the data support the shift towards a wide spectrum of home and community based care, and away from the acute, inpatient setting. Acute hospital admissions and acute length of stay could be reduced if access to the following alternatives was improved:

- Assessment/diagnostics
- A non-acute bed with therapy support
- Home-based patient care including GP support, therapy, specialist nursing, community nursing and home care packages.

Recommendation 2.1: Increase provision of a broad spectrum of community and home-based care to avoid admissions, facilitate timely discharge and ensure convenient, patient-centred care. These care options include:

- Improved access to specialist nursing, eg to support management of chronic diseases outside of the acute hospital
- Resources to support provision of i/v therapy in the home
- Improved access to home care packages and community nursing to support self-care, anticipatory care and co-ordinate access to services.

Recommendation 2.2: Increase access to diagnostics and assessment without admission to the acute hospital setting. Based on the survey data, this includes:

- Extended hours of access to diagnostics and assessment
- Creation of community based diagnostic capacity
- Roll-out of MAUs to facilitate assessment without admissions where clinically appropriate and protocol based access to diagnostics
- Improved GP access to hospital and community diagnostics to reduce delays and avoid unnecessary admissions.

Recommendation 2.3: Increase the range of non-acute bed-based alternatives available.

- Confirm the scale of the capacity gap for long-term care and other non-acute beds at Hospital Network level
- Identify opportunities to improve access to non-acute beds through better utilisation
- Increase non-acute bed capacity in the context of the role of the non-acute bed as one aspect of the spectrum of non-acute care

Conclusion 3: The survey confirms there is significant opportunity to use the current complement of acute beds more efficiently through changes in hospital practice. The review highlighted the need to improve the internal hospital organisational factors that influence length of stay, bed occupancy and bed utilisation. This includes the configuration of ward rounds, introduction of discharge planning and management and multi-disciplinary working to reduce delay in assessment and discharge.

Recommendation 3.1: Implement protocol-based discharge planning and use of estimated dates of discharge. Based on the findings of this review, this should include:

- Implementing protocol-led discharge
- Early involvement of PCCC in the planning of patient discharge and transition to non-acute care.
- Identifying lead-in times required, eg test, and test result availability, medicines, transport, social services and planning around the lead-in times
- Multi-disciplinary, team-based working to reduce delay during care and at discharge
- Establishing regular decision making ward rounds at least once a day
- Matching time of discharge with time beds are required on an hourly basis.

Recommendation 3.2: Review internal hospital processes to reduce patient delay.

- Revising processes for patient assessment and review to ensure timely access to senior decision-making
- Support the provision of timely access to assessment and diagnostics

Conclusion 4: The review signals a need for the re-orientation of services to ensure more appropriate placement of patients, which demands far greater integration of care delivery across health providers at a local level. Optimising any one aspect of the patient pathway in isolation will not deliver optimum care across the whole system as all of the above

factors interact with each other in a systematic way. These interactions are often complex, but they can be predicted and managed.

Recommendation 4: Adopt an approach of joint-working across providers within and outside of the acute setting to implement the recommendations of this review at local level.

Conclusion 5: There is a need to increase the focus on illness prevention and management

Greater identification and management of high-risk populations and those with chronic disease is necessary to minimise admissions and optimise use of additional home and community based support.

Recommendation 5: Accelerate the implementation of the National Chronic Disease Management Strategy

Conclusion 6: The HSE now has the trained staff, tools and supporting materials necessary to undertake acute bed utilisation review. Such review should become an integral part of HSE business as usual activity.

Recommendation 6: Undertake the survey at hospital level (100% survey sample size) to inform detailed local planning and performance improvement and to assess the impact of changes made as a result of this study.

Table of Contents

1. Introduction

1. Introduction

This section describes the context, objectives and methodology of the 'Acute Hospital In-Patient Bed Utilisation Review Project', hereby referred to as the 'Bed Utilisation Review', undertaken on behalf of the Health Service Executive (HSE) by PA Consulting Group (PA) and the Balance of Care Group (BOC) between November 2006 and April 2007. It also summarises the structure of this report, which details the key findings and recommendations resulting from the review. It should be noted that a number of associated supporting deliverables directly linked to this review (training material, database of records etc.) have also been made available to the HSE, and these are referenced in Appendix M of this report.

1.1 Background and Context of the Bed Utilisation Review

The HSE, in its capacity as the body responsible for the provision of health and personal social services in Ireland in the most beneficial, effective and efficient manner, is committed to ensuring that all patients are treated in the most appropriate health care setting.

In fulfilling this commitment, it is important for the HSE to develop a detailed understanding of the current extent to which patients are receiving care in the most appropriate environment, and for those that may not be, to identify and understand the underlying reasons. Only having achieved this, shall it then be possible for the HSE to put in place the necessary measures to ensure that in future more patients receive the most appropriate care in the correct environment.

1.2 Aim and Objectives of the Bed Utilisation Review

Within the context of the above commitment, the HSE decided to undertake a project with the aim of reporting on the utilisation of acute adult medical and surgical inpatient beds in acute hospitals with an Emergency Department (ED). This required an assessment of the extent to which patients in the adult medical and surgical acute inpatient setting within these hospitals could potentially be treated in a more fitting (alternative to acute admission) environment, and what alternative care settings are required to facilitate this.

In order to quantify this, the following specific objectives had to be addressed:

- To quantify the proportion of patients **admitted** into this acute setting that could potentially have been treated in an alternative environment to acute admission, using as a basis the Appropriateness Evaluation Protocol (AEP), which is subsequently described in this report
- For those that could potentially have avoided acute admission, to identify the underlying reasons for this, and to quantify the type of care that would be best suited to meeting the needs of these patients
- To quantify the proportion of patients **being cared for** in this acute setting on a particular day that could potentially have been treated in an alternative environment, using AEP as the basis
- For those that could potentially have been cared for outside the acute setting, to identify the underlying reasons for this, and to quantify the type of care that would be best suited to meet the needs of these patients

- Using this information, and the results of a literature review on inpatient utilisation, and a review of international best-practice (both undertaken as part of this bed utilisation review), to make a series of recommendations as to future steps the HSE should consider to ensure that patients are treated in the most appropriate environment

- To provide the HSE with the tools to enable individual acute hospitals to conduct their own bed utilisation reviews in the future.

1.3 Introduction to the Bed Utilisation Review

In order to meet the objectives as outlined above, it was clear that the basis for such a review would be the undertaking of a survey of a significant proportion of the adult medical/surgical patient population in those hospitals with an ED, using as a basis for appraisal the AEP tool as subsequently outlined for both admission (Day of Admission) and care (Day of Care). This tool and the approach that was adopted for its application and subsequent interpretation are described in the following sections of this report.

1.4 Interpretation of Results

Within a bed utilisation review there are essentially two separate components: the appropriateness of the intervention, or the lack of it, and the appropriateness of the care setting within which that intervention is undertaken. This relates the care processes to the structures and should avoid the trap that the two are necessarily the same. This may be very important in the subsequent creation and redesign of new and innovative models of care. For example, an acute hospital site may have care processes delivered that are not necessarily acute care and, depending on the context, may or may not be appropriately undertaken on that site.

It should also be emphasised that the term 'appropriateness' is defined in terms of the potential for alternative types and locations of care, rather than any absolute measure of clinical need, and there is no 'desirable' benchmark. One definition of the appropriateness of admission is given by Coast et al (1996):

> Appropriate:
>
> Those patients for whom there is no alternative to admission to the acute hospital with its high technology facilities. This would be the case even if lower-technology alternatives to hospital admission existed.
>
> Inappropriate:
>
> Those patients for whom there may potentially be a lower-technology alternative admission to the acute hospital. This does not mean that the patient has no requirement for care in the acute hospital at the present time.

As described in the review of literature (see Appendix N) there are bound to be substantial variations in 'appropriateness' in different hospitals and networks. This can be the result of a myriad of elements, ranging from the casemix and specialty mix of a hospital, through current referral, admission and discharge practice, to the availability of community based alternatives. The benefits of a bed utilisation study are concentrated in the insights that can be offered into the potential changes in care processes, and how these link to the overall configuration of services. However this can only provide an indication of the scale of changes possible.

1.5 Structure of the Report

This report is structured as follows:

1.5.1 Chapter 2 – Role of the AEP in Bed Utilisation Review

Chapter 2 contains a brief literature review of the AEP. Specifically it details:

- What the AEP is
- Why the AEP was chosen and is appropriate for this bed utilisation review
- How it has been validated
- Examples of the results obtained from other AEP surveys; and
- How it can be used as an input for process and performance improvement.

1.5.2 Chapter 3 – Methodology

Chapter 3 sets out the methodology of the bed utilisation review, and details the various steps that were undertaken as part of its execution. Specifically it contains details of:

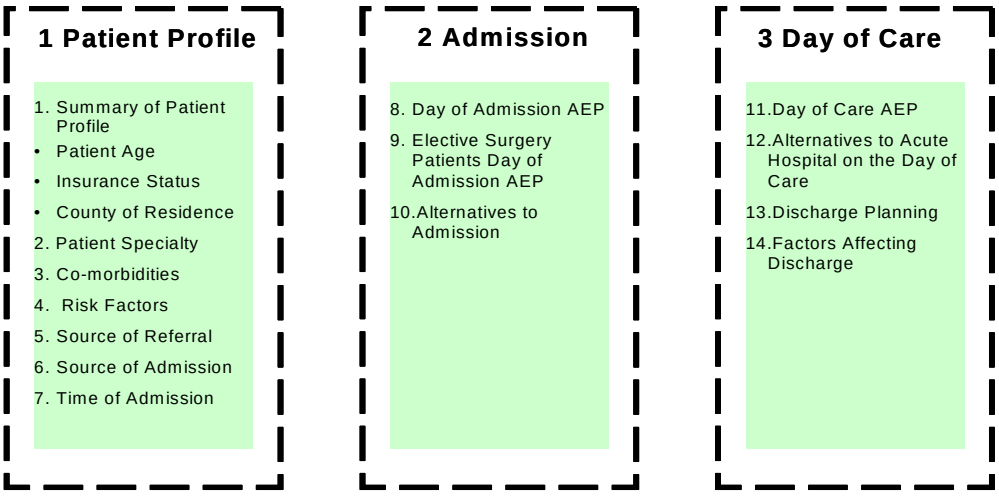
- How the hospital sampling framework and process was undertaken
- The hospitals included in the bed utilisation review
- The subsequent analysis of the data gathered; and
- The feedback of the results to the hospitals/networks.

1.5.3 Chapter 4 - National Picture

This chapter presents the results of the bed utilisation review at a national level. The results contained in this section have been generated from aggregating the results of all the surveyed hospitals together, and they best reflect the scale and nature of the issues at hand across the country as a whole.

With regards to means by which the results are presented, they are structured around three main groupings as reflected in figure 1.1 below.

Figure 1.1: Presentation of results.



1.5.4 Chapter 5 – Assessment of Implications

Chapter 5 addresses the implications of the national results in the context of best practice.

1.5.5 Chapter 6 – Conclusions and Recommendations

Following on from the assessment of implications, a set of conclusions are drawn with the focus again being on the national picture. Finally a set of recommendations are made with regards to steps that the HSE should consider taking, to fulfil the aim of the bed utilisation review. These recommendations are based upon the results of this bed utilisation review, relevant experience of PA and BOC, and a review of international best practice.

1.6 Acknowledgements

It is important to acknowledge the contribution and effort made by the following individuals and organisations in facilitating what proved to be a challenging task that was further compounded by the need for it to be undertaken in a short period of time:

1. The Surveyors – The involvement of clinically trained staff in the survey was fundamental to the success of the review. In total 129 surveyors were trained in the application of the AEP tool and subsequently involved in the survey of the 3035 patient notes.

2. The Nursing and Midwifery Planning & Development Units (NMPDUs) – The NMPDUs played a vital role in recruiting and mobilising staff to undertaken the surveys.

3. The Network and Hospital Managers – It would have been impossible to undertake the survey without the permission and cooperation of the Network and Hospital Managers/CEOs in granting access to the survey teams.

4. The Hospital Staff – In all instances the Hospital Staff present on the wards during the survey were very cooperative, and greatly facilitated the job of the surveyors.

5. The Directors of Nursing – The vast majority of surveyors were nurses, and as such it is important to acknowledge the contribution of the Directors of Nursing in making this resource available.

6. The Departments of Public Health and Specialists in Public Health Medicine in each region – Again, it would have been impossible to undertake the surveys without their help, as this was invaluable in coordinating preparation, providing support to the surveyors during the survey, and subsequently generating any subsequent data that were required by the project team.

7. The Health Service Executive – The project team assigned to manage the bed utilisation review contributed greatly to the timely completion of the review by coordinating all aspects of the hospital survey process. They also provided invaluable guidance in undertaking the feedback and elaborating the final report. The School of Public Health and Population Science, University College Dublin, provided valuable statistical advice to the HSE.

2. Role of the AEP Tool in Bed Utilisation Review

2. Role of the AEP Tool in Bed Utilisation Review

2.1 The AEP Tool

'Utilisation review' is the term used for assessing the appropriateness of hospitalisation for patients. A number of tools have been developed to consider appropriateness. The AEP is one such instrument which provides criteria for evaluation of current care practice in the acute setting. It enables an analysis of the reasons for *admission* as well as those for *continuing stay* in an acute care setting against a range of criteria for judging the appropriateness of that setting for individual patients in terms of the acuity of their condition or treatment requirements. The types of criteria can be summarised as:

On admission

- Severity of illness :eg unconscious, unable to move, acute bleeding
- Intensity of service: eg surgery + general anaesthesia, regular monitoring, i/v therapy

On day of care

- Medical services
- Nursing services
- Patient condition: eg acute confusion, other acute states, coma, fever

A full list of the AEP criteria is at Appendix P.

The elective surgery variant of the AEP facilitates analysis of the appropriateness of location of surgery and timeliness of admission for elective surgery patients. A full list of the elective surgery variant AEP criteria is at Appendix Q.

For the acute hospital survey sites, the AEP formed the core of the survey form around which other questions sought information about potential alternative care settings - whether they were currently available or not. This was a crucial assumption as the survey was being used to identify *potential demand* for alternative services – irrespective of whether or not they currently exist. Definitions of the alternatives specified on the survey form are provided in Appendix U, with a copy of the survey form at Appendix O.

It should be emphasised that the data was collected solely from patient charts, and to the extent that certain information sought may not be reliably recorded (eg incapacity of carer) then the data recorded may be incomplete.

2.2 Use of AEP Tool for this Review

The two most widely used assessment tools are the Appropriateness Evaluation Protocol (AEP) and the Intensity-Severity-Discharge: Adult tool (ISD-A; also known as 'Interqual'). Both tools originated in the USA, but the AEP was subsequently the focus of a major exercise which established and tested European versions and, of these two assessment tools, has had wider application in EU countries (including Ireland and the UK). These tools (and others, such as the Oxford Bed Study Instrument [OBSI] and the Managed Care Appropriateness Protocol [MCAP]) are described in more detail in Appendix N.

Results from a wide range of studies would appear to suggest that all instruments are capable of providing similar results for a given population; and more pragmatic

considerations of applying an instrument are likely to play a part in which is chosen. The ISD instrument is commercially supported and provides a detailed assessment but there is a licence cost in its implementation and it can be quite time-consuming to complete.

The OBSI is a much simpler and speedier instrument to apply, but the inputs required from care staff responsible for looking after patients can lead to a loss of objectivity.

The AEP does not have a licensing cost. The tool therefore does not have technical support but relies on local capabilities to run a successful and meaningful study. It has an inherently more objective focus than the OBSI (relying exclusively on patient notes). It can also be rapidly applied; for many patients the criteria are relatively straightforward to identify and decide upon. Therefore the AEP was deemed an appropriate tool for this review.

2.3 Validation of the AEP Tool

Originally developed in the USA, the AEP tool has been adapted for use in the UK and Europe. The validity and reliability of the AEP tool have been tested in a range of studies in countries across Europe and in the US with satisfactory results. A full review of the literature is given at Appendix N, which also provides various references that have assessed its validity in a European setting, eg Lang et al (1999).

2.4 Examples of Results from other AEP Surveys

Similar surveys undertaken in Ireland and internationally have shown that up to 20% of hospital admissions and 20% to 40% of total patient days are inappropriate, as detailed in the literature review.

In previous Irish utilisation reviews, the percentage of inappropriate admissions ranges from 8-23%. The most common alternatives to acute admission identified were:

- A lower, sub-acute level of care (eg in a community hospital setting)
- An observational/assessment unit
- Rapid access to outpatient clinics (eg chest pain clinics).

The range of inappropriate 'day of care' findings in those studies which included them was 23 - 65%. Reasons for inappropriate days of hospital stay fell under three main headings:

- Need for step-down bed or long-term care facility
- Delays identified within hospital treatment/ diagnosis/ consultation processes
- Delays in transfer to a tertiary centre

2.5 Use of AEP Data in Process and Performance improvement

Strategic and operational solutions required to address bed utilisation need a range of information that describes the current situation in terms of casemix, intensity and immediacy of care, the timeliness of delivery, the suitability of location and access to the processes of care and any delays or constraints to the delivery of necessary care.

