

# Acute Hospital Bed Capacity

A National Review



DEPARTMENT  
OF HEALTH AND  
CHILDREN  
AN ROINN  
SLÁINTE AGUS LEANAÍ



Baile Átha Cliath

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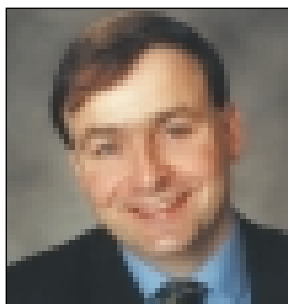
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## Minister for Health and Children's Foreword



It gives me great pleasure to publish the National Review of Acute Hospital Bed Capacity, the most comprehensive exercise of its kind ever conducted in this country.

For some time, it has been evident that the capacity of our acute hospital system has not kept pace with the increasing demands being imposed on it. The consequences of that under-capacity are well known, i.e. cancellation of elective admissions, long delays in accident and emergency departments, waiting lists for elective procedures and unacceptably high bed occupancy levels in the major hospitals.

In the *Programme for Prosperity and Fairness*, the Government committed itself to arrange a detailed review of acute hospital bed capacity to be carried out by the Department of Health and Children in conjunction with the Department of Finance and in consultation with the Social Partners. In conducting this exercise, my Department also consulted with the health boards and Eastern Regional Health Authority, bodies representing health professionals working in the acute hospital system and representatives of the community and voluntary sectors.

This Review is the product of that exercise. It reviews changes in acute hospital capacity and activity over the period 1980 to 2000; it provides an estimate of the number of additional beds required to eliminate current gaps in capacity, it examines the factors that are likely to increase the need for additional beds and it provides an assessment of the additional capacity required up to 2011. It also outlines strategies that could be adopted to reduce the number of additional beds required.

Estimating future demands, particularly demands for hospital services, is not an exact science and the Review outlines a range of variables which affect the determination of acute hospital bed requirements. Having carefully considered all the relevant factors and having particular regard to the developments in relation to Primary Care and Services for Older People envisaged in *Quality and Fairness: A Health System for You*, the Government have decided to provide for an additional 3,000 acute hospital beds by 2011. This represents a planned increase of over 25% in acute hospital bed capacity and is the most ambitious such commitment in the hospital system since the foundation of the State. It is a clear demonstration of the priority which this Government accords to the health services. The first 650 of the extra beds will be provided during 2002 of which 450 will be in the public system and 200 will be contracted from the private hospital sector. These beds will provide additional capacity for the treatment of public patients on waiting lists.

Of course, it is not enough to provide additional hospital beds; there will be a need for a substantial increase in the number of medical, nursing and other hospital staff. *Quality and Fairness: A Health System for You* sets out a range of initiatives that are being, or will be, taken to recruit and retain the additional staff required.

The Government have also decided to establish a National Hospitals Agency to oversee the reconfiguration of the hospital system and to prepare a strategic plan for the expansion of capacity announced in the Health Strategy. Pending the establishment of the Agency, my Department will initiate steps to determine the most appropriate distribution of the additional capacity by specialty and by region, in consultation with health boards and the ERHA, professional bodies and other relevant interests.

Finally, I wish to thank all who have contributed to the preparation of this report, and to acknowledge the pivotal role played by Clinical Epidemiologist, Dr. Mary Codd, who acted as Consultant to my Department for this exercise. The Report has been of inestimable value in developing the Health Strategy and in providing a framework for further reviews of bed capacity in the years ahead.

**Micheál Martin, T.D.**

Minister for Health and Children

# Table of Contents

<b>Foreword</b>	2
<b>Abbreviations</b>	4
<b>List of Tables</b>	5
<b>List of Figures</b>	6
<b>Executive Summary</b>	8
<b>Introduction</b>	12
<b>Section 1</b> Context for Review of Acute Hospital Bed Capacity	16
<b>Section 2</b> International Comparisons of Hospital Bed Capacity	22
<b>Section 3</b> Trends in Acute Hospital Activity, 1995 to 2000	28
<b>Section 4</b> Age-specific Acute Hospital Activity, 2000	42
<b>Section 5</b> Current Indicators of Inadequate Hospital Bed Capacity	50
<b>Section 6</b> Factors which will increase the need for Hospital Beds	60
<b>Section 7</b> Strategies to reduce the need for Hospital Beds	68
<b>Section 8</b> Estimating National Bed Need	78
<b>Bibliography</b>	82
<b>Appendix 1</b>	87
<b>Appendix 2</b>	89
<b>Appendix 3</b>	91

## Abbreviations

A&E	Accident and Emergency
AC	Audit Commission
ALOS	Average Length of Stay
BADS	British Association of Day Surgery
DOHC	Department of Health and Children
DRG	Diagnosis Related Group
ENT	Ear, Nose and Throat
ERHA	Eastern Regional Health Authority
ESRI	Economic and Social Research Institute
EU	European Union
HCAB	Health Care Advisory Board
HIPE	Hospital In-Patient Enquiry
ICD	International Classification of Diseases
ICSI	Intensive Care Society of Ireland
ICU	Intensive Care Unit
IMR	Integrated Management Report
LOS	Length of Stay
MDC	Major Diagnostic Category
NHS	National Health Service
OECD	Organisation for Economic Co-operation and Development
UK	United Kingdom
USA	United States of America
VFM	Value for Money

## List of Tables

Table S.1	Additional Acute Hospital Beds Required in Ireland to 2011	10
Table 1.1	Acute Hospital Beds, Inpatients, Average Length of Stay, Day Cases and Outpatients in Ireland, 1980 to 2000	18
Table 1.2	Population of Ireland: Summary Statistics for the Years 1981 to 2000(E)	19
Table 1.3	Acute Hospital Beds per Capita, 1981 to 2000	20
Table 1.4	Acute Hospital Bed Designations in Ireland, 2000	20
Table 7.1	Summary of International Studies of Inappropriate Bed Use	69
Table 7.2	Bed Days Lost due to Delayed Discharge, 2000	70
Table 7.3	Elective Surgery in Ireland, excluding Obstetrics, 2000: Total, AC 'Basket' and BADS 'Trolley' of procedures and operations	73
Table 7.4	Potential to increase Day Surgery and Inpatient Bed Days gained by Specialty	74
Table 8.1	Additional Acute Hospital Beds Required in Ireland to 2011	80

## List of Figures

Figure 1.1	Inpatients, Beds and Day Cases in Ireland, 1980 to 2000	18
Figure 2.1	Inpatient Care Beds per 1,000 Population: OECD Countries, 1996	23
Figure 2.2	Acute Care Beds per 1,000 Population: OECD Countries, 1996	24
Figure 2.3	Average Length of Stay (days): OECD Countries, 1996	25
Figure 3.1	A&E Attendances and % of A&E Attendees admitted to Hospital, 1995 to 2000	31
Figure 3.2	Total Admissions, excluding Obstetric Patients, 1995 to 2000	31
Figure 3.3	Inpatients Discharged, excluding Obstetric Inpatients, 1995 to 2000	32
Figure 3.4	% of Inpatients, excluding Obstetric Inpatients, admitted as Emergencies, 1995 to 2000	32
Figure 3.5	Bed Days Used and Average Length of Stay, excluding Obstetric Inpatients, 1995 to 2000	33
Figure 3.6	Day Cases, excluding Obstetric Day Cases, 1995 to 2000	33
Figure 3.7	% Treated as Day Cases, excluding Obstetric Day Cases, 1995 to 2000	34
Figure 3.8	Outpatient Attendances: Numbers and Rates per 1,000 Population, 1995 to 2000	34
Figure 3.9	Medicine vs Surgery: Total Admissions, excluding Obstetric Patients, 1995 to 2000	35
Figure 3.10	Medicine vs Surgery: Inpatients Discharged, excluding Obstetric Inpatients, 1995 to 2000	36
Figure 3.11	Medicine vs Surgery: % of Inpatients, excluding Obstetric Inpatients, admitted as Emergencies, 1995 to 2000	36
Figure 3.12	Medicine vs Surgery: Bed Days Used and Average Length of Stay, excluding Obstetric Inpatients, 1995 to 2000	37
Figure 3.13	Medicine vs Surgery: Day Cases, excluding Obstetric Day Cases, 1995 to 2000	37
Figure 3.14	Medicine vs Surgery: Proportions of <i>All</i> Patients and of <i>Elective</i> Patients treated as Day Cases, 1995 to 2000	38
Figure 3.15	Medicine vs Surgery: Bed Designations vs Clinical Activity	38
Figure 4.1	Age-specific Distributions of Inpatients Discharged, 2000	43
Figure 4.2	Age-specific Rates of Medical and Surgical Inpatients Discharged, 2000	44
Figure 4.3	Proportion of Inpatients in each Age Category admitted as Emergencies, 2000	44
Figure 4.4	Age-specific Average Lengths of Stay of Inpatients Discharged, 2000	45
Figure 4.5	Age-specific Distributions of Inpatient Bed Days Used, 2000	45
Figure 4.6	Age-specific Rates of Bed Days Used by Medical and Surgical Inpatients, 2000	46
Figure 4.7	Age-specific Proportions of Inpatients Discharged and Bed Days Used, 2000	46
Figure 4.8	Age-specific Distributions of Day Cases, 2000	47
Figure 4.9	Age-specific Rates of Medical and Surgical Day Cases, 2000	47
Figure 4.10	Age-specific Proportions of <i>Elective</i> Patients treated as Day Cases, 2000	48
Figure 5.1	Acute Care Occupancy Rates (%): Selected OECD Countries, 1996	53
Figure 5.2	Estimated Impact of Average Bed Occupancy Levels on Bed Need	54
Figure 5.3	Estimated Impact of ICU Occupancy Levels on Bed Need	55
Figure 5.4	Public Inpatient Waiting List, DOHC, 30 June 2001	57
Figure 5.5	Estimated Impact of Waiting Lists on Bed Need	58



Figure 6.1	Projected Demographic Changes by Age Category to 2011 and 2026	62
Figure 6.2	Estimated Impact of Projected Demographic Changes on Bed Need	63
Figure 6.3	Estimated Impact of Demand for Healthcare on Bed Need	66
Figure 7.1	Estimated Impact of Measures to reduce Delayed Discharge on Bed Need	70
Figure 7.2	Estimated Potential to use Available Capacity	71
Figure 7.3	Estimated Impact of additional Day Surgery on Bed Need	73
Figure 7.4	Estimated Impact of adherence to an 80/20 ratio of Public/Private beds on Bed Need	75
Figure 8.1	Factors which Impact on the need for Acute Hospital Beds	79

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# Executive Summary

The *Programme for Prosperity and Fairness* outlined the commitment of the Government to a review of hospital bed capacity in both acute and non-acute settings, to be carried out by the Department of Health and Children in conjunction with the Department of Finance and in consultation with the Social Partners. The focus of this report is on bed capacity in publicly-funded acute hospitals in Ireland. The capacity needs of the sub-acute sector have been assessed separately in the context of the Health Strategy, *Quality and Fairness: A Health System for You*.

This Review provides an historical perspective on acute hospital activity over the last two decades, including changes in bed numbers, inpatient numbers, average length of stay and day activity. It examines and reports on current acute hospital bed capacity and clinical activity, and it suggests a framework for the estimation of future bed requirements based on current activity levels, current indicators of inadequate capacity, increasing patient demand, potential changes to clinical practice and projected demographic changes.