Interpreting and comparing results of different utilisation review studies needs to be done with care. Important factors leading to different validity and interpretation of findings include: the population being studied; the extent to which existing or putative alternatives to acute care are considered; the basis for the numbers included in the survey; and the range of specialties and patient ages included. Appendix N reports some of the summary

results reported by different studies in recent years. This includes several Irish studies undertaken since 1990.

Within a bed utilisation review there are essentially two separate components: the appropriateness of the clinical intervention (or lack of it); and the appropriateness of the care setting within which that intervention is undertaken. This relates the care processes to the structures and should avoid the trap that the two are necessarily the same. This may be very important in the subsequent creation and redesign of new and innovative models of care. For example, an acute hospital may be delivering care processes that are not necessarily 'acute care' which, depending on the context, may or may not be appropriate on that site.

There is a role for local clinical review in the application of assessment tools, and how best to do this is extensively discussed in the literature. This need not be at the point of using the assessment tool itself, but in the development and setting of overall acceptable standards of admission and continuing care. Levels of 'inappropriate' admissions or continuing care can never be entirely eliminated from a health system – nor is it necessarily desirable that they should be. It is in deciding and setting the parameters of what is justified in terms of risk management of patients that clinicians play an important role.

The focus of most bed utilisation studies is on potential alternatives to acute hospital admission and continued stay, and the findings can be used to support the development of new service models. For example past exercises have

- Designed community services for proactive care of chronic diseases and frailty
- Reduced bed numbers through identification of nursing and therapy staffing needs
- Redesigned discharge planning processes
- Established the requirements for community hospital and community staffing provision.

The main value of AEP lies in highlighting the range of process issues that need to be addressed in the clinical managerial process and alternative care settings that need to be developed. Reports of bed utilisation reviews have demonstrated reductions in admissions and lengths of stay and the potential for clear, evidence-based practical alternatives to manage inappropriate admissions (such as urgent outpatient and domiciliary assessments, palliative care or rehabilitation) in alternative settings.

3. Structure and Methodology of the Bed Utilisation Review

3. Structure and Methodology of the Bed Utilisation Review

In undertaking the bed utilisation review, the project methodology adopted resulted in five distinct phases, each of which is described in turn below:

3.1 Preparation

In undertaking a review of this size, it was important that adequate preparation was undertaken, in order to ensure that not only were the surveys undertaken in a smooth and seamless fashion, with minimum disruption caused to the hospitals, but they were also comprehensive and consistent to facilitate subsequent data analysis at a hospital, network and national level. In order to achieve this, the following steps were undertaken:

3.1.1 Definition of Sampling Framework and Process

The first issue to agree was the nature, size and means by which the patients to be sampled for the bed utilisation review were to be selected.

It was agreed by the HSE and PA/BOC, that all acute medical and surgical patients at each hospital with an ED should be considered for sampling. The only exceptions to this were to be obstetrics, paediatrics, psychiatry, and day case patients, as the AEP tool is designed specifically to assess medical and surgical inpatients. Specialised, non-acute services (eg patients in designated long stay care of the elderly beds) were excluded from the review.

It was also agreed that the survey should be undertaken as a point prevalence exercise, executed on an NHO network campaign basis.

With regards to the size of the survey sample that was to be drawn from each qualifying hospital, the HSE, upon guidance from the School of Public Health and Population Science at University College Dublin, requested that the following guidelines be adhered to when selecting the number of patients to be included in the sample. This was determined on the basis of:

- The precision of 95% confidence intervals for proportions
- Results from previous relevant studies
- The number of hospitals in the study
- The estimated number of patients per day in these hospitals; and
- The available resources.

Table 3.1: Guidelines for selecting survey sample size

Number of Qualifying Patients per Hospital	Number of Patients in Sample
Fewer than 100	50
100 – 299	75
300 and Over	125

Whilst this approach has the effect of proportionally sampling more patients in smaller hospitals, it was the opinion of the HSE that this was more than offset by the benefits of providing the smaller hospitals with a larger sample upon which they could subsequently use the results as a basis for their own analysis.

As a result of this sampling approach, 3035 patients were sampled out of a qualifying patient population of 8322 patients. This sample represents 36% of the patient population.

Finally, with regards to the means by which the sample was to be selected, a randomised approach, as described in Appendix K, was adopted for both the initial selection of patients, and the subsequent replacement of those who had been discharged with alternates.

3.1.2 Consolidation of the Survey Form

Having agreed on the number and mechanism by which patients would be selected for the bed utilisation review, the next step was to finalise the survey form that would be used as the basis for the patients to be assessed.

Whilst the AEP criteria and the elective surgery variant themselves have been agreed and validated internationally (see Appendix P and Q), it was important that the survey form itself was clearly and unambiguously laid out, and that sufficient attention was given to capturing all supporting information (eg demographic details, alternative care settings [see Appendix U], GMS status etc.) on the form, as this would be the basis around which the surveys would be conducted.

Appendix O contains the survey form that was used as the basis for the bed utilisation review. It should be noted that this form and the survey process subsequently described were piloted in the North Eastern hospital network in order to test the validity of the procedure. The North East hospitals were selected for the pilot as it was their request to be sampled first. Subsequent to the pilot, there were some minor changes made with regards to both the terminology used in identifying alternative care settings, and the way in which the elective surgery element was presented.

3.1.3 Identification and Training of Surveyors

In order to ensure that the AEP form was both correctly and consistently applied to all the patients selected to participate in the bed utilisation review, it was important that clinically qualified staff experienced in working in the acute sector were used as the basis for assessment is the interpretation of the patient's medical records. Furthermore, in order to respect patient confidentiality issues, it was necessary that only HSE staff were granted access to these records. This also facilitated another objective of the HSE in carrying out the bed utilisation review, that of training and enabling their own staff to subsequently undertake such reviews independently.

Each hospital network was thus asked to provide a list of volunteer nursing staff that would be willing to participate in the survey, and this group was further augmented with HSE nursing and medical staff that were already supporting the review.

In total 129 names were put forward to participate as surveyors in the bed utilisation review for the various networks. This group was subsequently given dedicated survey training that detailed the aims and objectives of the assignment, the potential benefits to which the results generated from it could be put, the means by which they were to undertake the survey, and how the survey form was to be filled out. Key points that were stressed as part of this training were:

- Several of the questions to be addressed when assessing the patient notes, including those related to the interpretation of whether a patient met AEP criteria, rely on the surveyors ability to abstract the relevant material from the patients notes and, where necessary, make clinical judgements on the basis of this

- When assessing the potential for patients to be more suitably treated in alternative care settings, it is important to consider all alternatives rather than restricting the assessment to alternatives that are currently in place. It should be noted that guidance material was also supplied with additional information and definitions regarding alternatives (see Appendix U for a summary of these).

A full list of the surveyors used in this bed utilisation review is included in Appendix R of this report. It should also be noted that the training material that was used has also been delivered to the HSE in the context of this assignment (see Appendix M) and as such is available for any future training of staff.

3.2 Hospital Survey

In this second phase, teams of surveyors trained in the application of the AEP tool, were allocated to each of the hospitals participating in the review. The surveys were conducted on a hospital network basis. To avoid seasonal variations in admission and discharge, no surveys were conducted during the Christmas period (18th December – 8th January).

Surveyors were not allocated to the hospital that they worked in, as this ensured that their appraisals were neither biased, nor constrained by perceptions of current care alternatives. This approach afforded surveyors the opportunity to be exposed to the clinical practices and procedures in a different setting, and potentially learn from or compare certain differences with their own hospital's practices (eg the way in which patient notes were structured, or how discharge procedures were coordinated).

The Terms of Reference (TOR) for this assignment specified that all 38 hospitals with an ED in Ireland should be surveyed as part of this bed utilisation review. However, during the preparation stage of the review, the following amendments were made to this initial list, resulting in the final number of hospitals surveyed as being 37:

1. Galway University Hospital (Merlin Park) was added to the review as, whilst it does not have a dedicated ED, it provides acute bed capacity for patients admitted from Galway Regional Hospital (UCHG), which does have an ED, and was part of the original hospital list

2. Cashel General Hospital and Clonmel General Hospital were omitted from the review as, at the time when they were to be surveyed, they were undergoing an amalgamation of services

With regards to the selection of the samples for each of the hospitals, the process as previously detailed was adhered to with the following exceptions:

1. Wexford General Hospital – which as a result of an administrative error, had a sample size of 50 chosen, instead of a sample size of 75, which would have been consistent with its applicable patient population of 159

2. Monaghan General Hospital – where the full patient population of 65 was surveyed, rather than the sample size of 50

The precise number of patients surveyed in each hospital was in some instances slightly higher or lower that the proposed sample size as extra patients were surveyed or some survey forms were incomplete. In all instances the number of patients surveyed represents the total number of completed survey forms received at the end of the survey.

The following table lists, using as a basis the hospital network structure upon which the survey campaign was based, the full names of the hospitals surveyed, the abbreviations subsequently used in this report to refer to them, and the date that the survey took place.

Table 3.2: Summary of hospitals surveyed

Network	Hospital Name	Abbreviation	Survey Date
1 – North Eastern			
	Cavan General Hospital	Cavan	06/12/2006
	Our Lady of Lourdes, Drogheda	Drogheda	06/12/2006
	Louth County Hospital, Dundalk	Louth	06/12/2006
	Monaghan General Hospital	Monaghan	06/12/2006
	Our Lady's Hospital, Navan	Navan	06/12/2006
2 – Dublin Midlands			
	Midlands Regional Hospital, Tullamore	Tullamore	14/12/2006
	Midlands Regional Hospital, Mullingar	Mullingar	14/12/2006
	Midlands Regional Hospital, Portlaoise	Portlaoise	14/12/2006
	Naas General Hospital	Naas	14/12/2006
	Adelade, Meath including National Childrens Hospital Tallaght	AMNCH	19/01/2007
3 – Mid West			
	Mid Western Regional Hospital, Dooradoyle	Dooradoyle	10/01/2007
	St John's Hospital, Limerick	St John's	10/01/2007
	Mid Western Regional Hospital, Ennis	Ennis	10/01/2007
	Mid Western Regional Hospital, Nenagh	Nenagh	10/01/2007
4 – Southern			
	Mercy University Hospital	Mercy	11/01/2007
	South Infirmary Victoria University Hospital	SIVU	11/01/2007
	Mallow General Hospital	Mallow	11/01/2007

	Cork University Hospital	Cork	11/01/2007
	Kerry General Hospital	Kerry	11/01/2007
	Bantry General Hospital	Bantry	11/01/2007
5 – West/North West			
	Letterkenny General Hospital	Letterkenny	16/01/2007
	Sligo General Hospital	Sligo	16/01/2007
	Roscommon County Hospital	Roscommon	17/01/2007
	Portiuncula Hospital	Portiuncula	17/01/2007
	Galway University Hospital – UCHG	UCHG	17/01/2007
	Mayo General Hospital	Mayo	17/01/2007
	Galway University Hospital - Merlin Park	Merlin	17/01/2007
6 – South Eastern			
	Waterford Regional Hospital	Waterford	18/01/2007
	St. Luke's Hospital, Kilkenny	St. Luke's	18/01/2007
	Wexford General Hospital	Wexford	18/01/2007
7 – Dublin North			
	Mater Misericordiae University Hospital	MMUH	25/01/2007
	Connolly Memorial Hospital	Connolly	12/01/2007
	Beaumont Hospital	Beaumont	25/01/2007
8 – Dublin South			
	St. Columcille's Hospital	St. Columcille's	23/01/2007
	St. Vincent's University Hospital	St. Vincent's	24/01/2007
	St. Michael's Hospital, Dun Laoghaire	St. Michael's	24/01/2007
	St James's Hospital	St. James's	23/01/2007

Finally, it should be noted that support was provided to the surveyors during the surveys themselves by members of the HSE team coordinating the review, who were present at each hospital on the day of the surveys, and also a consultant physician from Balance of Care, who was available for consultation by all surveyors, on the application of the AEP via telephone or on-site.

3.3 Data Analysis

Upon receipt of the survey forms for each network, the data were entered into an 'Access' database and subsequently analysed using a combination of 'Excel' and 'SPSS' to address a variety of factors linked to the aim and objectives of the bed utilisation review.

In the first instance this analysis was conducted at a hospital network level, and the results generated were based upon the **survey sample** figures (**3035** patients). It was these results that were in turn used as the basis for conducting the network feedback/consultation sessions.

Upon completion of the survey and feedback/consultation process for all eight networks, the results were however recalculated in accordance with Inverse Sample Fraction process as documented in Appendix L to be more representative of the **survey population** figure (**8322** patients) and subsequently amalgamated to derive the national picture. It is these results that are presented in this report. It should however also be noted that the headline AEP figures listed for both Day of Admission and Day of Care for each hospital in Appendix I of this report are unaffected by this process.

3.4 Feedback/Consultation

A key phase of the review was the undertaking of a series of dedicated feedback/consultation sessions with each of the eight hospital networks. In each instance, a group of clinical and managerial staff from the network were brought together to discuss their network results and the underlying issues that influence them.

This process not only enabled the confirmation of the results with clinical teams in each of the hospitals, but also afforded the opportunity for an exchange of views and opinions as to what the underlying reasons were for these in each network.

This feedback/consultation has been invaluable in informing this report, and it is incorporated throughout it.

The dates and locations for the feedback/consultation sessions undertaken are listed in Appendix T.

3.5 Reporting

Using as a basis the results of the data analysis and the feedback provided from each of the networks, the final phase was the generation of this report, which amalgamates and presents the findings generated from the analysis of the data gathered, the insight and feedback provided by each of the networks, the results of an AEP literature review, and an assessment of international best practice.

4. National Survey Results

4. National Survey Results

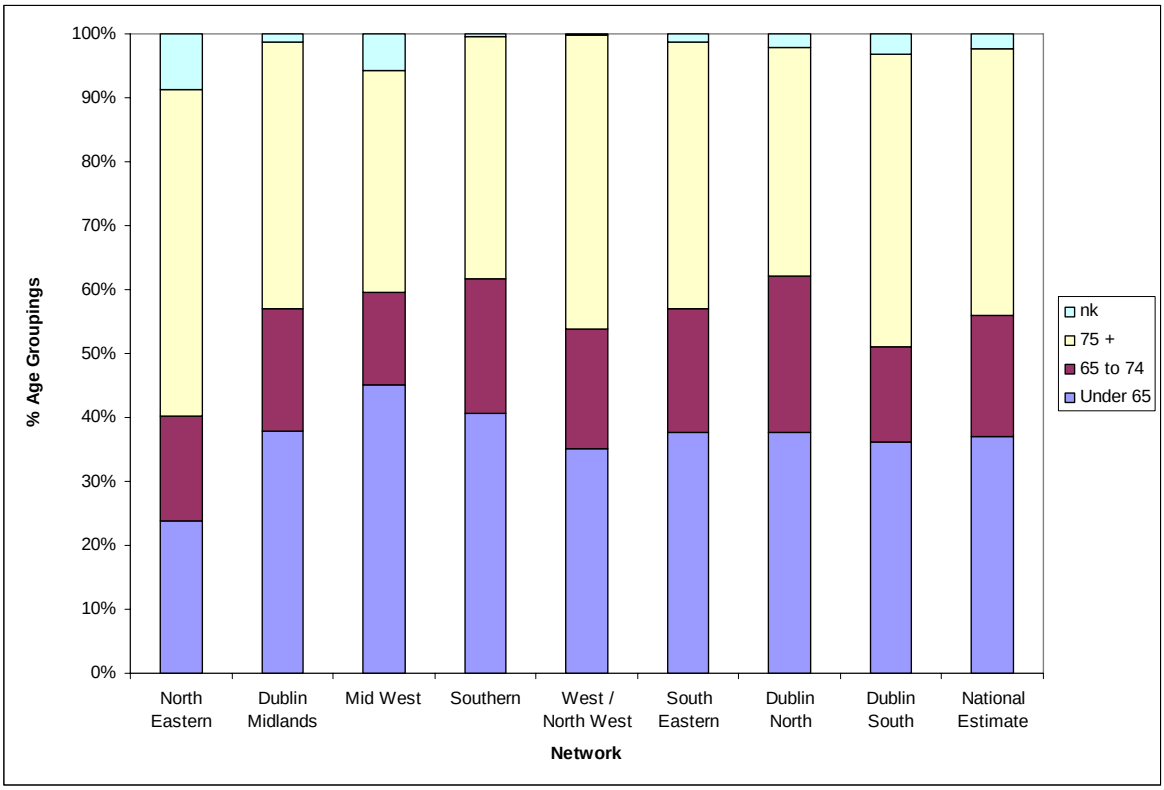
The following section details the findings of the bed utilisation review at the national level. These have been generated from aggregating the results of each of the 37 individual hospitals surveyed within each of the eight hospital networks as listed in Table 3.2, incorporating the inverse of sample fraction.

4.1 Patient Profile

The patient profile data gathered during the survey provide us with a rich profile of admitted patients in Irish acute hospitals. Understanding the age profile, patient specialty, prevalence of comorbidities, time of patient arrival and source of referral is essential to informing a view of the strategies that would improve bed utilisation.