Estimating future need is a challenge. A health system is not a fixed system, but is a dynamic process with continuously changing inputs and expectations. Demands on acute hospitals may change over time and may be unpredictable. A reasonable approach, however, is to use current activity as a basis for predicting future need, taking account of immediate pressures, the expected impact of patient demand and projected demographic changes and measures with the potential to reduce the need for extra beds. This is the approach taken in this Review.

The facts in relation to current acute hospital activity in Ireland are as follows:

- the number of acute hospital beds in 2000 (11,832) is approximately 6,000 lower than the number in 1980 (17,665);
- the number of acute hospital beds per capita in Ireland is one of the lowest among EU and OECD countries at 3.1 beds per 1,000 population; this compares with 5.1 per 1,000 population in 1980;
- despite the reduction in bed stock since 1980, total hospital activity, excluding outpatients, has increased by 57% since 1980. Outpatient attendances have increased by 37% since 1980;
- the increase in total hospital activity, excluding outpatients, is largely due to a marked increase in day activity. In 1980, approximately 8,000 day case treatments were recorded, constituting 2% of all non-outpatient care. In 2000, there were approximately 320,000 day cases, representing 38% of *all* hospital activity and 68% of *elective* hospital activity;
- inpatient activity levels have been maintained, primarily as a consequence of a steady decline in average length of stay (ALOS). The ALOS is now 6.6 days, reduced from 9.7 days in 1980;
- since 1995 total hospital activity, i.e. inpatients plus day cases, has increased by 20%. Inpatient activity has increased by 2% despite a 1% decrease in bed numbers;
- currently, 71% of inpatients are admitted through A&E departments. These emergency admissions show a preponderance of older patients with medical conditions: 82% of *medical* inpatients are admitted as emergencies; 37% of *surgical* inpatients are admitted as emergencies;
- the age-specific distributions of inpatients and bed day use show that older people have a disproportionate need for hospital services. In 2000, people over 65 years constituted 11% of the total population, comprised 27% of the acute hospital inpatient population and consumed 46% of acute hospital inpatient bed days;
- the proportion of inpatients who are *medical* has increased steadily, with a concomitant decline in the proportion of *surgical* inpatients. In 2000, these proportions were 75% and 25% respectively. This is out of step with current bed designations, resulting in encroachment by medical patients on surgical beds and cancellation of surgical procedures;

- bed occupancy levels are unacceptably high in the major hospitals. Twenty-three hospitals have occupancy levels of greater than an internationally recognised measure of full occupancy of 85%. Among these hospitals the average occupancy level is 95%; the range of occupancy is from 85% to 123%;
- waiting lists continue to put pressure on an acute hospital system which is unable to accommodate elective admissions. Current waiting lists are comprised primarily of patients awaiting surgical procedures in ENT, General Surgery, Gynaecology, Ophthalmology, Orthopaedics and Plastic Surgery. There are currently almost 27,000 patients nationally who have waited three months or more for elective inpatient treatment;
- demographic projections for Ireland suggest that by 2011 the population aged 65+ will have increased by 20% from 421,600 to 503,900. By 2026, people aged 65+ will have almost doubled in number to an estimated 767,300, and will constitute 16.4% of the population. This is a factor of major significance in planning for the provision of acute hospital services;
- demand for healthcare is increasing, related to better education, increased expectations, economic prosperity and technological advances in healthcare, permitting earlier and improved diagnosis and treatment.

Estimation of current and future bed requirements has been carried out taking account of current activity levels, current pressures, increasing patient demand, potential changes to clinical practice and projected demographic changes. The outcomes in terms of bed numbers are presented in Table S1. The *gross estimate* of additional bed need takes account of those difficulties in the hospital system which require immediate attention (occupancy levels and waiting lists) and factors which will increase the need for beds in the future (demographic changes and demand). The *net estimate* assumes parallel investment in strategies aimed at reducing the need for acute hospital beds. These include additional community support services and facilities to allow for timely discharge of patients to more appropriate settings, additional day facilities to allow for substitution of inpatient with day surgery and improved management of existing bed stock.

**Table S.1:** Additional Acute Hospital Beds Required in Ireland to 2011

<b>Acute Hospital Bed Complement in 2000</b>	<b>11,832</b>
<b>Current Indicators of Inadequate Bed Capacity</b>	
Additional beds required to reduce average bed occupancy in major hospitals	883*
Additional beds required to facilitate treatment of Waiting List patients	492*
<b>Factors which will Increase the Need for Acute Beds</b>	
Additional beds required due to projected demographic changes	1,630*
Additional beds required to cope with increased demand for healthcare	1,330 <sup>†</sup>
<b>Additional Inpatient Beds Required (Gross Estimate)</b>	<b>4,335</b>
<b>Strategies with the Potential to Reduce Need for Additional Beds</b>	
Investment in measures to reduce delayed discharge from acute hospitals	675
Potential use of available capacity in some hospitals	200
Substitution of elective inpatient surgery with day surgery	290
Treatment of one-third of waiting list patients on a day basis	170
Improved management of public and private beds for elective patients	160
<b>Potential Capacity within the Existing System</b>	<b>1,495</b>
<b>Additional Inpatient Beds Required (Net Estimate)</b>	<b>2,840</b>
<b>Additional Days Beds Required (in addition to Net Estimate)</b>	<b>190</b>

\* Adjusted for 85% occupancy

<sup>†</sup> Application of the estimate of demand to existing bed complement corrected for occupancy

Correction of current high occupancy levels in major hospitals accounts for 20% of the estimated gross need; Waiting Lists account for approximately 11%. By far the greatest need will be incurred by projected demographic changes (38%) and by increasing demand for healthcare (31%). Among the strategies with the potential to reduce the need for additional beds, investment in measures to reduce delayed discharge from acute hospitals would have the greatest impact. This alone could 'provide' 16% of the capacity required. Investment in day facilities, and a substantial shift of elective inpatient surgery to day surgery could reduce the need for additional beds by 11%. The potential to use available capacity in some hospitals could provide a further 5% of the need. Strict adherence to an 80/20 ratio of public and private beds for elective patients has the potential to contribute 4% of the need identified.

It is essential to record that combined implementation of all of these strategies will not resolve the current capacity deficit. It could provide up to one-third of the beds needed. However, at least two-thirds of the required capacity must be added to the system, in conjunction with significant parallel investment in the strategies outlined.

This Review addresses the issue of hospital bed capacity on a national basis. Assessment of bed needs by region and by specialty will fall within the remit of the proposed National Hospitals Agency as outlined in *Quality and Fairness: A Health System for You*. Pending the establishment of the agency, the DOHC will initiate steps to determine the most appropriate distribution of additional capacity by region and specialty in consultation with the health boards and the ERHA, with professional bodies and other relevant interests.

It is recognised that acute hospital care is just one component of a healthcare delivery system. Hospital services cannot be evaluated in isolation from primary care, community services and specialist care services. The need for hospital services is influenced by the availability and accessibility of those services which can reduce the need for acute interventions, can enable safe discharge to community or home and can act as either substitutes for, or complements to, hospital services. It is also recognised that adding beds is only part of the solution to the difficulties being experienced in the acute hospital system. Clearly, beds must be managed, staffed and resourced in order to be effective. They are, however, the cornerstone of service provision in the acute hospital system.

It is unlikely that this Review will meet with universal approval. However, it is hoped that, as the first systematic attempt to estimate acute hospital bed need in Ireland, it will act as a catalyst for informed debate and planning and provide a framework for future analyses of hospital bed capacity.

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# Introduction

# Introduction

## Background

The *Programme for Prosperity and Fairness* outlined the commitment of the Government to a review of hospital bed capacity in both acute and non-acute settings, to be carried out by the Department of Health and Children in conjunction with the Department of Finance and in consultation with the Social Partners.<sup>1</sup> The focus of this report is on bed capacity in publicly-funded acute hospitals in Ireland. The capacity needs of the sub-acute sector have been assessed separately and are included in the Health Strategy; *Quality and Fairness: A Health System For You*.<sup>2</sup>

The purposes of this Review were:

- to provide an *historical overview* of acute hospital bed complement and activity in Ireland over the last two decades to identify changes which may be relevant to the current provision of acute hospital services;
- to examine and report on the *current* bed complement and utilisation of beds in acute publicly-funded hospitals; and
- to estimate the *need for change* to current bed complement and utilisation patterns, taking account of factors which impact on demand for acute hospital beds at this time and into the future.

## Consultation Process

The review involved consultation with the Department of Finance, the Health Boards and the ERHA. Submissions were invited from each Health Board and the ERHA in relation to perceived capacity needs in their areas and meetings were held with their representatives. Meetings were also held with the Irish Hospital Consultants Association, the Irish Nurses Organisation, the Intensive Care Society of Ireland, the Conference of Religious in Ireland and the St. Vincent de Paul Society. In addition, representations were received from the Irish Medical Organisation.

## Professional Services

Information from the consultation process identified common themes and needs throughout the country, arrived at by varying methods and levels of analysis. The DOHC contracted the professional services of Mary B. Codd, MD, PhD, to collate that information, to take the lead on an objective analysis of acute hospital bed capacity nationally and to produce this report. The professional services of Ms. Lorna Reilly, Executive Assistant, are also acknowledged.

## Structure of the Review

Section 1 outlines the context for a review of acute hospital bed capacity in Ireland. Changes in acute hospital bed numbers and hospital activity between 1980 and 2000 are reviewed, as are population changes over the same period.

Section 2 compares current acute hospital beds per capita with similar data from OECD countries. Recent experiences of selected countries in relation to hospital bed capacity are presented.

Section 3 describes trends in acute hospital activity in Ireland since 1995, based on Hospital In-Patient Enquiry (HIPE) data. Specific attention is given to changes in the relative distributions of medical and surgical patients, and the increasingly high proportion of medical patients admitted through A&E departments.

Section 4 examines acute hospital activity in 2000 with particular attention to the age-specific distributions of inpatients and bed days used as the basis for estimates of future bed requirement due to demographic changes.

Section 5 examines current indicators of inadequate hospital bed capacity and estimates the additional beds which would be required to deal with high bed occupancy levels and waiting lists.

Section 6 estimates the additional beds required to accommodate the emerging pressures of a changing demographic profile and increasing demand for healthcare to 2011.

Section 7 discusses the potential impact of measures which might reduce the need for hospital beds, including the potential to discharge patients in a timely manner and the potential to substitute inpatient with day surgery.

Section 8 combines data from all previous sections to provide estimates of the additional number of beds needed in the acute hospital sector over the next ten years.

The analyses in this Review are based on data made available from relevant agencies. These include: all acute hospitals through the Information Management Unit and Acute Hospitals' Division, DOHC, the Economic and Social Research Institute (ESRI), the Central Statistics Office (CSO), the Intensive Care Society of Ireland (ICSI), health boards and the ERHA and individual hospitals for selected data. Assessing the validity of the data was outside the remit of this exercise. Certain limitations of the available data may have precluded more accurate estimation of need. Much of the data and the analyses supporting this Review have been compiled in a *Technical Report* entitled *Acute Hospital Bed Capacity: A National Review, Technical Report incorporating Supporting Data and Analyses*. This is available on request from the Acute Hospitals' Division, DOHC, Hawkins House, Hawkins Street, Dublin 2 or on the DOHC website, [www.doh.ie](http://www.doh.ie).