4.1.1 Patient Age

Figure 4.1 Patient age profile by network and national estimate

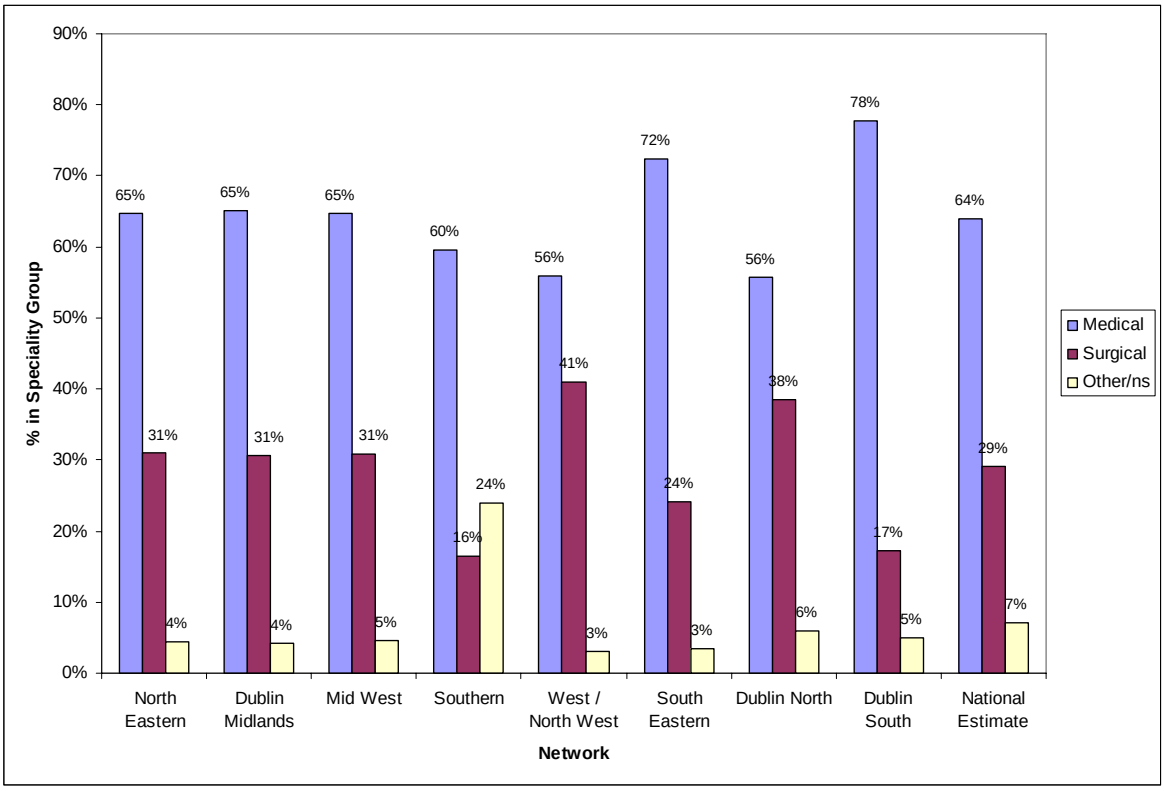


nk = not known

Across the national survey population, 63% of the patients were 65 years of age or over, which is significantly older than the Irish national population profile in general. The proportion of patients aged under 65 years ranged from 45% in the Mid West to 24% in the North East, where the patient age profile was considerably older than the national average. As these data were drawn from the patient notes there are some data missing and patient age was not available for 2% of patients. The data show that 62% of patients had a GMS card.

4.1.2 Patient Speciality

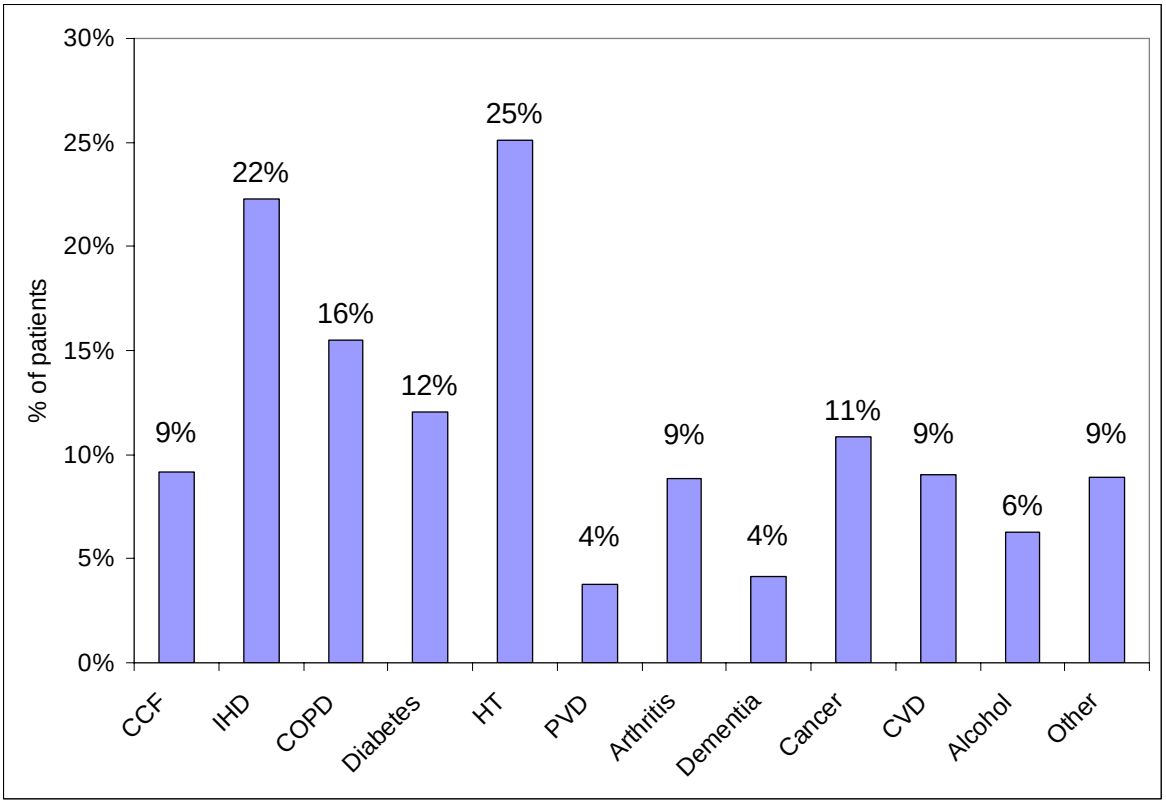
Figure 4.2 Bed designation of patients on admission



The majority of patients (64%) in all networks were medical. These data show that the proportion of medical patients ranged from 78% in Dublin South to 56% in Dublin North and West/North West. West/North West also had the highest proportion of surgical patients - 41%.

4.1.3 Patient Comorbidity (Type)

Figure 4.3 Types and percentages of comorbidities presented by patients



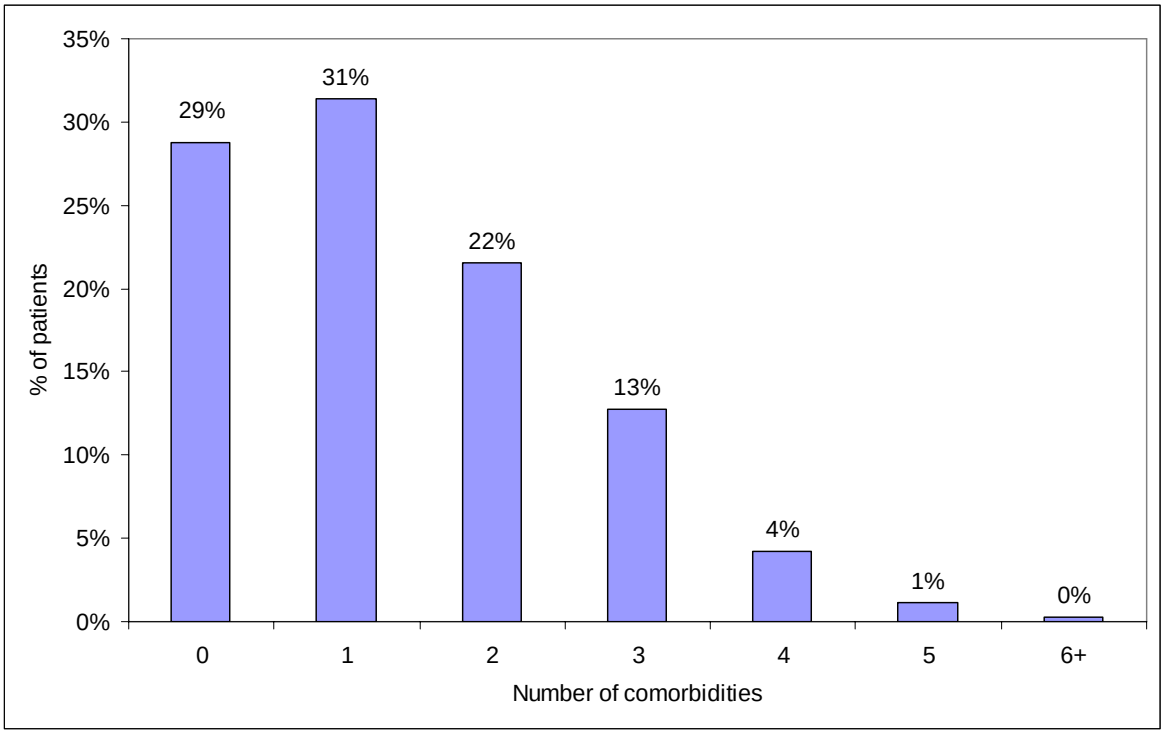
CCF	Congestive Cardiac Failure
IHD	Ischaemic Heart Disease
COPD	Chronic Obstructive Pulmonary Disease
HT	Hypertension
PVD	Peripheral vascular disease
CVD	Cardiovascular disease

Hypertension (HT) was the most common comorbidity identified, recorded for 25% of the survey population. The analysis shows that 22% of patients had Ischaemic Heart Disease (IHD) and 16% of patients had Chronic Obstructive Pulmonary Disease (COPD).

Hypertension, IHD and COPD were the most common comorbidities recorded in every network.

4.1.4 Patient Comorbidity (Prevalence)

Figure 4.4 Percentage of patients presenting with comorbidities

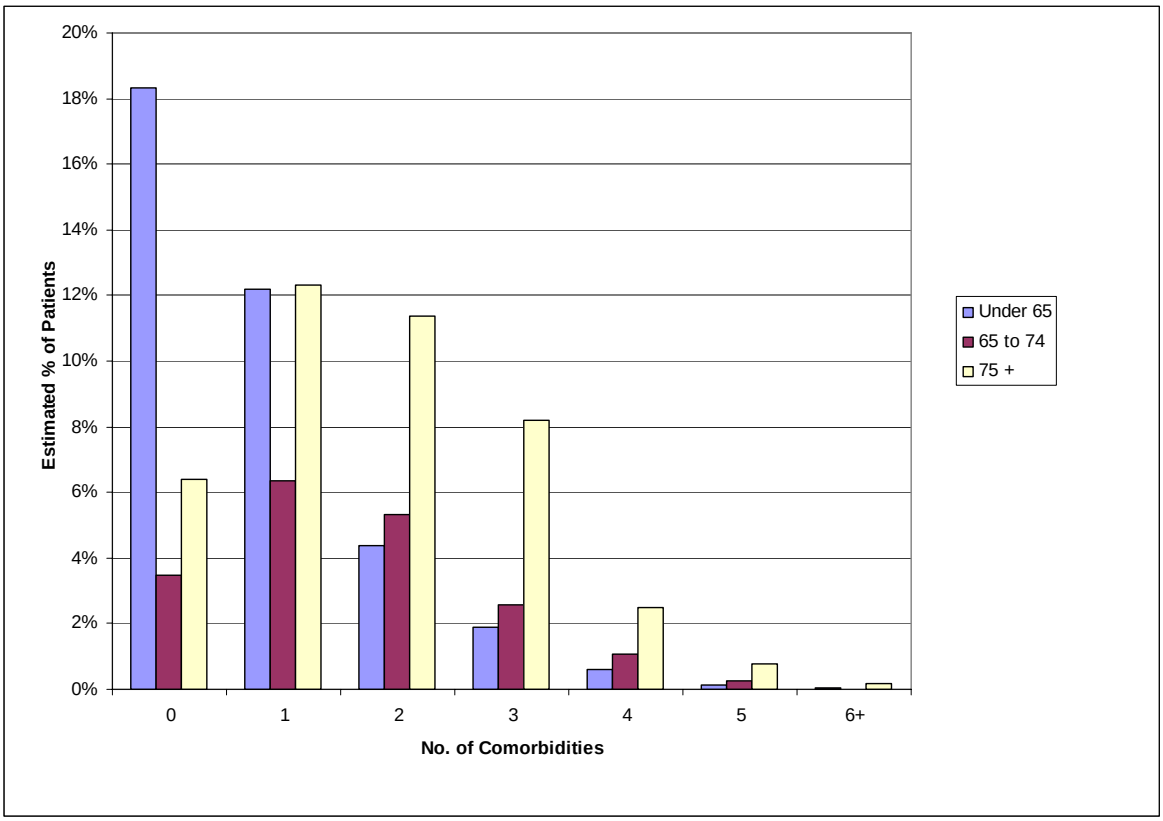


This graph shows that 71% of patients in the national survey population presented with at least one co-morbidity. Prevalence of comorbidity was similar across networks, with the exception of the high of 79% South Eastern and the low of 65% in the Mid West.

Within the survey population, 40% had at least two comorbidities and 18% of patients had three or more.

Impact of Age on Number of Comorbidities

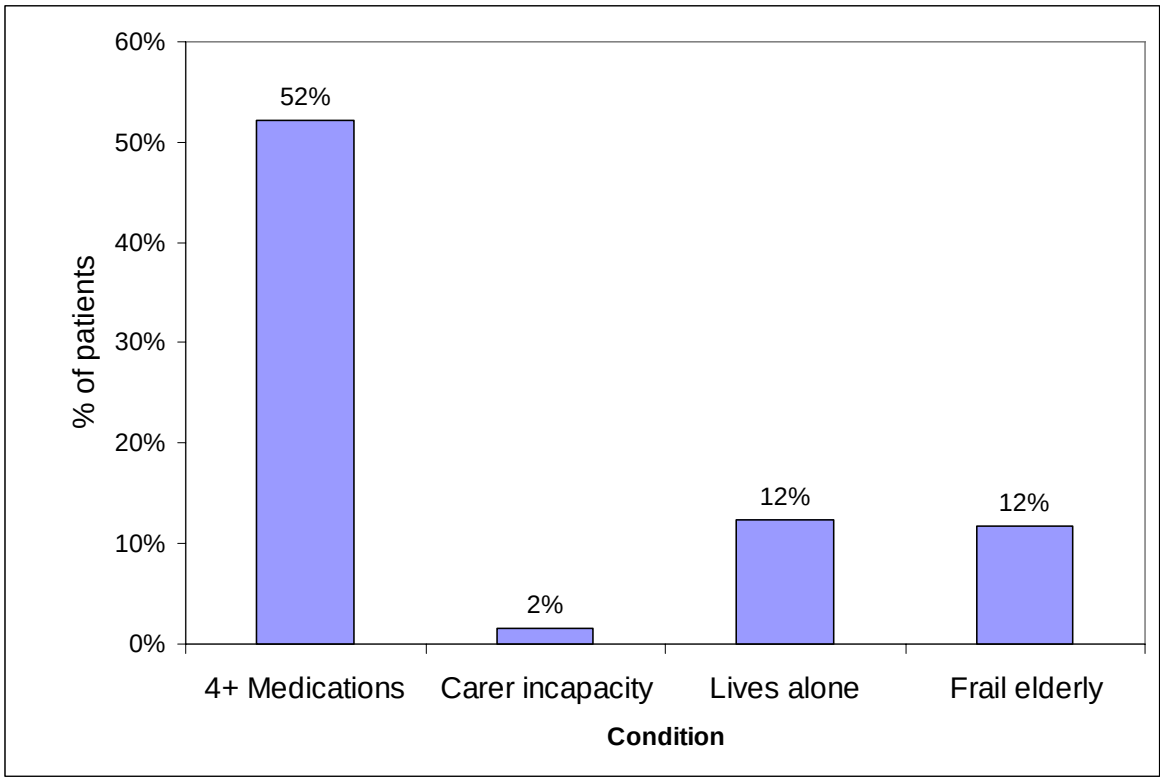
Figure 4.5 Impact of age on comorbidities



This analysis confirms that older patients were more likely to present with multiple comorbidities. Those under 65 were least likely to present with a co-morbidity, however approximately half of these patients presented with at least one.

4.1.5 Other Patient Conditions

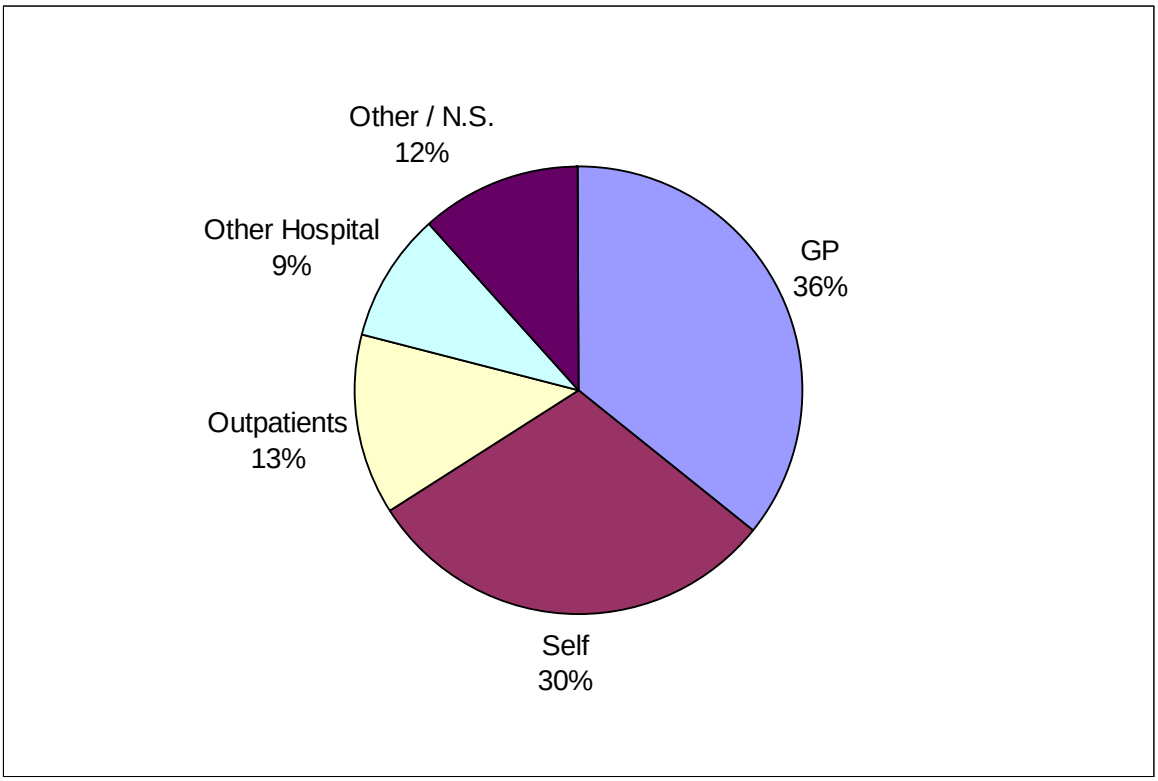
Figure 4.6 Percentage of patients presenting with other conditions



A high proportion of patients (52%) were on multiple medication therapies at the point of admission. These data reflect the factors documented in the patient charts, which may explain the low incidence rates of factors such as carer incapacity or living alone that often do not manifest themselves until later in the admission when patient discharge is being discussed.

4.1.6 Source of Referral

Figure 4.7 Source of patient referral



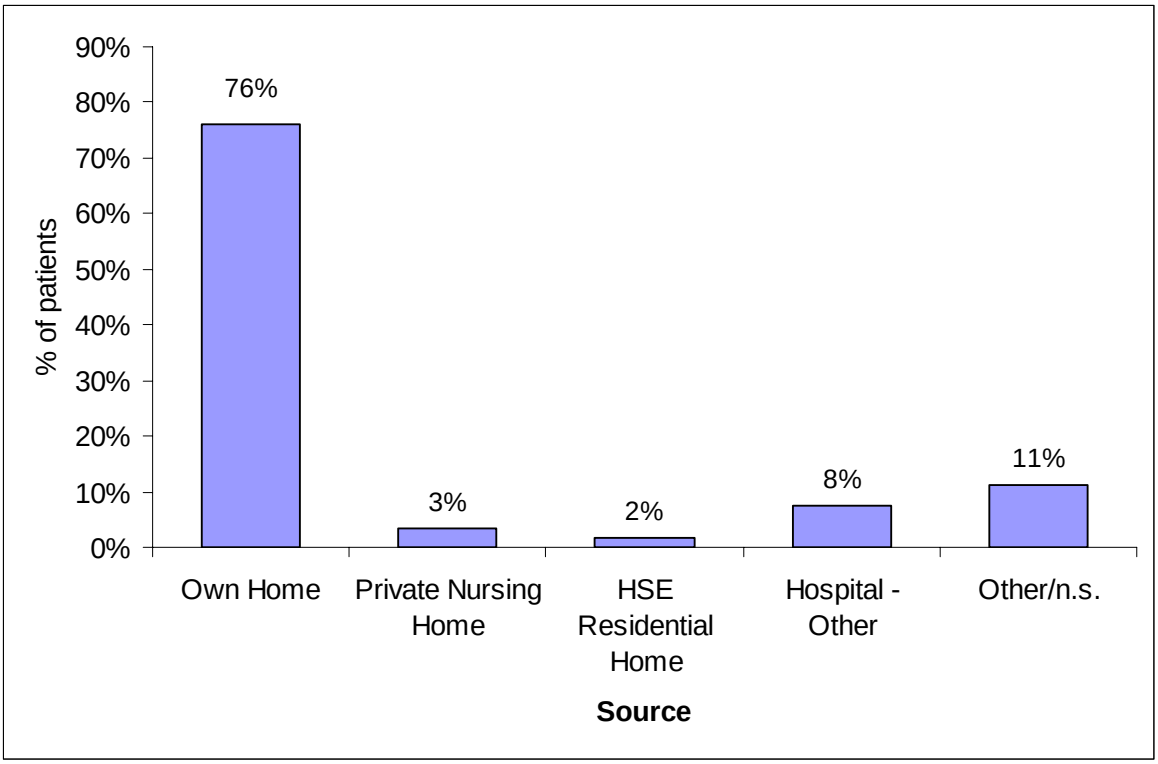
Over one third of admitted patients (36%) were referred to the acute hospital by a GP. Patient self-referral was the second most common source of referral, at 30%.

This varied considerably by network. GP referral was highest in West North West (50%) and the North East (45%). It was considerably lower in Dublin North (23%) and Dublin South (27%).

The source of referral was not known/not recorded on the patient notes for 12% of patients.

4.1.7 Source of Admission

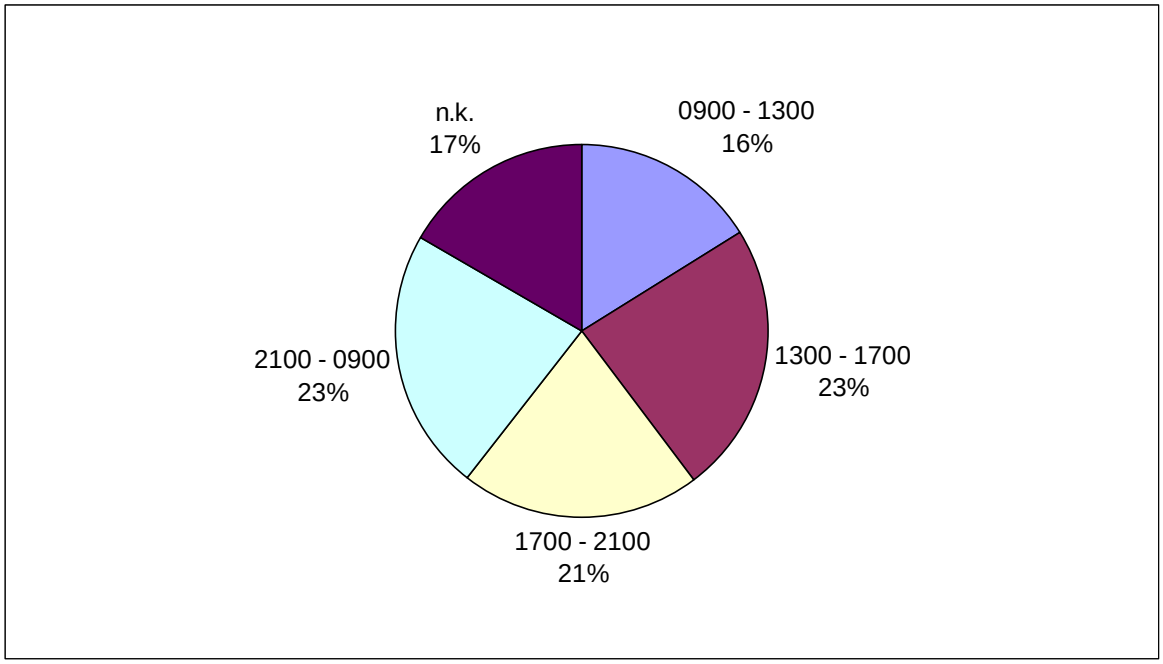
Figure 4.8 Source of patient admission



Within the survey population, 76% were admitted from their own homes. The data indicate a low level of intra-hospital transfers in most networks. The national average is 8% admitted from other hospitals; however this rose to 12% in Dublin South. Admissions from HSE Residential Homes accounted for 2% of admissions, and 3% of patients were admitted from Nursing Homes. The source of admission was not specified for 11% of patients.

4.1.8 Time of Arrival

Figure 4.9 Time of patient arrival



Approaching half (44%) of all patient arrivals occurred in the afternoon and evening, and 23% of admissions presented at night (between 9PM and 9AM).

Patient arrival information was not available for 17% of admissions.

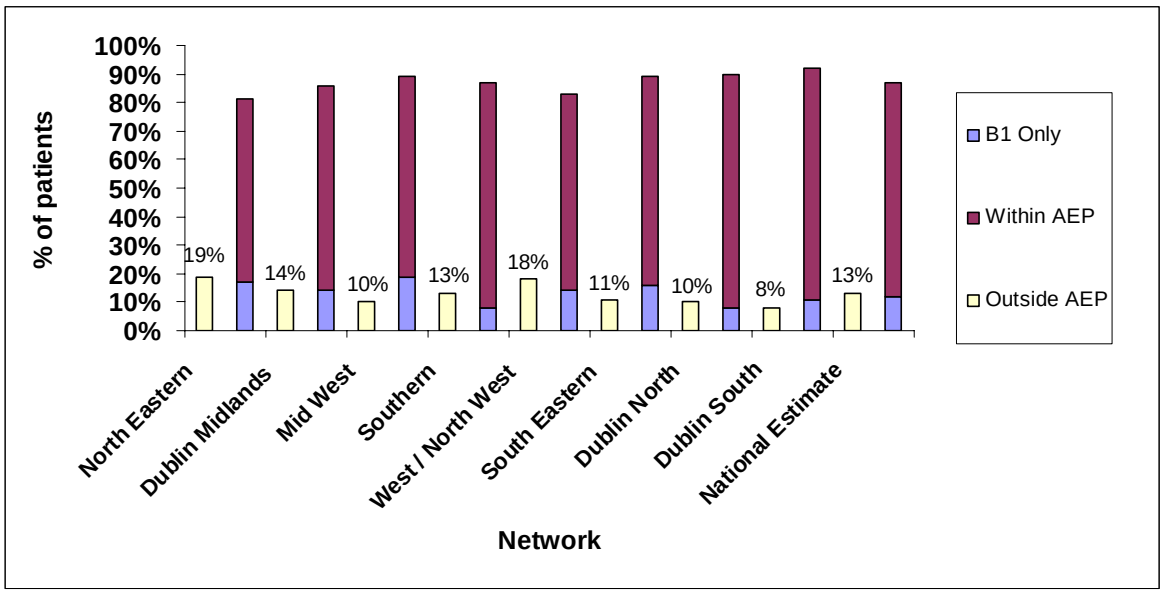
4.2 Day of Admission

The percentage of patients admitted outside of the AEP criteria shows the proportion of patients that could potentially have avoided acute hospital admission. These patients could possibly have been treated elsewhere if alternatives were available. The elective surgery variant of the AEP was used to find out some additional information regarding elective surgery patients – whether they were admitted too far in advance of their surgery (and thus had a longer length of stay than necessary) and whether their surgery required acute inpatient admission or could have been undertaken as a day procedure.

Surveyors also identified alternatives to acute admission for patients admitted outside of the AEP criteria. These data are necessary to inform the strategies to improve bed utilisation and increase appropriate placement of patients.

4.2.1 AEP Results for Day of Admission

Figure 4.10 Categorisation of patients with regards to the AEP on day of admission



Within the survey population, **13%** of patients had been admitted outside the AEP criteria, and could potentially have been treated outside an acute setting. This proportion is represented by the yellow bar. The graph illustrates the variation across networks. The highest rates were 19% and 18% in the North East and West/North West. Dublin South, Dublin North, South East and Mid West were clustered around 10%.

The other bar (combined blue and purple) represents the patients that were admitted within the AEP Criteria (87%). The blue section of these bars shows the proportion (12%) of patients that were appropriately admitted but only met one AEP criterion (B1) ie the provision of intravenous medications and/or fluid replacement (does not include tube feedings).

Statistical Analysis of the Influence of patient Characteristics on AEP Results for Day of Admission

In order to attempt to better understand why patients are admitted outside AEP, it was decided to undertake a statistical analysis of the various characteristics that could potentially have an influence on this. This analysis was undertaken in two parts, namely:

- A univariate analysis that tests the influence of single characteristics (eg patient age) on admission outside AEP
- A multivariate analysis that combines the individual characteristics found to have an influence in the univariate analysis to examine the extent to which these can be used to predict patients admitted outside AEP.

It should be noted that in both instances all unknowns were excluded from the analysis.

The results of this analysis is presented in the following sub-sections, and shows that whilst the univariate analysis has identified some strong relationships between patient characteristic and AEP grouping on admission, the multivariate analysis that builds upon these does not display the same collective strength of relationship and as a result the model is not robust in predicting patients outside AEP on admission.

In itself this is a valuable finding, as it indicates that, at a national level of analysis at least, it is not the characteristics of the patients themselves that are the cause of admission outside AEP, but rather something else. This conclusion is inline with our experience from previous studies, which indicate that the predominant forces in determining both admissions and days of care outside AEP are service configurations and clinical processes.

It is thus recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are admitted or treated outside AEP are sought.

i. Univariate analysis of characteristics influencing admission outside AEP

The following table summarises the results of this univariate analysis. It shows that the most likely characteristics (probability greater than 99%) to lead to an admission outside AEP are:

- Casemix value of the hospital the patients attends (patients attending casemix group 2 hospitals are more likely to be admitted outside AEP)
- The time at which they arrive at the hospital (patients arriving between 13:00 and 17:00 are more likely to be admitted outside AEP)
- Their county of residence (patients from rural counties such as Mayo and Roscommon are more likely to be admitted outside AEP)
- Their source of referral (patients referred from outpatient are more likely to be admitted outside AEP)
- Where they are admitted from (patients admitted from other hospitals are more likely to be admitted outside AEP).

It should be noted that a full listing of percentages for all univariate significant characteristic for both Admission outside AEP and Day of Care outside AEP is included in Appendix J.

Table 4.1 Results of univariate analysis of strength of relation between patient characteristics and lying outside AEP on admission

Characteristic	χ^2	df	p	Attribute	% Outside AEP	% Inside AEP
Hospital Casemix Value	36.468	2	0.000	1	40	50
				2	45	37
				None	15	30
Time of Arrival	32.812	3	0.000	09:00 – 13:00	19	19
				13:00 – 17:00	35	27
				17:00 – 21:00	26	25
				21:00 – 09:00	20	28
County of Residence	176.429	27	0.000	Dublin	21	29
				Mayo	6	3
Source of Referral	68.328	4	0.000	GP	41	43
				Other Hospital	6	4
				Outpatients	23	16
				Self	30	37
Source of Admission	28.863	3	0.000	Own Home	91	93
				Other Hospital	3	1
				Private Nursing Home	4	4
				HSE Residential Home	2	2

ii. Multivariate analysis of characteristics influencing admission outside AEP

The following table summarises the results of this analysis, detailing only the attributes of the characteristics that are found to have a high probability (greater than 99%) and significant influence on the outcome from a multivariate perspective. It shows that the characteristics most likely to lead to an admission outside AEP are:

- Network (patients in the North East are six times more likely, and those in the West North West are four times more likely to be admitted outside AEP, than those in Dublin South)
- Time of arrival (patients arriving between 13:00 and 15:00 are 1.6 times more likely to be admitted outside AEP than patients arriving between 21:00 and 09:00)
- Treatment speciality (surgical patients are half as likely to be admitted outside AEP than medical patients)
- County of residence (patients from Clare and Cork are more likely to be admitted outside AEP than patients from Dublin)
- Source of referral (patients referred from private clinics are six times more likely to be admitted outside AEP than patients self referring)

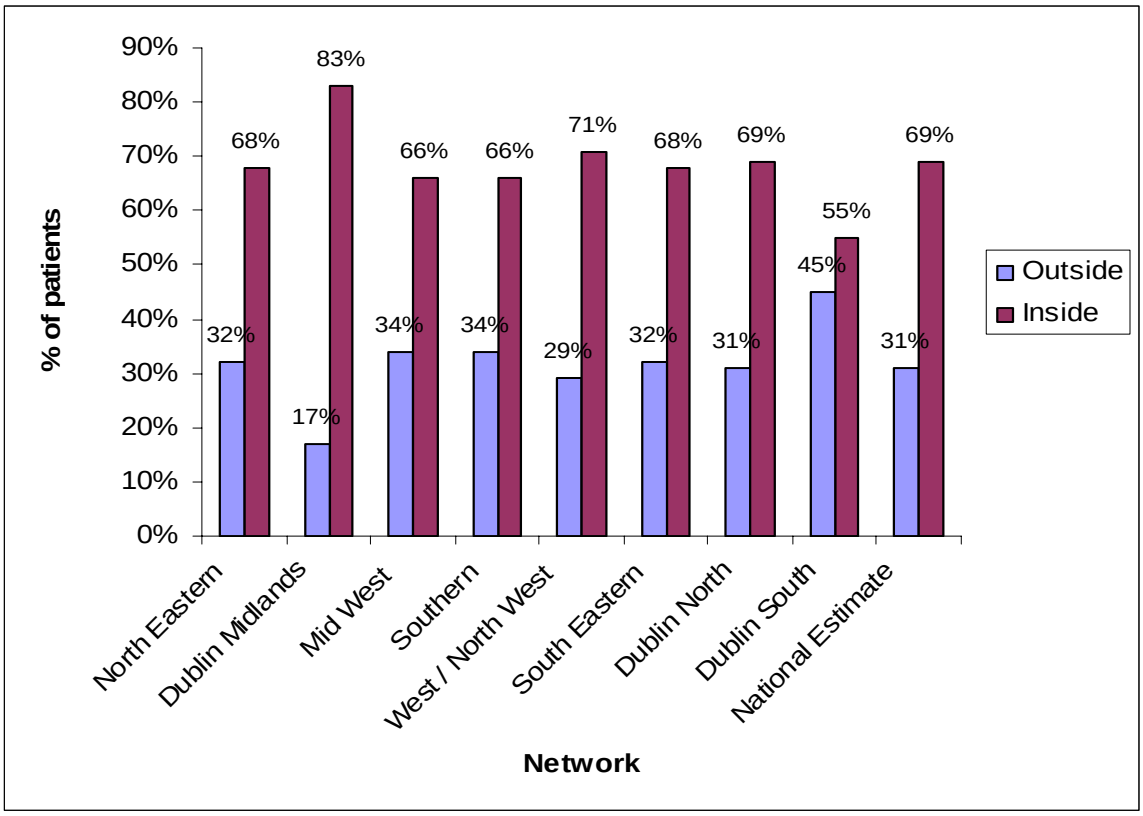
As previously mentioned, it should be noted that the model has been found to predict only 0.4% of the admissions to be inappropriate, whilst however predicting 99.7% of appropriate admissions correctly. This indicates that the model cannot distinguish between appropriate and inappropriate admissions, and is due to the fact that there is collectively little association at a national level between patient characteristics and the appropriateness of admission.