## SECTION 1

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# Context for Review of Acute Hospital Bed Capacity

## 1.1 Introduction

This section outlines the context for a review of acute hospital bed capacity in Ireland. Changes in acute hospital bed numbers and hospital activity between 1980 and 2000 are reviewed, as are population changes over the same period.

## 1.2 Context

Acute hospitals in Ireland are experiencing significant difficulties in the delivery of services at this time. There are capacity issues, staffing and resource issues, and dissatisfaction among patients and the general public. Issues which exacerbate or are symptomatic of inadequate capacity include:

- high attendance rates at the A&E departments of acute hospitals;
- long delays in A&E for treatment and/or admission;
- insufficient acute hospital beds to facilitate admission to hospital;
- increasing proportions of hospital beds occupied by patients admitted through A&E;
- cancellation of elective admissions and procedures;
- long waiting lists for elective procedures;
- acute hospital beds occupied by persons no longer in need of acute care; and
- unacceptably high bed occupancy levels in major acute hospitals.

Many are also compounded by shortages of staff and other resources. The net result is that service delivery is compromised. It is recognised that adding beds to the system is just part of the solution. They are, however, the cornerstone of service provision in the acute hospital, and the resource to which all other resources are mapped. Changes in bed complement may be the result of forces unrelated to health or healthcare, but have important consequences for service delivery. A review of changes in acute hospital bed complement in Ireland over 20 years to the present time provides a backdrop to the capacity issues currently being experienced.

## 1.3 Hospital Bed Complement and Activity, 1980 to 2000

Health Statistics for Ireland are published each year by the Department of Health and Children. Included are statistics pertaining to publicly-funded hospital services, such as number of acute hospital beds, number of inpatients discharged, average length of stay (ALOS) and number of day cases. In recent years reports have provided specialty statistics for all hospitals. Outpatient statistics are also provided. Data for these reports come directly from publicly-funded hospitals in the form of a monthly Integrated Management Report (IMR).

Annual Health Statistics reports for each year, from 1980 to 1996 inclusive, were reviewed,<sup>3-16</sup> together with data for the years 1997 to 2000 which have not yet been published in Health Statistics reports.<sup>17</sup> The acute hospitals included in this analysis are as listed in Section H, Acute Hospital Services, Health Statistics 1999<sup>16</sup> and are listed in the *Technical Report*.<sup>see p.14</sup> The number of acute beds, inpatients, day cases, outpatients and ALOS are presented in Table 1.1 and Figure 1.1.

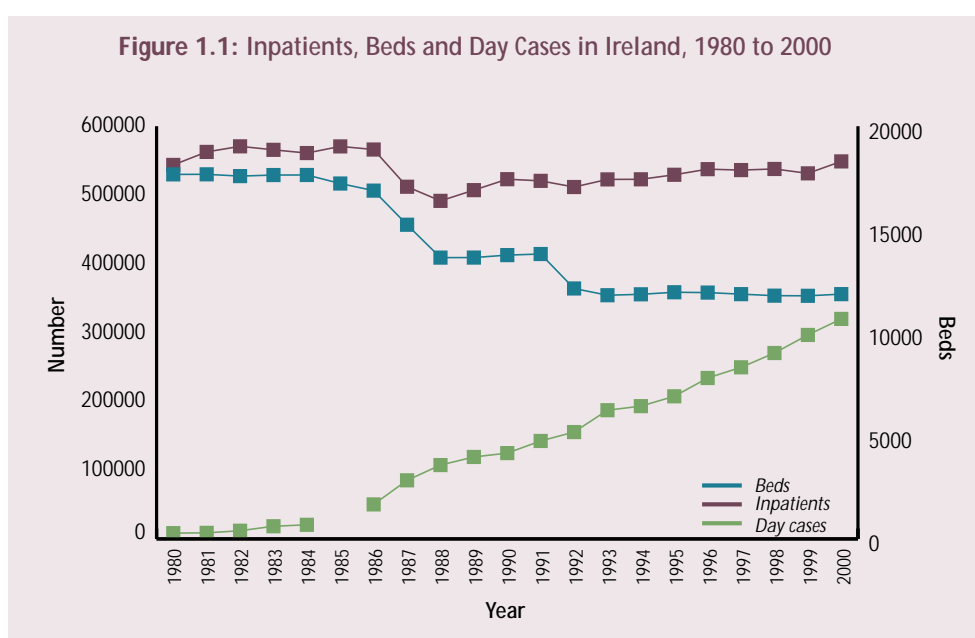
**Table 1.1:** Acute Hospital Beds, Inpatients, Average Length of Stay (ALOS), Day Cases and Outpatients in Ireland, 1980 to 2000

Year	Ref.	Beds†	Inpatients	ALOS	Day Cases	Outpatients*
1980	(3)	17,665	543,698	9.7	8,377	1,460,198
1981	(4)	17,668	562,633	9.4	8,796	1,452,060
1982	(5)	17,582	570,743	9.0	11,879	1,528,242
1983	(6)	17,633	565,658	8.6	18,387	NA
1984	(7)	17,636	560,969	7.5	20,486	1,552,508
1985	(8)	17,223	570,628	7.5	NA	1,574,489
1986	(8)	16,878	566,105	7.4	50,136	1,621,035
1987	(9)	15,225	512,004	7.3	85,167^	1,524,726
1988	(10)	13,632	491,474	7.0	107,352^	1,581,185
1989	(11)	13,634	507,048	6.9	119,131^	1,580,052
1990	(11)	13,753	522,864	6.9	124,748^	1,675,529
1991	(12)	13,806	520,571	6.8	142,394^	1,757,173
1992	(13)	12,136	511,586	6.7	155,326^	1,805,038
1993	(14)	11,809	522,662	6.7	187,101^	1,818,515
1994	(15)	11,853	522,803	6.6	193,018^	1,858,648
1995	(16)	11,953	529,393	6.6	207,308^	1,890,702
1996	(16)	11,937	537,557	6.7	233,908	1,901,292
1997	(17)	11,861	536,236	6.5	249,472	1,928,734
1998	(17)	11,788	537,841	6.5	270,240	1,963,504
1999	(17)	11,781	531,456	6.6	296,533	1,930,942
2000	(17)	11,832	548,834	6.6	319,837	2,006,332

†Excludes day beds NA = Not available

\*Outpatients includes new and return attendances

^The difference between these figures and those reported in the Annual Health Statistics Reports is that the figures here have been adjusted for day care provided in District Hospitals during those years



The number of inpatient beds in Ireland decreased from 17,665 in 1980 to 11,832 in 2000. Approximately 4,000 inpatient beds were removed from the system between 1984 and 1988. A further 2,000 were removed between 1991 and 1993. The number of inpatient beds has remained relatively unchanged since 1993. The number of day beds increased from 26 in 1980 to 562 in 2000.

Despite the reduction in bed stock, the number of inpatients treated has remained remarkably constant over the 20-year period as a whole. In 2000, a total of 549,000 inpatients were treated in public hospitals compared with 544,000 in 1980. It is worth noting that inpatient numbers peaked at 571,000 in 1985 just prior to the removal of acute beds in 1986 and subsequent years.

Inpatient activity levels have been maintained primarily through a steady decline in ALOS. The ALOS now appears to have stabilised at 6.6 days, reduced from 9.7 days in 1980. Since 1993, the number of inpatient beds has remained quite static. However, due to population growth, the number of beds per capita has decreased. The number of inpatients has increased. The consequence is that occupancy levels in many acute hospitals have reached an all-time high.

There has been a dramatic increase in the volume of hospital-based care which is provided on a day basis. In 1980, day activity constituted just 2% of all non-outpatient care in hospitals in Ireland. In 2000, 38% of *all* non-outpatient care, exclusive of obstetric care, was provided on a day basis. This demonstrates that day activity is now an important component of hospital activity.

The number of outpatients seen in the acute hospitals is now approximately 2 million per annum. This has increased by 37% since 1980.

Taken together, these data point to an ever-increasing demand for hospital-based care. Hospitals have become increasingly busy with fewer beds and higher total numbers of patients.

## 1.4 Population of Ireland, 1981 to 2000

The population of Ireland changed little between 1981 and 1996, either in size or structure (Table 1.2). The total population increased by less than 200,000 (5%) in the 15-year period. The proportion of children decreased from 30% to 24%. The number of older people (65+ years) increased by 45,000, representing an increase from 10.7% to 11.4% of the total population.

**Table 1.2:** Population of Ireland: Summary Statistics for the Years 1981 to 2000(E)

Age Group	1981*		1986*		1991*		1996*		2000 (E)	
	N	%	N	%	N	%	N	%	N	%
0-14	1,043,729	30.3	1,024,701	28.9	940,574	26.7	859,424	23.7	824,400	22.0
15-64	2,030,722	59.0	2,131,587	60.2	2,182,245	61.9	2,352,781	64.9	2,538,600	67.0
65-74	237,057	6.9	240,494	6.8	240,077	6.8	239,351	6.6	238,600	6.2
75+	131,897	3.8	143,861	4.1	162,823	4.6	174,531	4.8	185,500	4.8
<b>TOTAL</b>	<b>3,443,405</b>	<b>100.0</b>	<b>3,540,643</b>	<b>100.0</b>	<b>3,525,719</b>	<b>100.0</b>	<b>3,626,087</b>	<b>100.0</b>	<b>3,787,100</b>	<b>100.0</b>

\* = Census year

(E) = Estimated

Source: Central Statistics Office, Dublin

By contrast, the population has grown by approximately 161,000 in the last five years. Virtually all this growth has been in the working age groups due to economic prosperity and net immigration. There are fewer children, now 22% of the population. There are approximately 10,200 more people aged 65+ but this group still constitutes just 11% of the total population.

## 1.5 Acute Hospital Beds per Capita, 1981 to 2000

Table 1.3 shows the change in acute hospital beds per 1,000 population from 1981 to 2000. Although the number of acute hospital beds has changed little since 1993, the number per capita in 2000 has fallen to an all time low of 3.1 per 1,000 due to population growth.

**Table 1.3:** Acute Hospital Beds per Capita, 1981 to 2000

Year	Beds	Population	Beds per 1,000
1981	17,668	3,443,405	5.1
1986	16,878	3,540,643	4.8
1991	13,806	3,525,719	3.9
1996	11,937	3,626,087	3.3
2000	11,832	3,787,100 (E)	3.1

(E) = Estimated

The current distribution of acute hospital beds by broad clinical category in 2000 is given in Table 1.4. These data are provided by the hospitals to the DOHC on a monthly basis using the IMR.

**Table 1.4:** Acute Hospital Bed Designations in Ireland, 2000

Clinical Category	IMR Bed Designations	
	N	%
General Medicine	4,590	(39)
General Surgery	4,417	(37)
Obstetrics	1,068	(9)
Paediatrics	1,177	(10)
Acute Psychiatry	580	(5)
<b>TOTAL</b>	<b>11,832</b>	<b>(100)</b>

This is the basis upon which the analysis of future bed requirement, taking account of current activity, and existing and emerging pressures is based.