Table 4.2 Results of multivariate analysis of strength of relation between patient attributes and lying outside AEP on admission

Attribute	B	S.E.	Odds Ratio (Exp B)
North Eastern	1.805	0.503	6.079
West/North West	1.431	0.460	4.183
Dublin South		.	.
Time1300_1700	0.492	0.155	1.635
Time2100_0900		.	.
Treatment_Surgical	-0.558	0.145	0.573
Treatment_Medical		.	.
Clare	1.313	0.487	3.717
Cork	1.597	0.534	4.937
Dublin		.	.
Referral_PrivateClinic	1.807	0.512	6.093
Referral_Self		.	.

4.2.2 Elective Surgery Findings

Figure 4.11 Categorisation of elective surgery patients



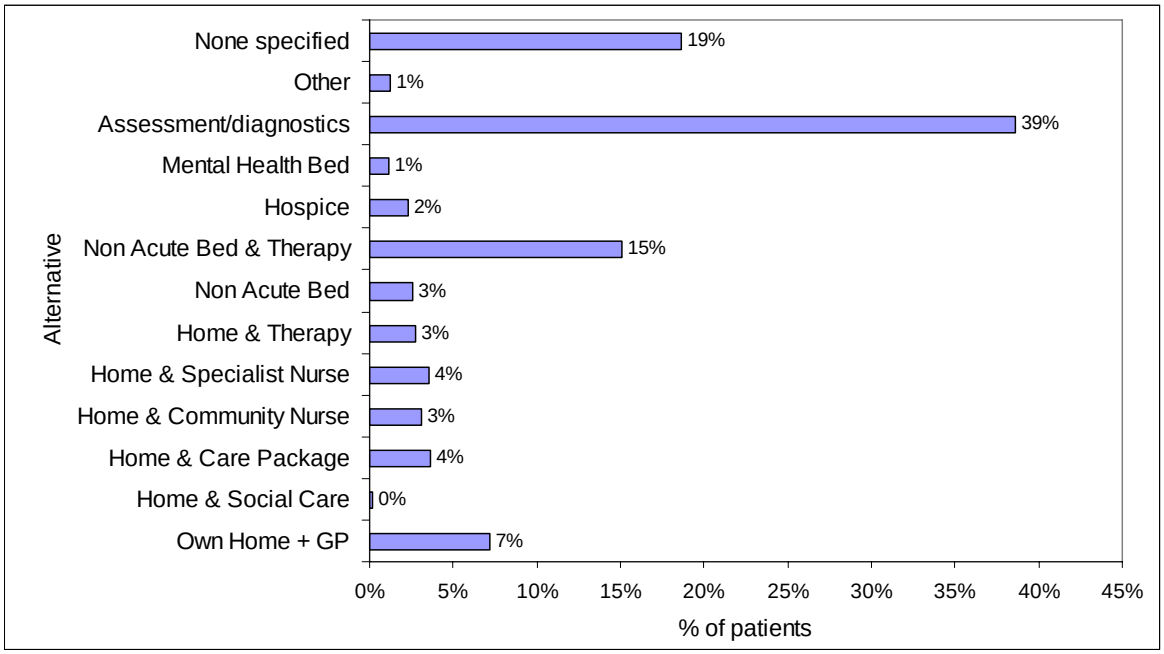
31% of the elective surgery patients were either (a) admitted to the acute hospital earlier than necessary (timeliness criteria) or (b) could have had their surgery on an ambulatory basis if an alternative were available (location criteria).

The national average for patients that did not meet the timeliness criteria was 75%, and the national average for patients that did not meet the location criteria was 37%.

The proportion of patients outside the elective surgery AEP ranged between 17% of patients in Dublin Midlands and 45% in Dublin South.

4.2.3 Alternatives Identified to Admission

Figure 4.12 Alternatives identified to admission for patients outside the AEP on day of admission

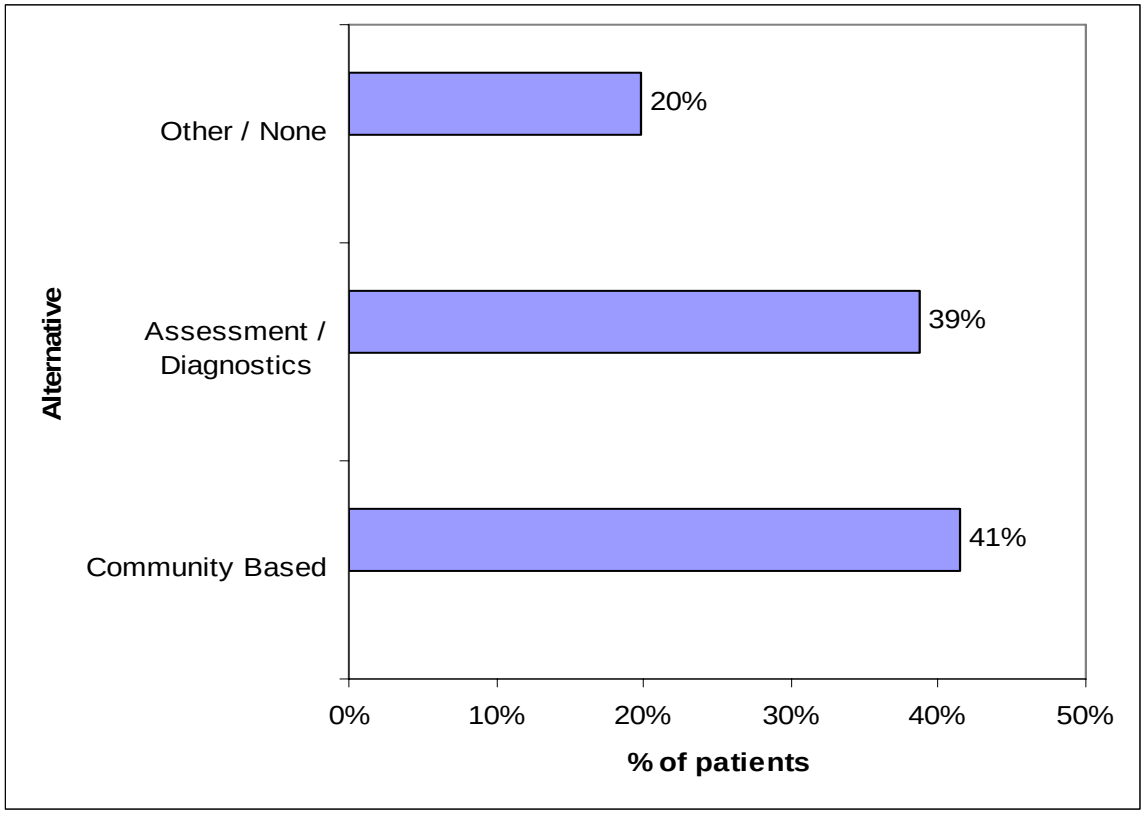


The possible alternatives to admission for the 13% of patients admitted outside the AEP are shown above.

Access to hospital based (but not bed based) Assessment and Diagnostics is the most common alternative, identified for 39% of patients outside AEP. This was followed by Non-acute bed with Therapy at 15% and Own Home and GP at 7%. There was no specified alternative for 19% of the patients outside AEP on admission.

Alternatives Identified to Admission Grouped according to Assessment, or Community Based

Figure 4.13 Alternatives identified to admission for patients outside AEP on day of admission grouped according to assessment or community based needs



Grouping the alternatives identified to admission highlights community based options as the most frequently identified alternatives, at 41%. These results were consistent across networks.

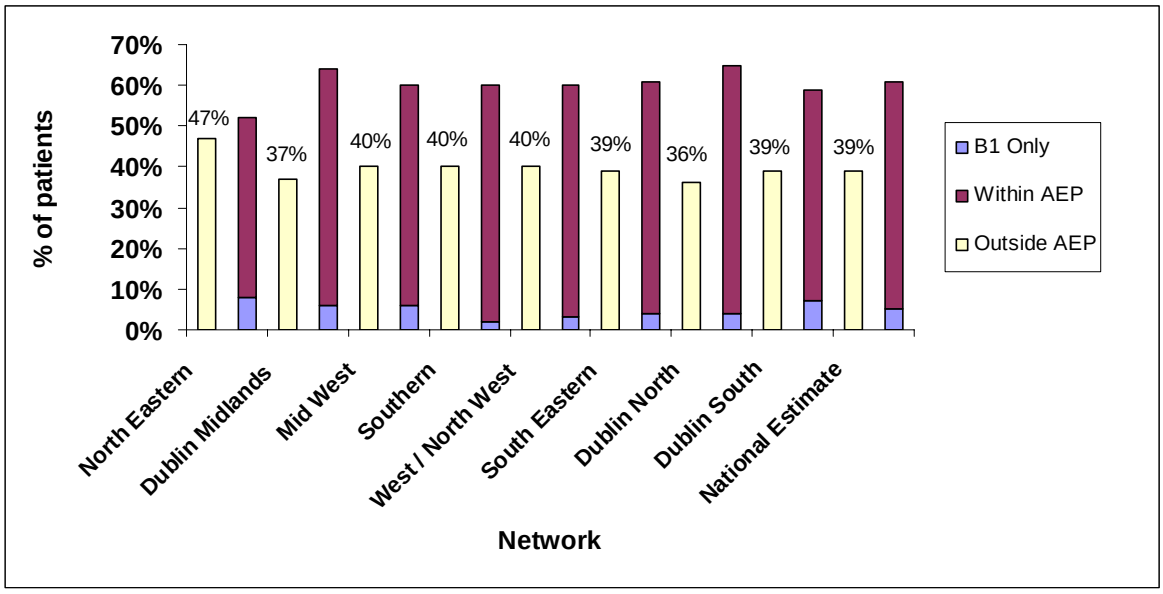
4.3 Day of Care

The percentage of patients outside of the AEP criteria on the survey day of care shows the proportion of patients being cared for in the acute setting on a particular day that could potentially have been treated in an alternative environment.

Surveyors identified alternatives to acute care that were identified for patients admitted outside of the AEP criteria. These data are necessary to inform the strategies to improve bed utilisation and increase appropriate placement of patients.

4.3.1 AEP Results - Day of Care

Figure 4.14 Categorisation of patients with regards to the AEP on day of care



Of the patients surveyed, **39%** could have been treated in an alternative setting on the day of care, if appropriate alternatives were available. This proportion is represented by the yellow bar. This varied across networks, ranging from 47% in the North East to 36% in Dublin North.

The second bar (combined blue and purple) represents the patients that were within the AEP Criteria on their day of care. The blue section of these bars shows the proportion (5%) of patients that were appropriate on their day of care but only met one AEP criterion (D2) ie the provision of intravenous medications and/or fluid replacement (does not include tube feedings).

13% of all patients outside the AEP were receiving physio/ occupational therapy (OT).

Statistical Analysis of the Influence of patient Characteristics on AEP Results for Day of Care

In order to attempt to identify individual characteristics that have an influence in determining whether the patient is more likely to be treated on the day of care outside AEP, a univariate and multivariate analysis were again undertaken to identify and quantify the characteristics most likely to have an influence on this. Again, all unknowns were excluded from this analysis.

The results of this analysis is presented in the following sub-sections, and again shows that, whilst the univariate analysis has identified some strong relationships between patient characteristic and AEP grouping on day of care, the multivariate analysis that builds upon these does not display the same collective strength of relationship, and as a result the model is not robust in predicting patients outside AEP on admission.

Again this indicates that, at a national level of analysis, it is not the characteristics of the patients themselves that are the cause of day of care outside AEP.

i. Univariate analysis of characteristics influencing day of care outside AEP

The following table summarises the results of this univariate analysis. It shows that the most likely characteristics (probability greater than 99%) to lead to day of care outside AEP are:

- Casemix value of the hospital the patients attends (patients attending casemix group 2 hospitals are more likely to be outside AEP on day of care)
- Patient age (patients over the age of 75 are more likely to be outside AEP on day of care)
- The presence of other conditions such as multiple medications
- Treatment speciality (medical patients are more likely to be outside AEP on day of care)
- County of residence (patients from Dublin are more likely to be outside AEP on day of care)
- Elective Surgery (patients not having undergone elective surgery are more likely to be outside AEP on day of care)
- Source of referral (patients self referring are more likely to be outside AEP on day of care).

Again, it should be noted that a full listing of percentages for all significant characteristics is included in Appendix J.

Table 4.3 Results of univariate analysis of strength of relation between patient characteristics and lying outside AEP on day of care

Characteristic	χ^2	Df	p	Attribute	% Outside AEP	% Inside AEP
Hospital Casemix Value	19.024	2	0.000	1	45	50
				2	40	37
				None	15	13
Patient Age	98.612	2	0.000	Under 65	33	38
				65 – 74	18	20
				75 +	49	41
Presence of other conditions	66.286	4	0.000	0	35	43
				1	47	45
				2	16	10
				3	2	2
Treatment Speciality	21.808	2	0.000	Medical	53	47
				Other	20	22
				Surgical	27	29
County of Residence	99.593	27	0.000	Dublin	31	27
				Tipperary	2	3
				Waterford	2	3
Patient being admitted for Elective Surgery	37.515	1	0.000	No	87	84
				Yes	13	16
Source of Referral	83.257	3	0.000	GP	42	44
				Other Hospital	5	4
				Outpatients	12	19
				Self	41	33

ii. Multivariate analysis of characteristics influencing day of care outside AEP

The following table summarises the results of this analysis, detailing the attributes of the characteristics that are found to have a significant influence on the outcome from a multivariate perspective. It shows that the most likely attributes to lead to treatment outside AEP on day of care are:

- Network (patients in the Mid West Network are three times more likely to be treated outside AEP on the day of care than those from Dublin South)
- Patient age (patients 75 years of age or older are 1.3 times more likely to be treated outside AEP on the day of care than those under 65 years of age)
- Source of referral (self referring patients are almost twice as likely to be treated outside AEP on the day of care than those referred from outpatients)
- County of residence (patients from Cavan and Monaghan are much more likely to be treated outside AEP on the day of care than patients from Donegal or Waterford)

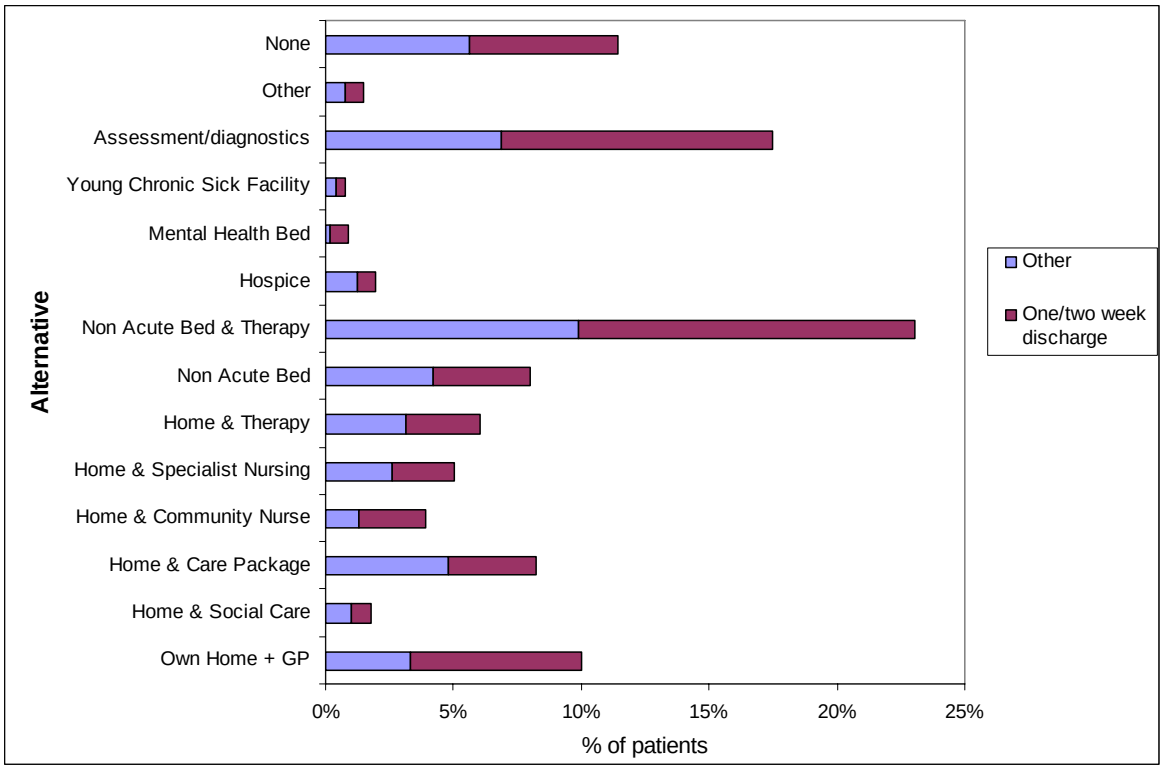
Again it should be noted that, whilst the model has been found to be more successful in predicting patients outside AEP on day of care (successful for 20.2% of cases) and patients inside AEP on day of care (successful for 86% of cases), its overall success rate is 59.2%, and as such these patients characteristics can still not be reliably used to predict patients likely to be treated outside AEP on the day of care.