## 1.6 Admission to Acute Hospitals in Ireland

Admission to an acute hospital may be planned (elective) or may be required as a matter of urgency (emergency). *Elective* admissions are those which occur as a consequence of referral to hospital by a general practitioner or medical consultant, a visit to the hospital outpatient department or a planned transfer from another hospital. Patients who present to, or are referred to, the A&E department and are admitted to hospital following assessment of need, are deemed to be *emergency* admissions.

A total of 1.2 million A&E attendances were recorded in Ireland in 2000. This is an increase of almost 20% from 1.0 million in 1988, the first year for which A&E attendance was reported in Annual Health Statistics. To what can the increasing number of A&E *attendances* be attributed? The following factors almost certainly contribute:

- population growth from approximately 3.4 million in 1980 to approximately 3.8 million in 2000;
- limited availability of 'out of hours' primary care services;
- financial disincentives to use primary care as the first option; and
- societal expectations regarding the ready availability and accessibility of A&E facilities.

Approximately one-quarter of A&E attendees are admitted to hospital. In the context of essentially static bed numbers and increasing A&E attendances, this means that an increasing proportion of acute hospital beds are occupied by patients admitted through A&E. There is no established 'correct' ratio of emergency to elective admissions. Suffice it to say that emergency admissions, by their nature, take precedence over elective admissions.

Explanations for the increasing proportion of inpatient admissions which are deemed to be emergencies include:

- increasing attendances at A&E for the reasons outlined above;
- increasing longevity due to better health care and social circumstances;
- changing age distribution of the population (more older people); and
- changing traditional care structures in society.

### Consequences of current pressures for hospital admission

Increasing pressure to admit emergency patients results in frequent cancellation of planned admissions for elective procedures, deferment or cancellation of elective procedures for patients in hospital and the persistence of waiting lists. It has become increasingly difficult to plan admissions to acute hospitals and to execute those plans. As a consequence, an emerging practice has been to refer patients to A&E who should be admitted electively, but for whom attendance at A&E offers the only prospect of being admitted.

The relentless pressure from A&E for admission has also resulted in bed occupancy levels in many acute hospitals which are unacceptably high. A contributing factor is the number of older patients and patients with chronic conditions admitted through A&E. Many cannot be discharged when their acute care has been completed because of a lack of appropriate facilities for their placement or support. Therefore, acute beds are inappropriately occupied by patients who are medically fit for discharge. Appropriate bed 'turnover' is impeded. Meanwhile, the pressure from A&E to admit needy patients continues. Delays of several hours awaiting admission are common.

In short, current acute hospital bed capacity in Ireland is unable to respond adequately to the demands to which it is subjected. Adding capacity is one potential solution. Examining ways in which current capacity could be used more effectively and efficiently is another. It is unlikely that one solution can be found for such a complex problem. More likely is that a combination of measures will be required.

## SECTION 2

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# International Comparisons of Hospital Bed Capacity



## 2.1 Introduction

This section examines hospital bed complement and average length of stay in Ireland in the context of similar data from other countries. Similar efforts at reviews of bed capacity internationally are outlined.

## 2.2 OECD Comparisons of Hospital Bed Capacity

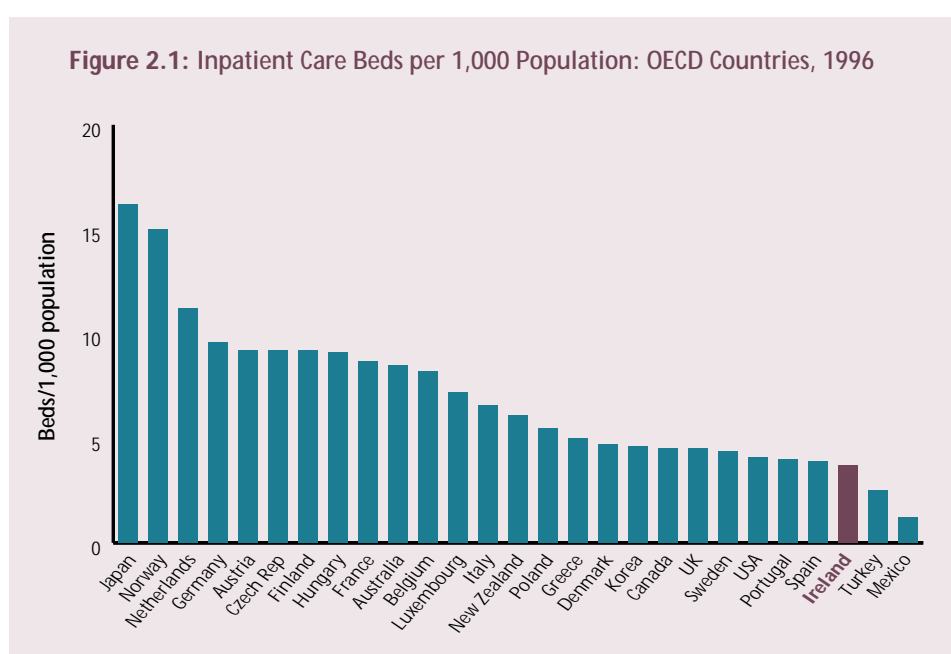
The Organisation for Economic Co-operation and Development (OECD), in an analysis of the Irish Healthcare System (1997), stated that the system *'has resulted in good provision of healthcare at relatively low cost to the taxpayer'*.<sup>18</sup> The report also identified significant improvements in hospital productivity and found that the ALOS in hospital had been reduced by an amount greater than that achieved in other OECD countries. The average bed occupancy is one of the highest in the OECD. In addition, the reduction in the number of hospital beds was much greater than seen in other OECD countries. Ireland, on this basis, has shown remarkable productivity gains in hospitals in comparison to other developed countries.

Some of the above measures of acute hospital infrastructure and activity have been examined in more detail using the *OECD Health Data 2000*.<sup>19</sup> They include inpatient care beds per 1,000 population, acute beds per 1,000 population, ALOS and acute bed occupancy levels.

### Inpatient Care Beds per 1,000 Population

*OECD Definition:* Inpatient care beds are those beds accommodating patients who are formally admitted (or 'hospitalised') to an institution for treatment and/or care and who stay for a minimum of one night in the hospital or other institution providing inpatient care. Inpatient care is delivered in hospitals, other nursing and residential care facilities or in establishments which are classified according to their focus of care under the ambulatory care industry but perform inpatient care as a secondary activity.<sup>19</sup>

Data for 1996, the most recent year for which the majority of OECD countries provided such data, are presented graphically in Figure 2.1. Details of what comprises *inpatient care beds* and the sources of information for each country are given in the *Technical Report*.<sup>see p.14</sup>



Source: OECD Health Data 2000. A Comparative Analysis of 29 Countries. OECD Health Policy Unit, Paris, France

The number of inpatient care beds per capita ranged from 1.2 per 1,000 in Mexico to 16.2 per 1,000 in Japan. The number of inpatient care beds in Ireland is among the lowest in OECD countries and the lowest among EU countries at 3.7 per 1,000. Among EU countries, the Netherlands had the highest per capita number of inpatient beds with 11.2 per 1,000 (1996 data).

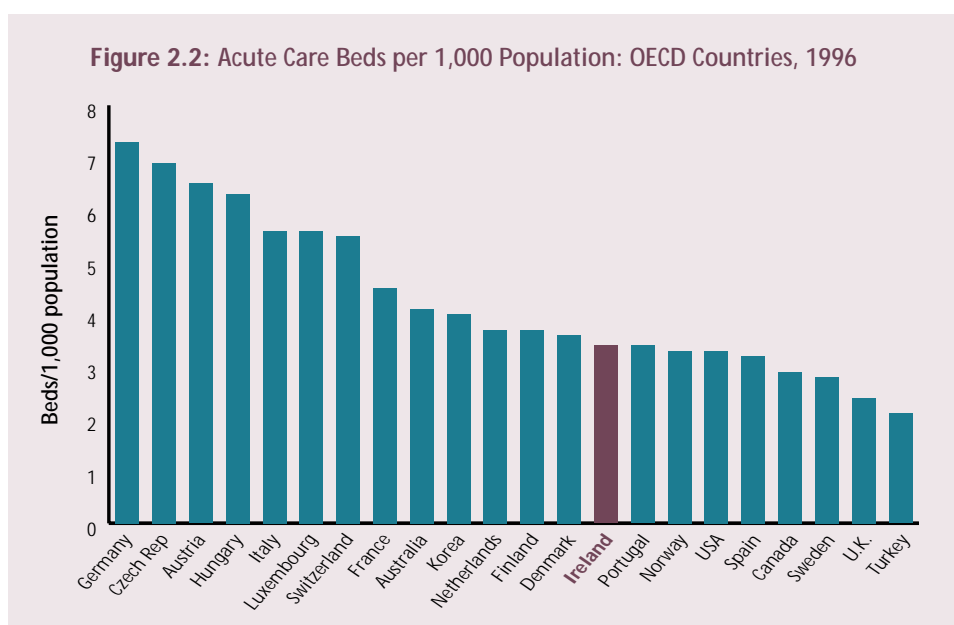
With such a broad range of inpatient beds per capita, it is relevant to examine the type of beds included in this category. All countries include acute care beds. Most countries include psychiatric beds and some countries include long-term care beds. Long-term care beds are not included in the data for Ireland. Other countries which also exclude long-term care beds from the category 'Inpatient Care Beds', are Norway, Germany, Poland, Greece, Denmark, Canada, UK, Portugal, and USA. Even among this group, Ireland still has the lowest per capita number of inpatient beds.

### Acute Care Beds per 1,000 Population

*OECD Definition:* Acute care beds are those beds accommodating patients where the principal clinical intent is to do one or more of the following:<sup>19</sup>

- manage labour (obstetric);
- cure illness or provide definitive treatment of injury;
- perform surgery;
- relieve symptoms of illness or injury (excluding palliative care);
- reduce severity of illness or injury;
- protect against exacerbation and/or complication of an illness and/or injury which could threaten life or normal functions; or
- perform diagnostic or therapeutic procedures.