Table 4.4 Results of multivariate analysis of strength of relation between patient attributes and lying outside AEP on day of care

Attribute	B	S.E.	Odds Ratio (Exp B)
Mid West	1.070	0.387	2.915
Dublin South	.	.	.
Age_Over74	0.267	0.093	1.306
Age_Under65	.	.	.
Referral_Outpatients	-0.640	0.141	0.527
Referral_Self	.	.	.
Cavan	0.865	0.315	2.374
Donegal	-1.039	0.364	0.354
Monaghan	1.093	0.406	2.982
Waterford	-1.728	0.584	0.178
Dublin		.	.

4.3.2 Alternatives Identified for Day of Care

Figure 4.15 Alternatives identified for patients outside the AEP on day of care



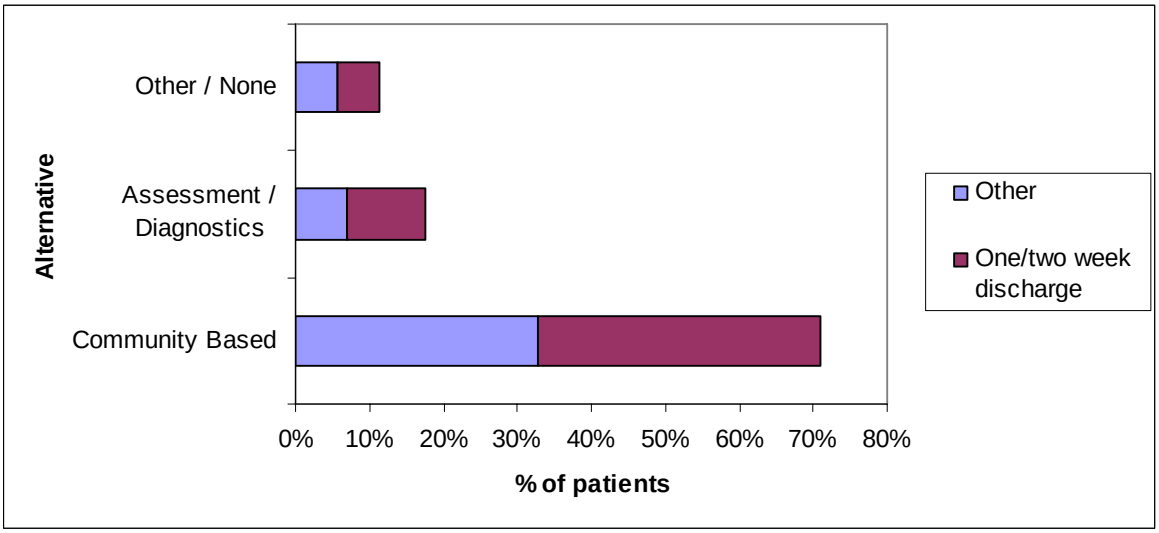
Note: 'One/two week discharge' refers to patients either discharged within one week of the survey, or two weeks if a non-acute bed based alternative was identified

'Non-acute Bed with Therapy Support' (23 %), 'Access to Assessment/Diagnostics' (18%) and 'Own Home and GP' (10%) were the most common alternatives identified for patients outside AEP on their day of care.

These results were consistent across networks.

Alternatives Identified to Acute Care Grouped according to Assessment, Bed or Home

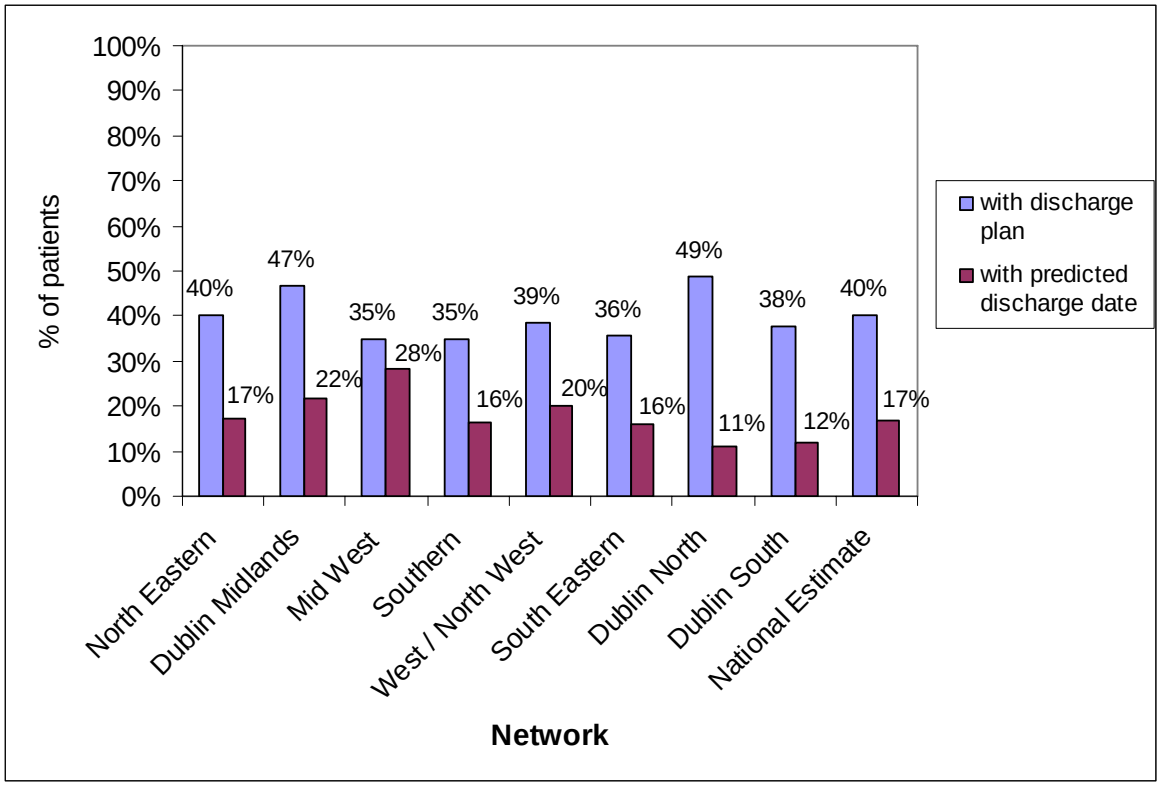
Figure 4.16 Alternatives identified to acute care for patients outside AEP on day of care grouped according to assessment or community based needs



Grouping the alternatives identified to acute care as depicted in Figure 4.15 highlights community based options as the most frequently identified alternatives, at 71%. Within this 71% there was an almost equal split between bed based and home based options and this was consistent across networks.

4.3.3 Discharge Planning

Figure 4.17 Percentage of patients with evidence of discharge planning



Discharge planning was in evidence for 40% of patients in the survey population.

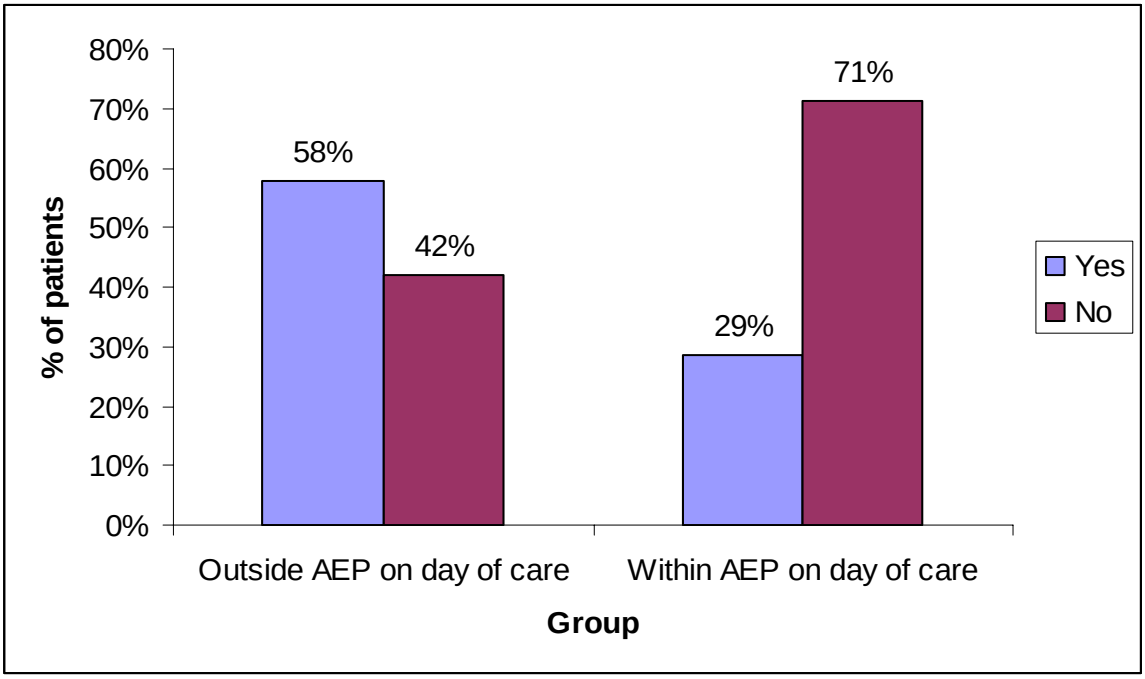
Surveyors identified whether or not there was any form of discharge plan in each patient's notes taking a liberal definition of 'discharge plan' that was not confined to a specific format. Any evidence that discussions or consideration of discharge arrangements had taken place was deemed to count.

The occurrence of discharge planning varied between a high of almost half of patients in Dublin North (49%) to a number of networks clustered around 35%.

Nationally, only a small minority of patients (17%) had predicted dates for discharge. This ranged between 11% in Dublin North, through to 28% in the Mid West.

Variation in discharge planning between patients outside and inside AEP on day of care

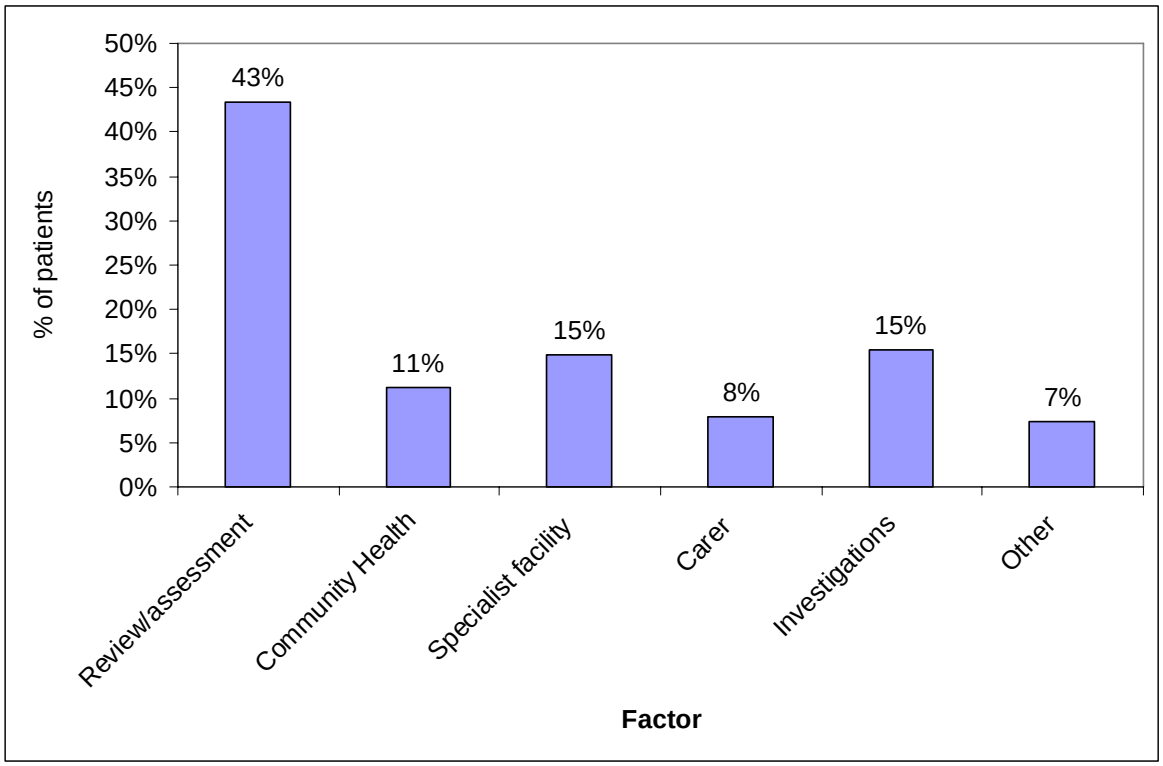
Figure 4.18 Percentage of patients outside and inside AEP with evidence of discharge planning



When the national estimate of the percentage of patients with evidence of discharge planning, is broken down between those outside and inside AEP of the day of care, it can be seen that for patients outside AEP, the level of discharge planning is 58%, whilst for those inside AEP, it is much lower (29%).

4.3.4 Factors Affecting Discharge

Figure 4.19 Factors affecting discharge for patients outside the AEP

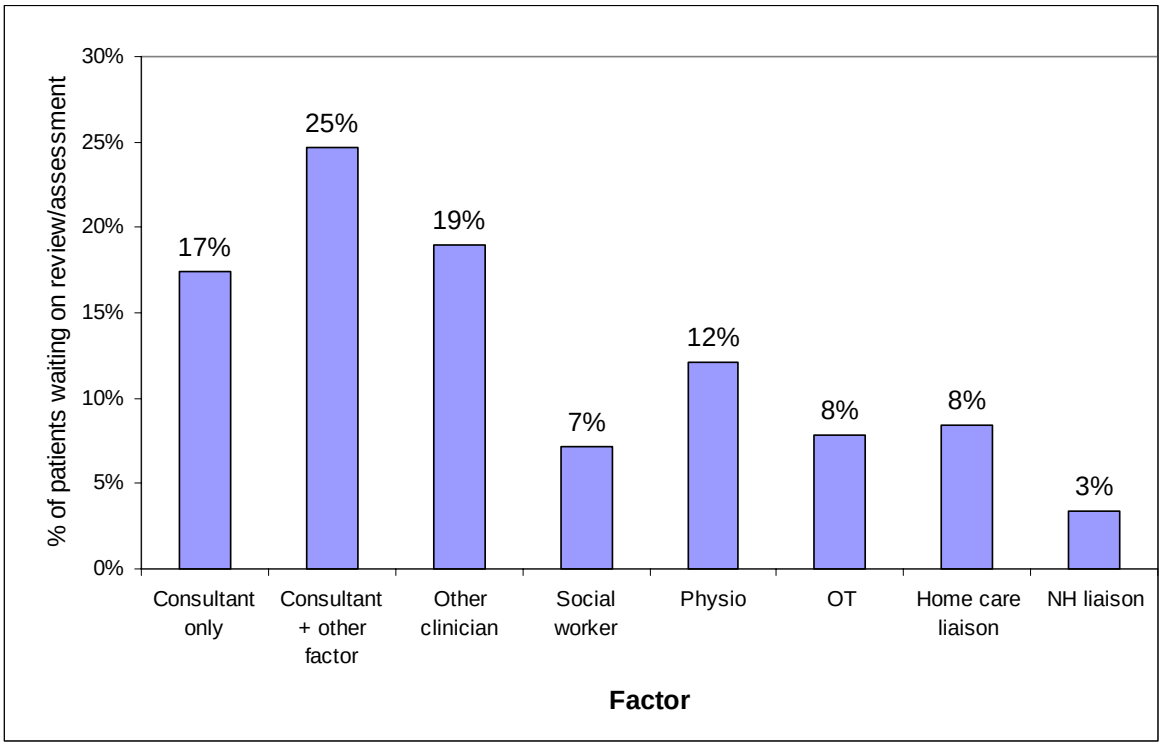


Analysis of the factors affecting discharge for patients outside of the AEP shows that 43% are linked to ongoing review and assessment by clinical staff. Results ranged from 32% in the North East and Dublin North to 50% in the Southern Network and West/North West, however in all networks this was the most common factor.