Data for 1996 are presented graphically in Figure 2.2. Details of what comprises acute care beds and the sources of information for each country are provided in the *Technical Report*.<sup>see p.14</sup>

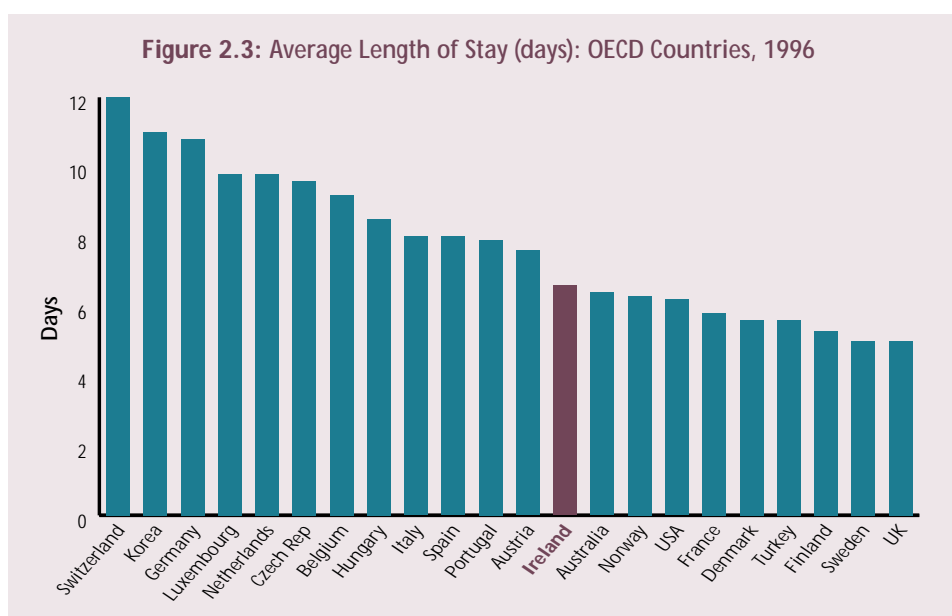


Source: OECD Health Data 2000. A Comparative Analysis of 29 Countries. OECD Health Policy Unit, Paris, France

The number of acute care beds ranged from 2.1 per 1,000 in Turkey to 7.3 per 1,000 in Germany. The number of acute care beds in Ireland (3.4 per 1,000; 1996 data) is 14th of 22 OECD countries and 9th of 13 EU countries for which data are available. In general, acute care beds do not include psychiatric or long-term care beds. Beds in private hospitals in Ireland are not included.

### Average Length of Stay

*OECD Definition:* Average length of stay is computed by dividing the number of days stayed (from the date of admission in an inpatient institution) by the number of discharges + deaths during the year. Data for 1996 are presented graphically in Figure 2.3.



Source: OECD Health Data, 2000. A Comparative Analysis of 29 Countries. OECD Health Policy Unit, Paris, France

Of 22 countries for which data are available, Ireland lies in 13th position with ALOS of 6.6 days.

### Commentary

The OECD data would suggest that the number of inpatient care beds in Ireland is inadequate when compared with levels in EU and other developed countries, even allowing for the fact that long-term care beds are not included in the Irish data. Data for nine other countries are also presented exclusive of long-term care beds; all of them have higher per capita number of inpatient care beds than Ireland. The number of acute care beds in Ireland is towards the middle to lower part of the OECD range. Countries such as Portugal, Norway, USA, Spain, Canada and the UK have a larger stock of inpatient beds which are not classified as acute care beds and which potentially alleviate the pressure on acute beds. Other characteristics of health systems with a low acute bed utilisation rate, such as USA, include the existence of a large range of ambulatory and intermediate care facilities and active management of hospital utilisation.<sup>20</sup> These are not yet as developed in the Irish healthcare system. As outlined in the OECD Review 1997, on objective criteria such as reduction in acute bed numbers and reduction in ALOS, the productivity of the Irish hospital system is deemed to be high and to have exceeded that in OECD countries.<sup>18</sup> However, it is reasonable to suggest that such productivity on objective criteria is now interfering with service delivery as previously outlined.

## 2.3 Other International Reviews of Bed Capacity

Concerns about the adequacy of existing acute hospital bed capacity are not unique to Ireland. Within the recent past a National Beds Inquiry was undertaken in the UK.<sup>20, 21</sup> It reviewed historical trends in acute health services, examined local and international variations in services and trends, assessed the key drivers of future service requirements, reviewed different models of care and explored a range of projections of future activity.

The length of hospital waiting lists and the recurrence of winter pressures on emergency beds suggested that present hospital services were not well matched to patient needs. At the same time, there was continuing evidence of inappropriate and avoidable use of hospital beds. The key drivers of future service requirements examined included demographic changes, technological advances in healthcare, and their impact on changes in clinical practice, the behaviour of increasingly well-informed customers and carers, i.e. demand, and cost-effectiveness of alternative forms of care. Of all of these, the current use of hospital beds by older patients was seen as the most important predictor of future hospital bed requirement. In the UK, persons aged 65+ constitute 16% of the population and occupy almost two-thirds of general and acute hospitals beds, accounting for over half the recent growth in emergency admissions.<sup>21</sup> A review of acute hospitals carried out in Northern Ireland identified similar drivers of need for hospital services.<sup>22</sup> Commentaries on the National Beds Inquiry identified that the fact that bed capacity had not kept pace with need and suggested that the reductions in bed stock had “gone too far”.<sup>23, 24</sup>

In the USA, after a period of excess capacity in the 1990s, hospitals are now experiencing significant difficulties in meeting inpatient demand. Occupancy rates have increased from 50% to 85% and above. A study of approximately 3,000 acute hospitals nationwide, carried out by the Healthcare Advisory Board, has identified increased demand for health services, population changes and fixed bed capacity as the reasons for increased occupancy rates.<sup>25</sup>



## SECTION 3

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# Trends in Acute Hospital Activity 1995 to 2000

### 3.1 Introduction

This section analyses the trends in acute hospital activity in Ireland from 1995 to 2000 inclusive. The analysis is based on data recorded in the national HIPE database collated by the Economic and Social Research Institute (ESRI) on behalf of the DOHC. Specific attention is given to changes in the relative distributions of medical and surgical patients and the impact this has on current hospital activity.

### 3.2 Methodology

#### The HIPE Database

The HIPE database is a computer-based information system designed to record completed episodes of care in acute hospitals in Ireland. Thus it records discharges rather than admissions. HIPE data are collated in all acute hospitals in the country, including maternity and paediatric hospitals. While there were concerns about the quality of HIPE data in the early years of the database, they are regarded as being virtually complete for the acute hospitals since 1995. The maternity hospitals entered the HIPE system later, however, and it is estimated that full coverage of obstetric activity was not accomplished until 1999 (ESRI, personal communication). For this reason data on trends in acute hospital activity between 1995 and 2000 are presented excluding obstetric data.

The HIPE database comprises demographic, administrative and clinical data on inpatients and day cases in acute hospitals. It does not include outpatient data. Clinical data, extracted from relevant clinical records for that admission, are coded according to the International Classification of Disease (ICD) System.<sup>26</sup> Details of the data items recorded in the HIPE database are available in the *Technical Report*.<sup>see p.14</sup> Of relevance to this Review is the ability to identify hospital patients as inpatients or day cases, emergency or elective admissions, public or private patients, and to analyse their age, length of stay in hospital and principal diagnoses and/or procedures from the HIPE data.

The *strengths* of the HIPE database include the following:

- it provides the basis for analysis of hospital activity on a national basis;
- the completeness and accuracy of data are high. It is estimated that 98% of acute hospital activity is now reported to the national HIPE database annually (Information Management Unit (IMU), DOHC, personal communication);
- clinical activity data can be produced by Diagnosis Related Group (DRG) and by Major Diagnostic Category (MDC).

*Limitations* of the HIPE database include the following:

- data are essentially confined to acute publicly-funded hospitals. There are no data from most private hospitals or from convalescent or nursing homes;
- entries are based on episodes of care rather than individual patients; thus a patient who has been admitted repeatedly will be represented several times in the database.

#### Data Analysis

HIPE data for each year 1995 through 2000 were analysed using SAS.<sup>27</sup> Patients were identified as inpatients or day cases based on source of admission, duration of stay and destination on discharge. Inpatients were deemed to be *emergency* or *elective* based on source of admission. *Emergency* patients are inpatients; *elective* patients may be inpatients or day cases.

Patients were divided into two distinct clinical categories, 'medical' or 'surgical', based on ICD-coded diagnostic and procedural data, the rationale being that, while all patients are unique, groups of patients have demographic, diagnostic and therapeutic attributes in common which determine to some degree their level of resource requirement. 'Surgical' patients are defined by the procedure which has been performed which in turn distinguishes them from 'medical' patients.<sup>28</sup> (*Technical Report*<sup>see p.14</sup>).

## Presentation of Results

The following parameters of clinical activity are presented:

- A&E attendances;
- the proportion of A&E attendees admitted to hospital;
- total admissions (i.e. inpatients and day cases);
- inpatients discharged;
- emergency and elective inpatients discharged;
- inpatient bed days used;
- average length of stay;
- day cases treated;
- the proportion of *all* patients and of *elective* patients treated as day cases; and
- outpatient attendances.

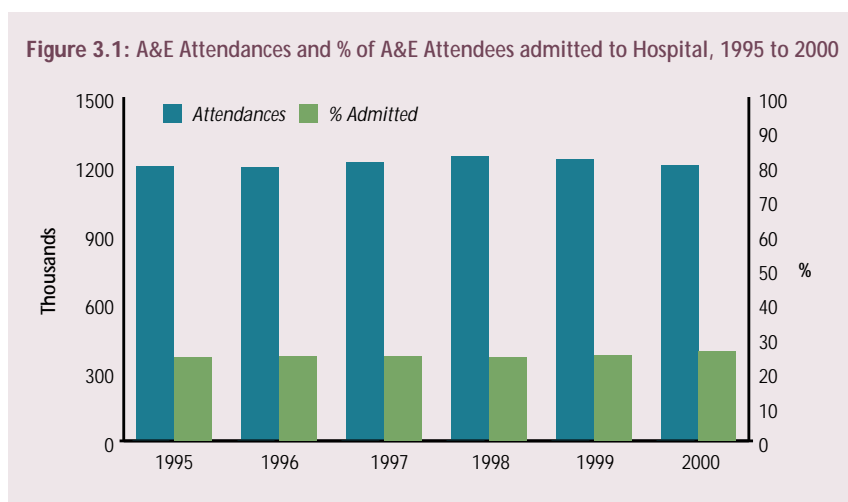
Results are presented graphically. All data upon which Figures are based are provided in Appendix I. Numbers of patients/attendances and rates per 1,000 population are presented for each year, 1995 through 2000, to identify recent trends in hospital activity. Rates per 1,000 were estimated using specific CSO population estimations for each year. These data are provided in the *Technical Report*.<sup>see p.14</sup> Reporting both numbers and rates per 1,000 is of value. The former indicates the service load for acute hospitals, while the latter measures change in activity, 'corrected' for change in population size.



### 3.3 Patients Treated in Acute Hospitals

#### A&E Department Activity, 1995 to 2000

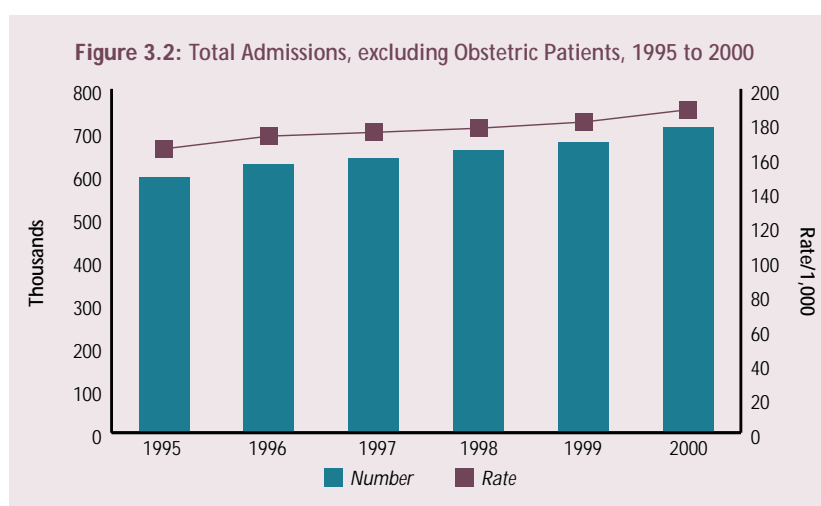
A&E activity is reported by hospitals as number of attendances. The proportion of A&E attendees admitted was computed from emergency admission data in the HIPE database.