The second most common reasons for delay of patients that did not meet AEP criteria were the wait for investigations and access to specialist facilities. With regards to investigations, this varied between 11% in the Southern Network and Dublin North, to 20% in West/North West. With regards to specialist facilities, this varied between 9% in Dublin South, to 22% in the South East.

Breakdown of Review/Assessment Element of Discharge

Figure 4.19a Breakdown of the review/assessment element of discharge



Of patients awaiting review or assessment, 61% were waiting to see one or a number of clinical staff. This statistic is reached by totalling Consultant only, Consultant + Other Factor and Other Med (ie other clinician).

In total 20% of patients were waiting for a physiotherapist or an occupational therapist.

4.4 Summary of National Data

This section provides a summary of the data in Sections 4.1, 4.2 and 4.3.

4.4.1 Patient Profile

- 63% of the survey population were 65 years of age or over
- 64% of the survey population were medical admissions
- Hypertension (25%), IHD (22%) and COPD (16%) were the most common comorbidities
- 71% of the survey population presented with at least one comorbidity and 40% had at least two
- Patient over 65 years of age were more likely to present with multiple comorbidities
- 52% of the survey population were on multiple medications
- Over one third of the survey population were referred by a GP and 30% were self-referrals
- 76% of the survey population were admitted from their own homes
- 44% of the survey population arrived in the afternoon and evening.

4.4.2 Day of Admission

- 13% of the survey population were admitted outside of the AEP criteria. This ranged between 8% and 19% across networks
- I/v therapy was the only AEP criterion identified for 12% of the survey population
- 31% of elective surgery patients did not meet the AEP timeliness or location criteria
- Access to assessment and diagnostics was the most common alternative to acute admission, identified for 39% of the patients outside of the AEP criteria, followed by non-acute bed with therapy (15%) and own home and GP (7%).

4.4.3 Day of Care

- 39% of the survey population were outside of the AEP criteria on their day of care. 13% of these patients were receiving physiotherapy or occupational therapy.
- Approximately 50% of patients identified as outside the AEP criteria were discharged within one week of the survey
- Non-acute bed with therapy support was the most common alternative to acute care identified for 23% of patients outside of the AEP criteria on their day of care. This was followed by access to assessment/diagnostics at 18% and own home and GP at 10%
- 71% of alternatives identified for patients outside the AEP criteria were community based
- Discharge planning was in evidence for 40% of the survey population and 58% of the patients outside the AEP criteria on their day of care

- An average of 17% of patients did have predicted dates of discharge
- 43% of factors affecting discharge were linked to review and assessment by clinical staff.

5. Implications of the Survey Findings for Healthcare in Ireland

5. Implications of the Survey Findings for Healthcare in Ireland

The purpose of this section is to analyse the implications of the survey data and to discuss strategies to tackle the issues raised, based on international best practice.

The outputs of the network consultation sessions are also drawn upon to ensure the challenges, opportunities and priorities identified are valid and beneficial in the context of healthcare delivery in Ireland.

To ensure a common understanding of the survey implications, this section begins by setting out the HSE Transformation Programme and presenting the features of international best practice models of healthcare delivery.

5.1 Context for Irish Healthcare Reform

The HSE Transformation Programme sets out an ambitious programme of change to be undertaken by the Irish health service.

The vision is defined as: everybody will have easy access to high quality care and services that they have confidence in and staff are proud to provide. Six transformation priorities have been identified:

1. Develop integrated services across all stages of the care journey
2. Configure PCCC services to deliver optimal and cost effective results
3. Configure hospital services to deliver optimal and cost effective results
4. Implement model for prevention and management of chronic illness
5. Implement standards based performance measurement
6. Ensure all staff engage in transforming health and social care.

It is clear the course for change set by the HSE Transformation Programme is aligned with the international best practice healthcare delivery.

Consideration of systems working towards best practice healthcare delivery reveals a striking consensus on the direction of change across reform agendas and service blueprints. Common themes from countries such as Australia, the UK, New Zealand, Canada and the United States are grouped into the features highlighted below in Figure 5.1.

Figure 5.1 Features of International best practice healthcare delivery

The patient is at the centre of healthcare delivery

Services are designed to meet patient needs and expectations. This includes the location of care, the ease of access, the timeliness of provision and the quality of care delivered. The whole system, including prevention, diagnosis and treatment, rehabilitation and long-term care is seen from the perspective of the individual patient, with appropriate structures in place to support an integrated, collaborative, co-ordinated approach to delivery. The patient is involved in their own care and supported in self-management.

There is an emphasis on illness prevention and ensuring earlier intervention

Action and resources are targeted to prevent ill-health through education, dedicated health programmes and provision of support to higher risk patient groups such as the elderly.

The delivery focus is shifting from the acute setting to care at or close to home

A range of community pathways and care packages are used to meet patient needs without the need for acute hospitalisation. Integrated care networks provide services through collaborative working across primary, community and acute care. Local and community services are invested in and developed, to facilitate local access to diagnostics. Provision of generalist services at community level is complemented by greater specialisation within acute hospital services and the increase of managed clinical networks. This involves the reorientation of care and funding towards management of chronic disease and long-term conditions.

The needs of older people and long-term care are being met differently

The needs of older people can and should be met in an environment of their choice, which surveys suggest is usually the home (as long as there is easy access to community-based services). There is a trend toward more choice and participation for users of long-term care services and support for home- and community-based care as an alternative to institutional care is growing; policies to sustain the efforts of informal caregivers are gaining in popularity; consumers are increasingly being given the choice between having agencies hire and direct their care assistants and being allowed to do this on their own; competition and the growth of local "markets" for home care is increasingly being seen as a way to improve quality and cost-efficiency; and countries differ in the way that consumer-directed care programs are organized.

Internal hospital processes are optimised to reduce patient delay

Patient discharge is planned prior to or within 24 hours of admission, and monitored and progressed through multi-disciplinary, team-based working across the acute and community sectors. Diagnostics and assessment capacity are pitched to meet typical patient demand, and this includes ensuring availability in the evenings and at weekends.

The increasing burden of chronic disease is recognised and responded to

Patients with long-term or chronic conditions are treated and managed outside of the acute setting and the importance of continuity of care is emphasized. Patients with chronic diseases are identified, stratified by risk, involved in their own care and have timely access to multi-disciplinary care in the least intensive setting. Whilst this care is largely delivered in the primary and community care setting, the beneficial impacts on secondary and emergency services are recognized.

5.2 Summary of AEP Findings

The term 'appropriateness' is defined in terms of the potential for alternative types and locations of care, rather than any absolute measure of clinical need, and there are no 'desirable' benchmarks. The patients identified as inappropriate still require care – the data indicate this care could be more appropriately delivered elsewhere if alternatives were available. The way in which beds are currently utilised as reflected in the AEP results, is an outcome of the system as a whole, rather than the way one part of the patient pathway – the hospital - is functioning. These data therefore, whilst they have been collected in the acute setting, indicate a need for transformational change in the way care is delivered to patients across the whole health system.

13% of hospital admissions and 39% of hospital days reviewed by the survey were considered inappropriate based on the AEP criteria.

The rates of inappropriateness varied considerably across networks:

- Inappropriateness on the day of admission varied between 8% and 19%
- Inappropriateness on the day of care varied between 36% and 47%.

Whilst these percentages initially appear high, they are consistent with the results of similar surveys undertaken in Ireland and internationally. Studies have shown that up to 20% of hospital admissions and 20% to 40% of total patient days are inappropriate, as detailed in the literature review.

The network variation is the result of a myriad of elements, ranging from the casemix and specialty mix of network hospitals, through current referral, admission and discharge practice, to the availability of community based alternatives. This variation is addressed at a high level in this section and in detail in each Network Appendix.

AEP rates are just two data items captured as part of this study. A wealth of contextual patient data were also gathered.

The following sections step through each stage of the pathway, drawing out the implications of the data and discussing strategies for tackling the issues revealed, based on Irish and international best practice.

5.3 Illness Prevention and Management

The survey data provide us with a rich profile of the admitted patients.

Across the national survey population, 62% of the patients were 65 years of age or over, which is significantly older than the Irish national population profile in general. This was considerably higher in the North East, at 76% of patients surveyed. At the North East consultation it was expressed that during December the number of older and acutely sick patients was disproportionately high, so this may account in part for the variation.

A high proportion of patients (69%) presented with at least one co-morbidity. Prevalence of comorbidity was similar across networks, with the exception of the high of 79% in the South East and the low of 65% in West/Mid West. Of the patients surveyed, 40% had at least two comorbidities. Those under 65 years of age were considerably less likely to present with co-morbidity.

The following were the most common comorbidities amongst the survey population:

- Hypertension (25%)
- IHD (22%)
- COPD (16%)

- Diabetes (12%)

I/v therapy was the only AEP criterion identified for 12% of patients.

A high proportion of patients were on multiple medications – at 52%, over half of the survey population. It should be noted that these patients were on multiple medications at the point of admission, and this does not include additional medications that may have been prescribed thereafter.

Networks confirmed that these older patients presenting with comorbidities and risk factors are typically more complex, both in terms of their treatment and care requirements and the arrangements for their discharge from hospital.

Analysis of the patients charts revealed that 12% of patients were identified as living alone and 12% were highlighted as frail elderly. These proportions are low when compared with similar survey populations in the UK. The consensus at the network consultation sessions was that the true proportion is likely to be higher. However these patient characteristics may not always be evident from the notes.

A low level of carer incapacity (2%) was identified as a risk factor. The network stakeholders however reported that this often only becomes evident towards the end of the patient stay, at the point of arranging discharge, and so would not necessarily be captured in the notes at admission.

The majority of patients (76%) were admitted from their own home. A low volume of patients were admitted from private nursing homes and HSE residential homes (3% and 2% respectively). Of these, i/v therapy was the only AEP criterion identified for 8% of patients. Networks expected the proportion of patients from care homes to be higher, however agreed that these patients can at times be low in number, but high in impact in terms of the resources and support required to treat and care for them.

30% of patients self-referred to the acute hospital, with 36% referred by their GP. This varied across Networks however, with patients in Dublin North and Dublin South (and to a lesser extent Dublin Midlands), much more likely to self-refer.

The emergent picture of the patient population – over 65, on multiple medications, likely to have co-morbidity; underlines the importance of strategies to manage and prevent illness, which will in turn will promote independence and reduce demand for acute care. These strategies include:

- Chronic disease management
- Illness prevention

5.3.1 Chronic Disease Management

The burden of treating chronic disease for the health services is enormous and is increasing. Our existing model of care for these diseases is now inadequate to the challenge, as it is based on episodic treatment primarily in the acute hospital. In the UK the percentage of over 65s living with chronic disease has risen from 48% in 1972 to 62% in 2002. Irish prevalence data is unavailable but is accepted to be close to the UK profile. The survey data show almost 70% of patients have comorbidities, most of which are chronic diseases. The resource impact of chronic disease is high – these patients use over 60% of hospital bed days. It is estimated that 5% of patients account for 40% of bed days and many of these patients have complex chronic disease.

The most common chronic diseases identified amongst the patients surveyed were ischaemic heart disease, chronic obstructive pulmonary disease and diabetes. Chronic disease management approaches have been found to deliver benefits for patients with these types of chronic disease. Chronic disease management is defined as "a system of co-ordinated health care interventions and communications for populations with conditions in which patients health care costs are significant" (Disease Management Association of America, 2006). The focus of these disease management programmes is on preventing acute episodes from occurring, as acute episodes are the result of clinical deterioration and the main cost drivers within the health care setting.

One of the six priorities of the HSE Transformation Programme 2007 - 2010 is to 'implement a model for the prevention and management of chronic diseases. The National Chronic Disease Management Project Steering Committee has recently designed a National Chronic Disease Management Patient Support Programme for HSE. This programme highlights the need for the health service to re-orientate itself to supporting patients in caring for their own chronic disease and by providing the vast majority of care through Primary Care Teams (PCTs) in the community. In development of this programme, the HSE has drawn on international best practice models which have demonstrated clear benefits, including the Evercare and Kaiser models. Evidence shows that systematic, structured care reduces morbidity and mortality in cohorts within these programmes including:

- 50% reduction in unplanned admissions without detriment to health (Gravelle et al, 2007)
- 50% reduction in bed-days for cohort of managed patients
- Decrease in average length of stay by 31% from 6.2 days to 4.3 days (UK DH, 2004).

The HSE is now seeking to implement the National Chronic Disease Management Patient Support Programme.

5.3.2 Illness prevention

Faced daily with treating advanced stages of disease, healthcare staff intuitively understand the value of illness prevention and health promotion. The benefits of incorporating prevention into medical practice have become increasingly apparent over the past 30-40 years, as previously common and debilitating conditions have declined in incidence following the introduction of effective clinical preventive services (Centers for Disease Control, 1994).

A growing literature links the prevalent comorbidities highlighted by the survey data, such as hypertension, heart disease and chronic obstructive pulmonary disease to a number of personal health behaviours (Kochanek et al, 1992). This emphasises the role for prevention in current medical practice in changing the personal health behaviours of patients long before clinical disease develops.

The medical literature has conclusively demonstrated that many individuals can avoid disease and premature death by choosing healthy eating and living habits. These habits can be promoted via national and local public health initiatives and also through reinforcement of messages as part of each patient interaction. For example, the recent audit of Cardiovascular disease (CVS) in Ireland shows major reductions in prevalence, half of which is attributed to preventative measures.

The survey results show that over 70% of admitted patients have comorbidities and over half presented with at least one defined risk factor. An example of targeted illness prevention in the Irish context is Heartwatch, a secondary prevention programme based in

general practice. This is an initiative led by the Department of Health, the HSE and the Irish College of General Practitioners, in collaboration with the Irish Heart Foundation. Its overall aim is to reduce morbidity and mortality due to cardiovascular disease. Ireland has one of the highest CHD death rates within the European Union in those under the age of 65. The patients included are those with a history of proven myocardial infarction (MI), coronary artery bypass graft (CABG) or percutaneous transluminal coronary angioplasty (PTCA). In some areas patients with diabetes are also included. These patients are assessed and monitored on an ongoing basis, with intervention as appropriate or the programme will arrange referral for intervention by other specialist services based in the practice, the hospital or the community. A report on the programme's progress after one year, which was published in December 2004, found statistically significant improvement in the control of identifiable risk factors amongst patients who had attended four visits as part of the programme.

The fact that a large proportion of patients surveyed have multiple comorbidities and the evidence of the benefits of a population approach to chronic disease management, suggest that going forward, building on the single disease prevention model, many diseases need to be targeted as part of prevention strategies.

5.4 Alternatives to Acute Admission for Patient Care and Treatment

Across the national survey population 13% of the patients admitted were outside the AEP criteria, and in some instances could potentially have been treated outside an acute hospital setting.

It should be emphasised that it might not be known or obvious at the time of admission that the patient was outside the AEP criteria and the results should not be interpreted as suggesting that *all* of these patients might have had alternatives to acute admission. Admitting only patients that require acute care is neither an attainable nor a reasonable goal and it is important to understand the level of risk associated with the threshold for inappropriate admissions. The data confirm however that there is value in considering how some admissions could be prevented or avoided.

Surveyors also recorded 12% patients nationally for whom i/v therapy (including for example medication or fluids) was the only AEP admission criterion met. This varied between 8% and 19% by network. As discussed above, although these patients are within the AEP, professional opinion now suggests that many of these patients could receive such therapy outside an acute location.

The elective surgery AEP was used to assess the appropriateness of timeliness of admission and appropriateness of care location for these patients. The sample size for this cohort was small both due to the time of year and reported high levels of cancellation for elective surgery.

The AEP assessment of timeliness of admission for elective surgery patients is strict – as it assumes day of surgery admission should be the norm. The current bed pressures however lead to a practice in most networks of admission on the night before surgery to avoid cancellation.

By far the most significant alternative to admission identified was access to assessment and diagnostics. This was followed by 'non-acute bed and therapy' and 'own home and GP'. A range of options based at home – 'home and therapy'; 'home and specialist nurse'; 'home and community nurse' as well as 'home and care package' featured consistently

across the networks, illustrating the diversity of demand for the close to home patient care espoused by international best practice.

These themes were repeated in the identified alternatives to acute hospitals on their day of care. Access to a 'non-acute bed and therapy' was the most common alternative identified, followed by home based care, then access to assessment/diagnostics.

76% of patients surveyed were admitted from their own homes. Considered in the context of the patient profile and the prevalence of home-based care as an alternative to admission, these data underline the importance of the development of care at home.

Analysis indicates that patients that arrived in the later afternoon – possibly related to GP and outpatient referrals – were slightly more likely to be outside of the AEP. Networks indicated that these patients were less likely to get timely access to diagnostics.

These data clearly build the case for increasing provision of intermediate care and alternative care sites, and highlight the importance of community and primary care teams in preventing admission and supporting timely discharge.

5.4.1 Development of Intermediate Care Services

There are many definitions of intermediate care. In this context, it refers to 'those services which will help to divert admission to an acute care setting through timely therapeutic interventions which aim to divert a physiological crisis or offer recuperative services at or near a person's own home'.

The primary focus of 'step up' intermediate care services is to enable people to stay at home. The data indicates the importance of building capacity of a range of home-based alternatives to hospital admissions.

The data suggest the following forms of intermediate care should be considered as part of network services re-design:

- Home based nursing and therapy provision in conjunction with home care
- Bed based services in sheltered housing, care homes (residential/nursing homes) and community hospitals
- The ability to carry out a range of nursing treatments such as provision of i/v therapy, post operative intervention and rehabilitation
- Single point of access into intermediate care from a community/A&E/MAU setting
- Ensuring that patients/clients in care homes (residential and nursing homes) have access to specialist community nursing (eg tissue viability, COPD etc) and therapy services when needed as in-reach to the home.

A 'Hospital in the Home' (HITH) initiative is currently being piloted in Dublin.

Intermediate care services to prevent admission should be closely linked to discharge services and there should be flexibility in services to meet changing demand between discharge and prevention. The on-going development of community nursing and therapy services to provide intermediate step-up and step-down care for older people within their own homes or as part of community hospital developments must a core element of any new capacity to provide alternatives to acute stays.

The Winter Initiative, initially put in place to ease pressure on acute beds in winter, involves the implementation of a concentrated plan of action spanning both hospital and

community settings and provides good examples of intermediate care strategies that work in an Irish context. A key element of the Winter Initiative is to ensure that patients requiring care are treated in appropriate settings away from acute hospitals, unless it is otherwise deemed clinically necessary. Strategies implemented include strengthening the provision of community and home-based care by increasing GP out of hours services; increasing Home Help hours at every Local Health Office; increasing home care packages and increasing day care services at every Local Health Office.

Primary Care Teams are also expected to play a role in the prevention of avoidable admissions. These teams focus on a small local community scale (approximately 10,000 people) and provide individuals with access to a wide range of health and social care services in one location including GP, Public Health Nurses, Physiotherapists and a range of different therapists and support workers. A key feature of Primary Care Teams is that each patient has one care plan, one shared file and accesses services through a single Key Worker. This reorientation enables patients to access care in the appropriate setting and reduces avoidable admissions.

5.4.2 Community Intervention Teams (CIT):

The role of the Community Intervention Team is to provide a rapid response from community services to patients (for example nursing services and home care assistants) so that unnecessary hospital admissions can be avoided and the patient can be cared for at home in their community where most prefer to stay.

Where Community Intervention Teams are already in existence (in Dublin, Cork and Limerick), outcomes such as the prevention of patients having to re-attend A&E for procedures such as unblocking a urinary catheter have been observed. In other cases, patients in A&E departments were discharged home to the care of the Community Intervention Team; instead of being admitted to a ward to wait while the necessary community services required were put in place.

An English study also found that the introduction of a multidisciplinary primary care team (GPs, community nurses, nurse co-coordinator, social worker, care attendants) was associated with the ability to keep patients at home in times of crisis, a reduction in emergency admissions and shorter lengths of stay for patients when they were admitted. The introduction of teams was also associated with high levels of patient and carer satisfaction (RPSGB, BMA 2000; Powell et al, 2000). An American study has shown that interdisciplinary team working involving doctors, nurses and social workers can lead to reduced hospitalisations and maintain health status for elderly patients with chronic diseases (Wilson, 1998).

5.4.3 Alternative settings for administration of i/v therapy

Treating patients requiring i/v therapy only in non-acute settings would support the care of patients in or close to their own homes and also help to relieve the increasing demand for hospital beds. Strategies could include increasing the intermediate care focus of nursing homes by training staff to administer i/v therapy. The consultation sessions undertaken with each network suggested a mixed appetite in the non-acute setting, such as nursing homes, for taking forward this role. Studies in counties where home or community intravenous therapy programmes are well developed, such as the United States and Holland, demonstrate reductions in both costs and hospitals bed day requirements associated with the approach (Nathwani et al, 1996).

5.5 Alternatives Settings for Assessment and Diagnosis

The survey findings, combined with the feedback received at network consultation sessions, indicate that access to diagnostics is an important factor in both the level of inappropriate admissions and delays experienced by the patient during their acute hospital stay.

Access to assessment/diagnostics was the most common alternative identified to admission. It was also the third most common alternative to acute hospital that would reduce patient days of care.

The data shows a correlation between patients presenting later in the day and inappropriate admissions. The network consultation sessions confirmed that access to diagnostics out of hours is limited (although this is being tackled in some areas via the Winter Initiative and as part of Working Time Directive Pilots) and that extended day diagnostics would be of major benefit in reducing inappropriate admissions. The consensus was that the barriers to extending access to diagnostics and ensuring availability of results interpretation, were linked to industrial relation issues.

Tertiary hospitals also raised the issue of patients attending for complex investigations or diagnostics, which, although they may not satisfy the AEP criteria, may be deemed appropriate admissions by individual hospitals as these patients may have long distances to travel to access these services, and hostel or other accommodation is not available.

In all areas, the vast majority of diagnostic services are provided in the acute setting.

These data highlight the need for improved timely access to assessment and diagnostics.

5.5.1 Role of the Medical Assessment Unit (MAU)

The MAU can have an important role to play in facilitating access to diagnosis and assessment and avoiding admission. Some hospitals have set up short-term booking of diagnostics via MAUs to GPs, for example Roscommon and Castlebar. MAUs can form a central point for a range of pathways for patients referred for immediate medical assessment, who otherwise would be admitted to facilitate rapid investigation and assessment. These include:

- Provision of facilities for next day assessment in an outpatient clinic.
- GP out of hours services linked to intermediate care/community based rapid response
- Therapy and social work teams in A&E on 24 hour basis to identify patients immediately suitable to return home with support or for intermediate care
- Direct referral from community to MAU or other facility to provide rapid access to diagnostics
- Direct referral from A&E/MAU to community nursing/intermediate care/rapid access home care.

5.5.2 Community Based Access to Diagnostics

Increasing the diagnostic ability in primary care can reduce the need to admit patients for diagnostics, or even the need to refer patients to hospital diagnostic services. This can be a community-based facility or network of facilities offering protocol driven investigation based around a variety of tests in support of primary care. Protocol based models can

support the receipt of referrals from local GPs, Allied Health Professionals and community nurses.

GPs in a number of areas now have enhanced direct access to X-Ray and ultrasound for their patients. This has been shown to reduce patient delay in receiving their diagnostic test and reducing the need for admission to hospital for such diagnostic services.

An example of this initiative includes an enhanced public hospital service to GPs in the South and West through extended hours of opening. This development began in the latter period of 2006 and so far has provided an additional 3,103 tests (1,515 x-rays and 1,588 ultrasounds) to GP-referred patients in December 2006.

This programme of extended hours of opening was provided at Sligo General, Galway University, Mayo General, Limerick Regional, St. John's Limerick, St. Luke's Kilkenny, Wexford General and Kerry General Hospitals. Similar services will be extended to GPs in the catchment areas of South Tipperary and Waterford Regional Hospitals and discussions are also being finalised in the Cork area. An initiative is also underway to facilitate access to x-ray and ultrasound services directly through a list of private providers in the Dublin area. The development began in the latter period of 2006.

5.5.3 Rapid Access Clinic

A rapid access clinic has been introduced as part of the Winter Initiative drive to avoid admissions.

This clinic offers prompt outpatient assessment of patients over 70 years of age by a dedicated geriatric team to avoid unnecessary hospital admission. Patients with sub-acute illnesses are treated and returned home or referred onwards.

Approximately 85% of patients go home after treatment at the clinic and as such avoid waiting periods in hospital EDs. The clinic offers diagnosis, triage and assessment as well as fast track admittance to St Mary's Hospital, if required.

The service has the capacity to treat up to 4,000 patients per year and is on target to do that in 2007. Many of the patients would traditionally have been admitted via the ED, causing stress to patients and extra pressure on the service.

5.6 Discharge Planning and Onward Referral

The survey data show low levels of discharge planning for the patients surveyed. The interpretation of discharge planning used was very wide and inclusive – any evidence of the planning of the steps of care or process supporting discharge in the patient notes was considered.

Discharge planning was in evidence for 40% of patients surveyed and 17% of patients had an estimated date of discharge. Discharge planning is a fundamental aspect of maximising available bed capacity. Planning patient care pre-admission (for elective patients) and shortly after admission can enable hospitals to reduce length of stay by a small factor but across a high volume of patients.

In some of the hospitals surveyed in the Dublin Networks, poor access to long-term care has effectively 'blocked' access to acute hospital beds. Lack of access to intermediate and at-home care services that enable people dependent on care to stay at home contributes to this issue.

These data highlight the capacity gap in long-term and non-acute care beds and underline the need to improve internal hospital planning and discharge processes to maximise existing and any additional capacity.

5.6.1 Increased Provision of Long-Term Care Beds

As discussed earlier in this section, a high proportion of admitted patients are over 65 years of age. A sub-set of these patients are unable to return home after treatment. There are issues securing places for these patients in long-term care locations such as nursing homes. These patients were low in volume in most hospitals surveyed but they have a high impact of bed utilisation, as they tend to have long lengths of stay.

Access to 'Non-acute Bed and Therapy' was the most common alternative to acute care identified on surveyed patients' day of care.

Dublin North and Dublin South in particular highlighted the issue of a lack of long-term care beds. Review of the data and discussion of the issue at the network consultations highlighted the lack of capacity. The HSE has committed to provide 1,210 new long-term care beds in 2007.

In other healthcare systems, the focus of long-term care delivery is shifting out of the traditional nursing home. Nursing home use in the US is declining despite an aging population. The nursing home of the future may primarily care for two populations, one needing short-term rehabilitation, and the other needing complex and end-of-life care (NY Healthcare Commission, 2006).

5.6.2 Discharge Planning

Discharge planning is the development of an individualised, discharge plan for the patient prior to leaving hospital for home, with the aim of avoiding delays, maximising use of beds and improving patient outcomes. It has also been suggested that discharge planning can reduce unplanned readmission to hospital (Parkes, 2002).

Systematic discharge planning can lead to a small reductions in length of stay for a high volume of patients across the hospital and thus have a significant impact on overall bed utilisation. The NHS Modernisation Agency's 10 High Impact Changes for Service Improvement and Delivery estimates that orchestrating effective discharge would deliver the following benefits:

- 10% of total bed days could be released for other activity
- Average length of stay could be the same regardless of day of admission
- A similar percentage of patients could be discharged every day.

Discharge delays create an upstream tidal wave of patient flow constraints which negatively impacts patient satisfaction, safety, hospital capacity, and financial performance.

Actions to improve discharge planning include:

- Establishing regular decision making ward rounds at least once a day
- Implementing nurse-led or protocol-led discharge
- Identifying lead-in times required, eg test, and test result availability, medicines, transport, social services

- Planning around the lead-in times
- Matching time of discharge with time beds are required on an hourly basis.

The use of estimated dates of discharge as part of discharge planning supports the hospital in planning and managing its patient load and its bed capacity. The trend in healthcare internationally is to plan discharge for elective patients prior to admission, and to aim for setting a discharge date for non-elective patients within 24 hours of admission.

5.6.3 Transfers of Care

A large contributor to delayed discharges is the challenge of coordinating post-hospital care. Effective discharge planning supports the continuity of healthcare, between the health care setting and the community, based on the individual needs of the patient. It is described as "the critical link between treatment received in hospital by the patient, and post-discharge care provided in the community" (NSW Health, 2005). Several networks reported a lack of clear processes for transferring patients from acute hospitals to the community. This is exacerbated by poor availability of out of hours transport and acceptance of patients by care homes or the community.

As part of the strategy to reduce delayed discharge in the NHS, since January 2004 if a patient is delayed in discharging from acute services solely because supporting community care arrangements are lacking, the culpable local authority will have to financially reimburse the relevant NHS acute trust. As part of the arrangement, trusts will have to notify social services departments of patients who may require community care.

The HSE is currently developing a Complex Discharge Unit (60 beds) in Dublin 1 to serve the in-patient population of Mater and St. James's Hospitals. Patients who have completed their acute medical episode of care, (ie post orthopaedic surgery, pneumonia, stroke), and are well enough to be discharged from the acute hospital setting may have to wait while their discharge plans are being completed (ie their home care package is being arranged or their rehabilitation/ needs further intervention). Now it is planned for such patients to be discharged from the acute hospital bed to this Unit. This new development is expected to start later in 2007.

6. Conclusions and Recommendations

6. Conclusions and Recommendations

6.1 Conclusions

The survey data combined with the consultation undertaken with each network and the features of international best practice healthcare delivery lead to the following conclusions:

Conclusion 1: This review concludes that the most influential factor determining appropriateness of bed utilisation is how the care system in place manages the patient, rather than the characteristics of the individual patient.

Recommendation 1: The recommended changes to service configuration and care delivery in this report to increase appropriate placement of patients should be taken forward as part of the HSE Transformation Programme.

Conclusion 2: The data confirm that additional and different capacity is needed if patients are to be more appropriately placed. In particular, the data support the shift towards a wide spectrum of home and community based care, and away from the acute, inpatient setting. Acute hospital admissions and acute length of stay could be reduced if access to the following alternatives was improved:

- Assessment/diagnostics
- Non-acute beds with therapy support
- Home-based patient care including GP support, therapy, specialist nursing, community nursing and home care packages.

Recommendation 2.1: Increase provision of a broad spectrum of community and home-based care to avoid admissions, facilitate timely discharge and ensure convenient, patient-centred care. These care options include:

- Improved access to specialist nursing eg to support management of chronic diseases outside of the acute hospital
- Resources to support provision of i/v therapy in the home
- Improved access to home care packages and community nursing to support self-care, anticipatory care and co-ordinate access to services.

Recommendation 2.2: Increase access to diagnostics and assessment without admission to the acute hospital setting. Based on the survey data, this includes:

- Extended hours access to diagnostics and assessment
- Creation of community based diagnostic capacity
- Roll-out of MAUs to facilitate assessment without admissions where clinically appropriate and protocol based access to diagnostics
- Improved GP access to hospital and community diagnostics to reduce delays and avoid unnecessary admissions.

Recommendation 2.3: Increase the range of non-acute bed-based alternatives available.

- Confirm the scale of the capacity gap for long-term care and other non-acute beds at Hospital Network level
- Identify opportunities to improve access to non-acute beds through better utilisation
- Increase non-acute bed capacity in the context of the role of the non-acute bed as one aspect of the spectrum of non-acute care

Conclusion 3: The survey confirms there is significant opportunity to use the current complement of acute beds more efficiently through changes in hospital practice. The review highlighted the need to improve the internal hospital organisational factors that influence length of stay, bed occupancy and bed utilisation. This includes the configuration of ward rounds, introduction of discharge planning and management and multi-disciplinary working to reduce delay in assessment and discharge.

Recommendation 3.1: Implement protocol-based discharge planning and use of estimated dates of discharge. Based on the findings of this review, this should include:

- Implementing protocol-led discharge
- Early involvement of PCCC in the planning of patient discharge and transition to non-acute care.
- Identifying lead-in times required, eg test, and test result availability, medicines, transport, social services and planning around the lead-in times
- Multi-disciplinary, team-based working to reduce delay during care and at discharge
- Establishing regular decision making ward rounds at least once a day
- Matching time of discharge with time beds are required on an hourly basis.

Recommendation 3.2: Review internal hospital processes to reduce patient delay.

- Revising processes for patient assessment and review to ensure timely access to senior decision-making
- Support the provision of timely access to assessment and diagnostics

Conclusion 4: The review signals a need for the re-orientation of services to ensure more appropriate placement of patients, which demands far greater integration of care delivery across health providers at a local level. Optimising any one aspect of the patient pathway in isolation will not deliver optimum care across the whole system as all of the above factors interact with each other in a systematic way. These interactions are often complex, but they can be predicted and managed.

Recommendation 4: Adopt an approach of joint-working across providers within and outside of the acute setting to implement the recommendations of this review at local level.

Conclusion 5: There is a need to increase the focus on illness prevention and management

Greater identification and management of high-risk populations and those with chronic disease is necessary to minimise admissions and optimise use of additional home and community based support.

Recommendation 5: Accelerate the implementation of the National Chronic Disease Management Strategy

Conclusion 6: The HSE now has the trained staff, tools and supporting materials necessary to undertake acute bed utilisation review. Such review should become an integral part of HSE business as usual activity.

Recommendation 6: Undertake the survey at hospital level (100 survey sample size) to inform detailed local planning and performance improvement and to assess the impact of changes made as a result of this study.