In 1995 there were 1,199,452 A&E attendances in Ireland. The number increased by 2.5% to 1,229,303 between 1995 and 1999 (data for 2000 are provisional at this time). The proportion of A&E attendees admitted to hospital has been quite consistent between 1995 and 1999 at approximately 25%.

#### Total Admissions, 1995 to 2000

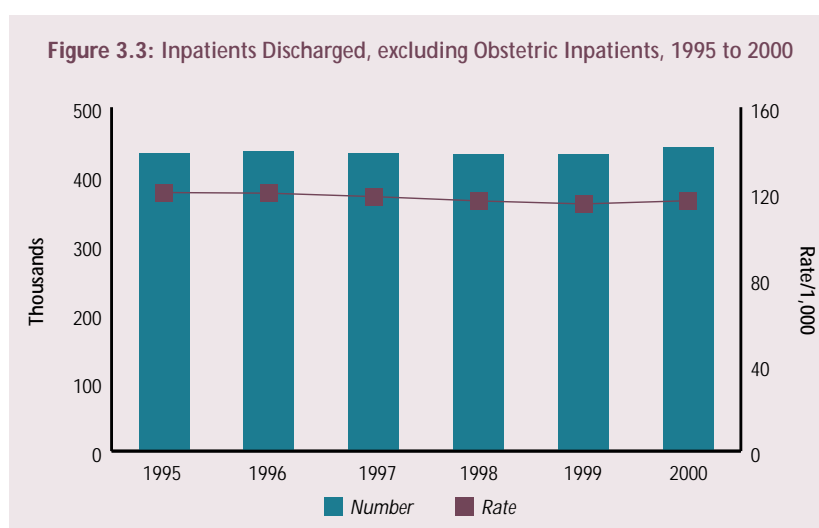
Included in this category are all patients (inpatients and day cases) admitted to acute hospitals.



In 1995 there were 594,620 admissions to acute hospitals, excluding obstetric admissions. The total *number* of admissions to acute hospitals increased by 20% to 711,694 between 1995 and 2000. There was a 14% increase in the *rate* of admissions per 1,000 population between 1995 and 2000.

## Inpatients Discharged, 1995 to 2000

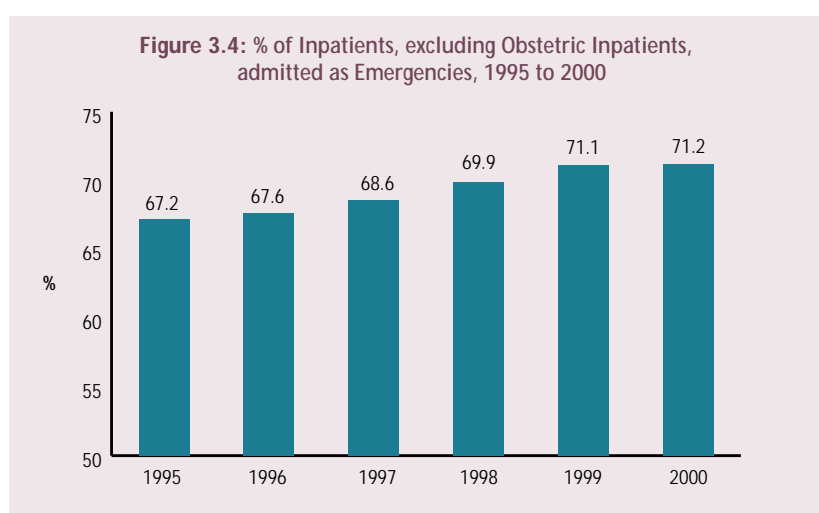
Total admissions may be separated into inpatient admissions and day cases. Inpatients refer to those patients who are admitted to hospital, either electively or as an emergency, and who require the use of a hospital bed overnight.



The *number* of inpatients discharged increased by 2% between 1995 and 2000. However, the inpatient *rate* per 1,000 population decreased by 3% due to population growth. This indicates that, although the number of inpatients increased, the per capita availability of inpatient services was reduced. Thus hospital inpatient capacity has not kept pace with population growth over the last five years.

## Emergency Admissions, 1995 to 2000

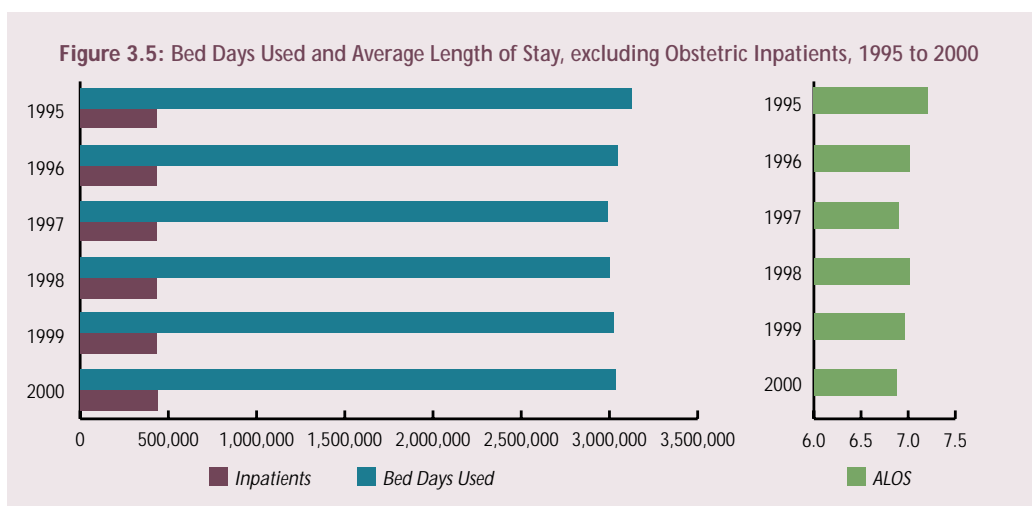
Hospital admission may be planned (elective) or required as a matter of urgency (emergency). The proportion of inpatient admissions which are emergency has a significant bearing on the scope for elective treatment. Figure 3.4 shows the proportions of inpatients admitted as emergencies from 1995 to 2000.



Inpatients admitted through A&E increased from 291,121 (67.2%) in 1995 to 314,241 (71.2%) in 2000. This represents an overall increase of 8%, or an average annual increase of 1.6%.

### Bed Days Used and Average Length of Stay, 1995 to 2000

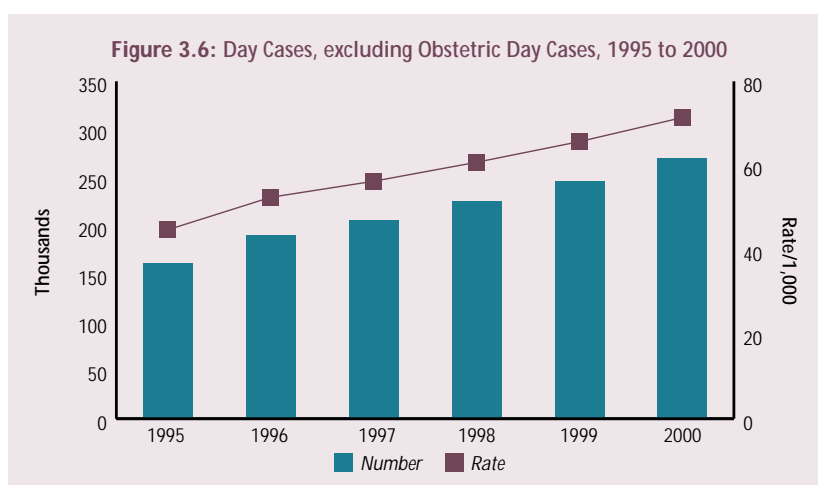
A measure of the burden of care incurred by inpatients is the number of bed days used in the course of their hospital stay. Bed days are computed from length of stay data for each inpatient. ALOS is computed from total number of bed days divided by total inpatients.



The *number* of bed days used decreased by 3% between 1995 and 2000, related to a small reduction in bed numbers (see Table 1.1) and bed closures. It is notable that, despite fewer bed days available for these reasons, more inpatients were treated and ALOS actually decreased slightly over this period. Average lengths of stay decreased from 7.2 to 6.9 days over the period.

### Day Cases, 1995 to 2000

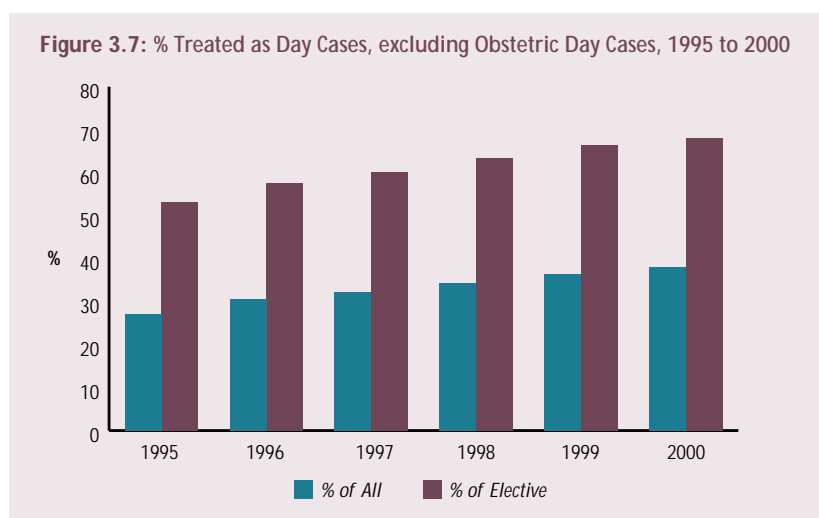
Day cases refer to those patients who are admitted to hospital for care and/or treatment which can take place on a day basis, who do not require the use of a hospital bed overnight and who are discharged as planned.



The *number* of day cases increased by 68% between 1995 and 2000 from 161,404 to 270,577, an average annual increase of 13.5%. The *rate* of day activity per 1,000 population increased by 60% over the period.

# Proportion of *All* Patients and *Elective* Patients treated as Day Cases, 1995 to 2000

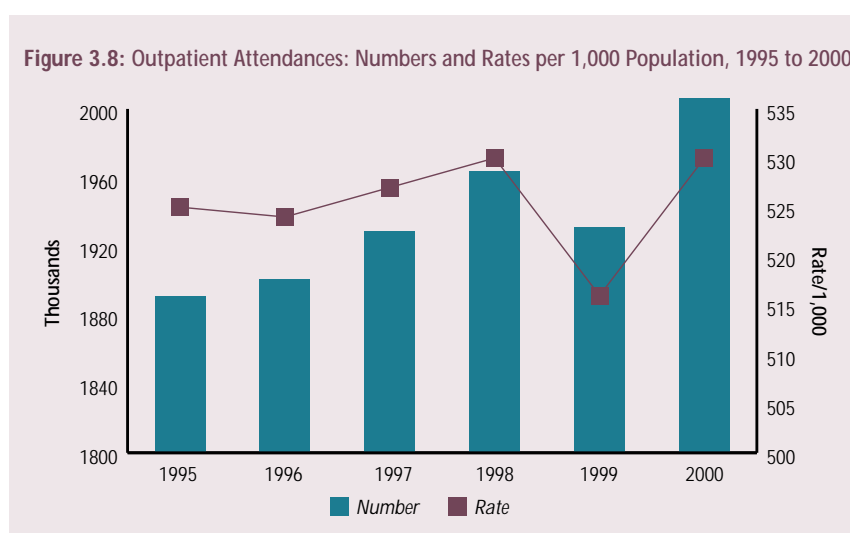
An important indicator of the changing profile of hospital practice is the proportion of patients treated on a day basis. In reporting this figure it is important to distinguish between two possible denominators, i.e. of *all* patients treated or of *elective* patients treated.



The proportion of *all* patients treated on a day basis in 2000 was 38%. This had increased steadily from 27% in 1995. The proportion of *elective* patients treated on a day basis in 2000 was 68%. This had increased from 53% in 1995.

# Outpatient Attendances, 1995 to 2000

Data on outpatients are recorded as number of attendances at consultant-controlled outpatient clinics.



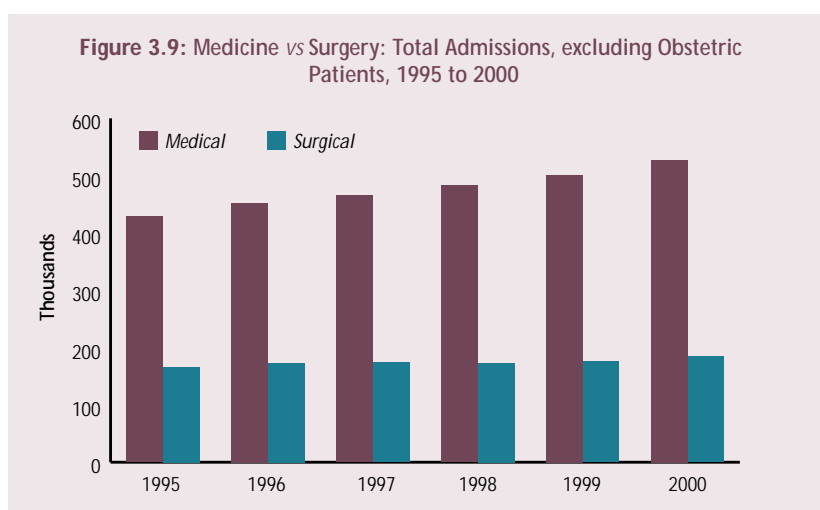
The *number* of outpatient attendances increased by 6% between 1995 and 2000, except for a dip in 1999, most likely related to the nurses' strike during which outpatient clinics were cancelled. This is an average annual increase of 1.2%.

### 3.4 Medicine vs Surgery: The Evolving Relationship

Examining trends in hospital activity would be incomplete without some analysis of activity by broad clinical category. An increasingly important basis for activity analysis is whether patients are 'medical' or 'surgical'. At an operational level, services in acute hospitals are organised along medical and surgical lines, consultant clinical staff are appointed as physicians or surgeons and facilities required by medical and surgical specialties differ. Patient volumes, bed day use and activity levels also differ between medical and surgical specialties. The relationship between medical and surgical specialties is in a continuous state of flux as diagnostic and treatment technologies and possibilities continue to evolve.

#### Medicine vs Surgery: Total Admissions, 1995 to 2000

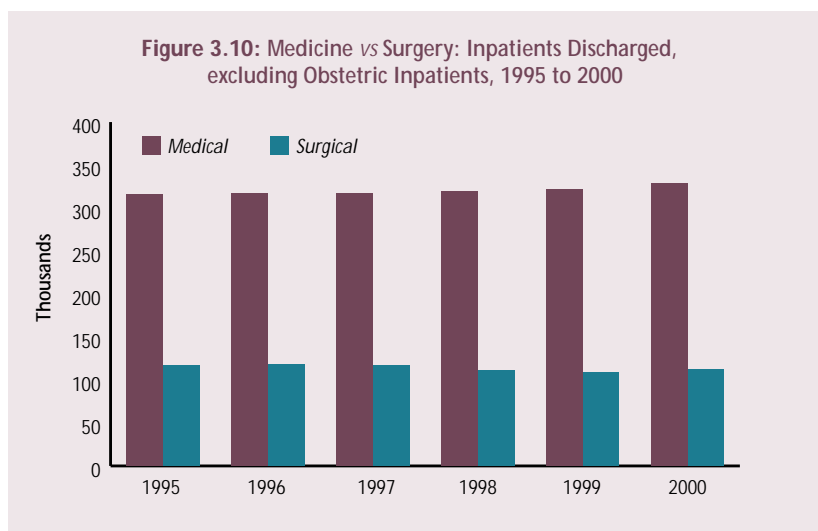
Analysis by clinical category of the data presented in Figure 3.2 for total admissions (i.e. inpatient and day cases) are presented in Figure 3.9.



Almost three-quarters of all admissions to the acute hospitals are 'medical' admissions. The total number of admissions to acute hospitals increased by 20% between 1995 and 2000 (Figure 3.2). The increase was greater for 'medical' patients (23%) than for 'surgical' patients (11%). As a consequence the proportion of all admissions which are 'medical' has increased from 72% in 1995 to 74% in 2000.

### Medicine vs Surgery: Medical and Surgical Inpatients Discharged, 1995 to 2000

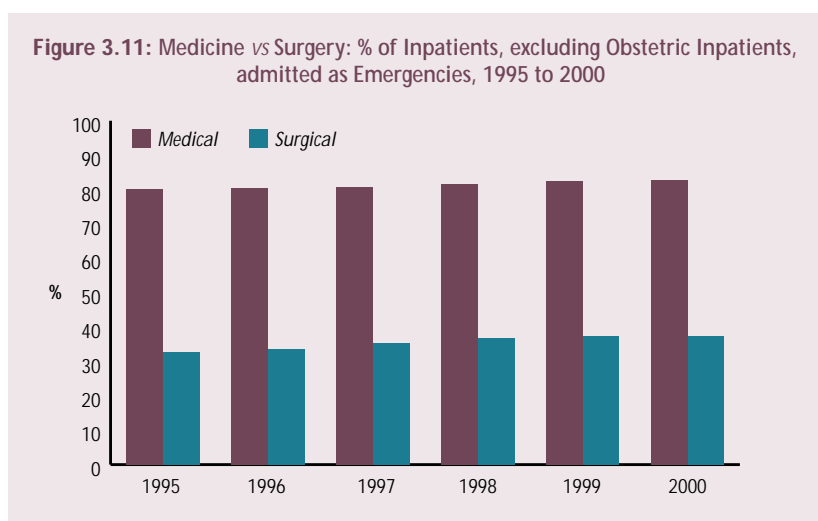
Further analysis of the data provided in Figure 3.3 on Inpatients Discharged is provided in Figure 3.10.



Almost three-quarters of inpatients discharged are 'medical', the proportion having increased from 72.9% in 1995 to 74.5% in 2000. Of particular note in relation to inpatients discharged is that the number of medical inpatients discharged *increased* by 4.1%, while the number of surgical inpatients *decreased* by 4.1% between 1995 and 2000.

### Medicine vs Surgery: Emergency Admissions, 1995 to 2000

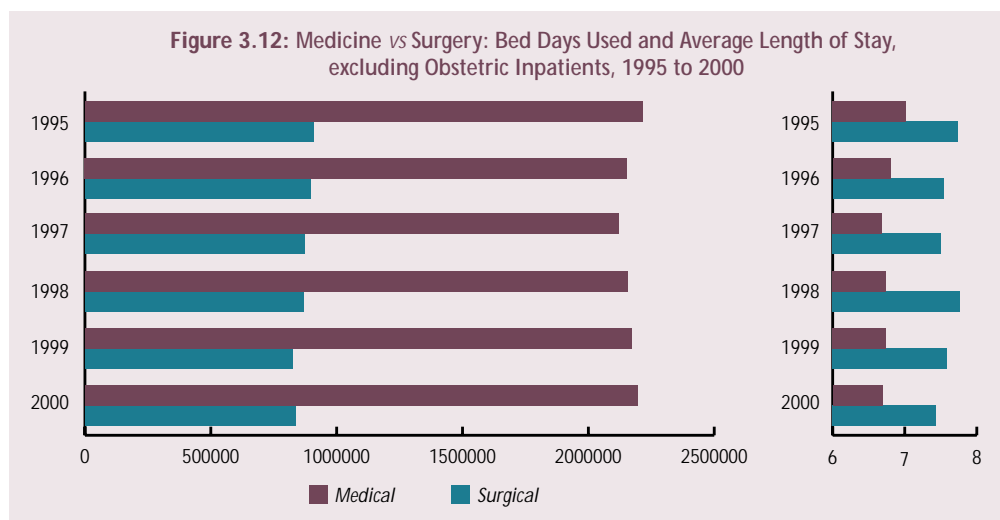
Further analysis of data presented in Figure 3.4 are presented in Figure 3.11.



Of medical inpatients, over 80% are admitted through A&E compared with approximately one-third of surgical inpatients. The proportions of both have increased between 1995 and 2000.

### Medicine vs Surgery: Bed Days Used and ALOS, 1995 to 2000

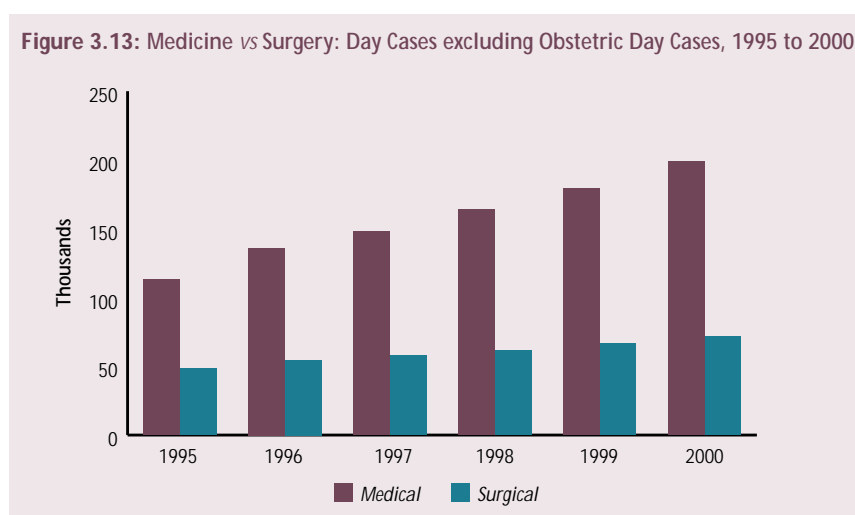
Data provided in Figure 3.5 are examined by clinical category in Figure 3.12.



The overall reduction in bed days used from 1995 to 2000 was 3%. This obscures the fact that there was a significant difference between 'medical' and 'surgical' patients. The reduction in the numbers of bed days used by 'medical' patients was negligible (less than 1%) while the numbers of bed days used by 'surgical' patients decreased by 8% over the period. Although ALOS decreased over the period for both medical and surgical patients, ALOS for surgical patients was higher in each year than for medical patients. Almost three-quarters of all bed days are taken up by medical patients.

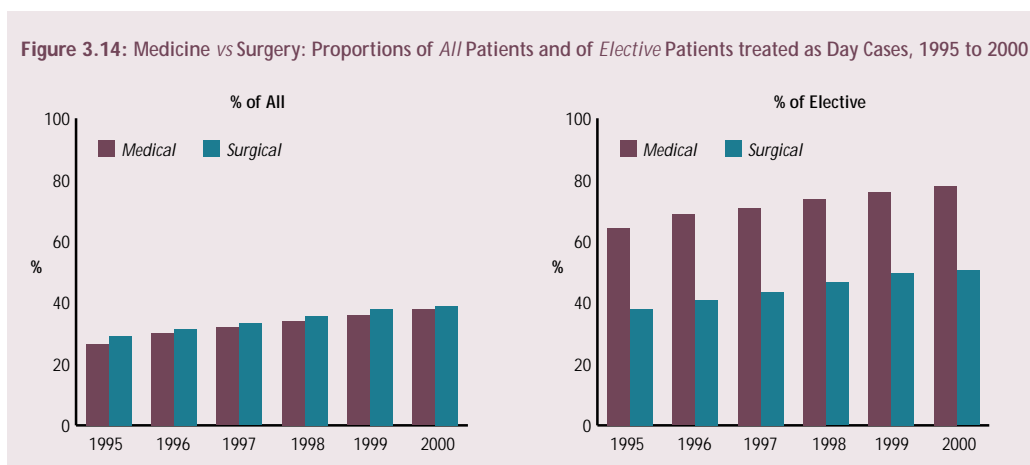
### Medicine vs Surgery: Day Cases, 1995 to 2000

Further analysis of data presented in Figure 3.6 are presented in Figure 3.13.



The overall number of day cases increased by 68% between 1995 and 2000. This was due to a 76% increase in 'medical' day cases and a 48% increase in 'surgical' day cases.

Figure 3.14 examines the proportion of *all* medical and surgical patients and the proportion of *elective* medical and surgical patients treated on a day basis.



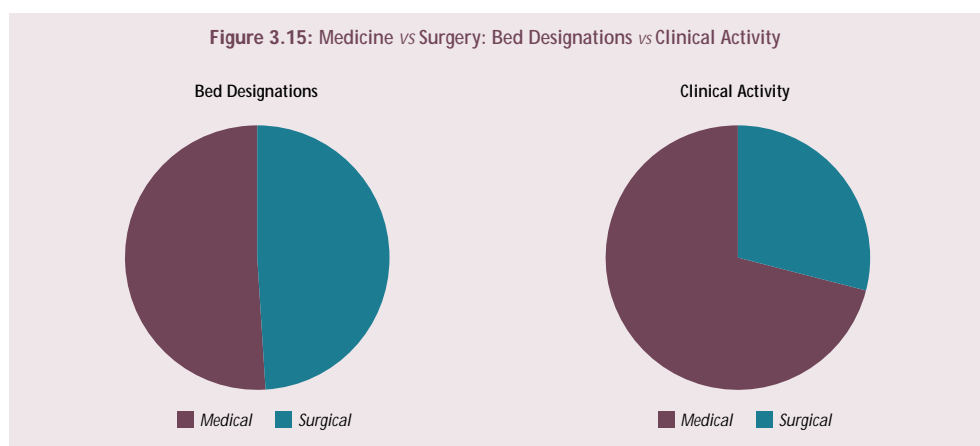
The proportions of *all* medical and *all* surgical patients treated on a day basis increased gradually from 1995 to 2000 (25% to 38% of *all* medical patients; 29% to 39% of *all* surgical patients).

The proportions of *elective* medical and *elective* surgical patients treated on a day basis also increased from 1995 to 2000 (64% to 78% of *elective* medical patients; 38% to 50% of *elective* surgical patients), but were significantly different from each other each year. This is due to the fact that over 80% of medical inpatients are emergency admissions. Thus 'medical' day cases account for a very high proportion of *elective* medical activity. It is of note, however, that the increase in 'medical' day activity was significantly higher at 70% than the increase in 'surgical' day activity (48%). This points to a potential area for further increases in day activity which will be analysed in Section 7.

### Medicine vs Surgery: Bed Designations vs Clinical Activity

Designation of beds to clinical categories and specialties takes place within hospitals. Bed designations by specialty are reported monthly and annually to DOHC along with clinical activity data.

From the data reported by hospitals, beds designated to 'medical' and 'surgical' specialties were collated (detail provided in the *Technical Report* <sup>see p.14</sup>). For the purposes of this exercise only those beds designated for use by medical and surgical patients are examined. From HIPE data, bed days used by 'medical' and 'surgical' patients, defined as previously outlined, were collated. Bed days used by children (0-14), obstetric patients and acute psychiatric patients were excluded.



What is clear from this comparison is that current utilisation of 'medical' and 'surgical' beds is out of step with current bed designations. It confirms the anecdotal evidence of encroachment by medical patients on surgical beds in situations of fixed bed capacity. Given the high proportion of medical inpatients admitted as emergencies (82%), elective surgical patients are being cancelled to make space for emergency medical patients.



### 3.5 Summary

Points of note in relation to changes in total acute hospital activity from 1995 to 2000 are as follows:

- The number of attendances at A&E departments increased by 2.5%. Approximately 25% of A&E attendees are admitted to hospital.
- Total admissions (inpatients and day cases) increased by 20%, an average annual increase of approximately 3.9%.
- The number of inpatients discharged increased by 2%.
- The proportion of inpatients admitted as emergencies increased from 67% to 72%.
- The number of bed days used decreased by 3% related to a small reduction in bed numbers and bed closures. It is notable, however, that the number of inpatients treated actually increased and ALOS decreased from 7.2 to 6.9 days.
- There was a marked increase in day activity. Numbers increased by 68%, an average annual increase of 13.5%.
- Day activity now accounts for 38% of *all* non-outpatient activity and 68% of *elective* activity. This points to the increasing importance of day work in catering for the health needs of the population.
- The number of outpatient attendances increased by 1.2% per annum to 2000.

The increase in total admissions, driven predominantly by the dramatic increase in day activity, is far in excess of any increase that might be expected due to the increase in the size of the population. The fact that the increase in inpatient activity is small (rates per 1,000 actually decreased) is a reflection of the fact that inpatient facilities, beds, staff and other resources, have not kept pace with the population growth. This is further supported by the apparent diversion of a considerable body of work to day facilities and the continuation of waiting lists for elective procedures.

Points of note in relation to Medical and Surgical activity from 1995 to 2000 are as follows:

- Medical patients account for almost three-quarters of all patients treated and inpatient bed days used in acute hospitals. The proportion has increased from 72% to 74% over the period.
- The increase in total admissions (i.e. inpatients plus day cases) was more marked for medical admissions (23%) than for surgical admissions (11%).
- The number of medical inpatients increased by 4.1%. This was matched by a concomitant decrease in surgical admissions.
- The proportion of medical inpatients admitted as emergencies is high and increasing (80% to 82.8%). The proportion of surgical inpatients admitted as emergencies is much lower and ranged from 32.6% to 37.4% over the period reviewed.
- The reduction in bed days used (3% overall) was borne almost entirely by surgical patients. Bed days used by medical patients decreased by less than 1% compared with an 8% decrease in bed days used by surgical patients
- The increase in day activity (68% overall) was accounted for by a 75% increase in medical day activity and a 48% increase in surgical day activity. The proportion of *elective* medical work carried out on a day basis is very high at 78%. Approximately 50% of *elective* surgical work is done on a day basis.

- There is now a marked discrepancy between the proportions of acute hospital beds which are designated as 'medical' and 'surgical' and activity in those clinical categories, as evidenced by bed day use. The discrepancies almost certainly relate to the high proportion of medical inpatients admitted as emergencies and the preponderance of older patients among those emergency medical admissions. These data support the documented reduction in elective surgical admissions and the use of surgical facilities by medical patients.

Ireland is not unique in the experience of the preponderance of medical patients admitted predominantly through A&E departments. The emerging experience in the USA is identical. The Health Care Advisory Board has stated that: "Over time it is reasonable to assume that medical admissions will dominate care delivery at most hospitals". In its study the HCAB also points out that "hospitals looking to increase procedure volumes must first add enough beds to accommodate increasing medical demand. Additional inpatient beds intended for surgery-only patients are sure to be filled by any medical overflow first. In the long run there is no way that hospitals can continue to subsidise 'medical' care. The largest challenge for hospitals and the healthcare system as a whole will be in developing alternative, less costly models for treating chronic medical conditions".<sup>25</sup>



## SECTION 4

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# Age-specific Acute Hospital Activity 2000

## 4.1 Introduction

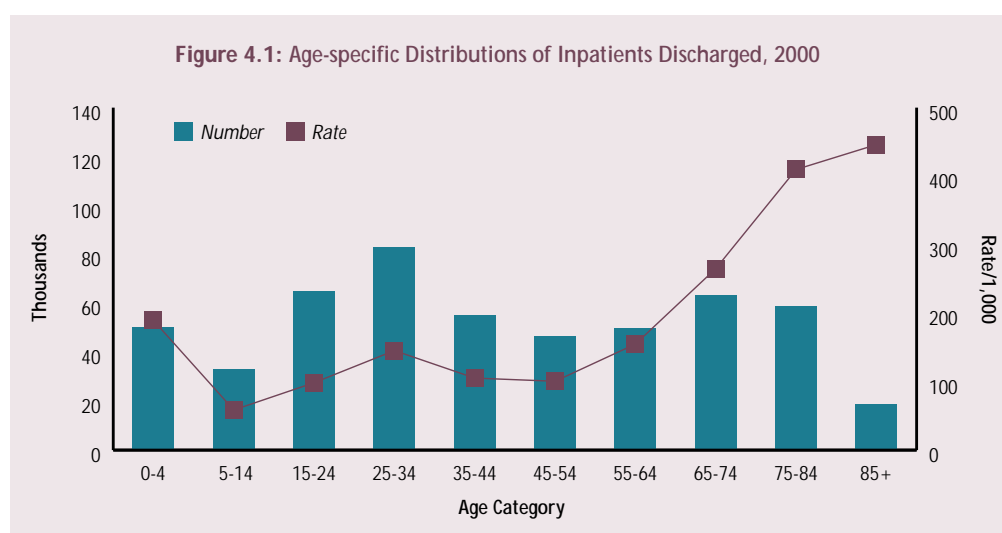
This section analyses the age-specific profile of acute hospital activity in 2000 to identify utilisation patterns by age. This is key to the estimation of future need incurred by projected demographic changes. The analysis is based on data recorded in the national HIPE database collated by the ESRI on behalf of the DOHC.

## 4.2 The HIPE database

A general description of the HIPE database was provided in Section 3.2. Specific to this section is the fact that obstetric activity data are included in the analysis and presentation of results. By 2000 they were fully reflected in the HIPE database, and estimates of future bed requirements should also include maternity beds. HIPE data were broken down by age category for this analysis. The analysis of inpatients and day cases, emergency and elective admission, and medical and surgical patients were as outlined in Section 3.2.

## 4.3 Age-specific Acute Hospital Activity, 2000

### Age-specific Distributions of Inpatients Discharged, 2000

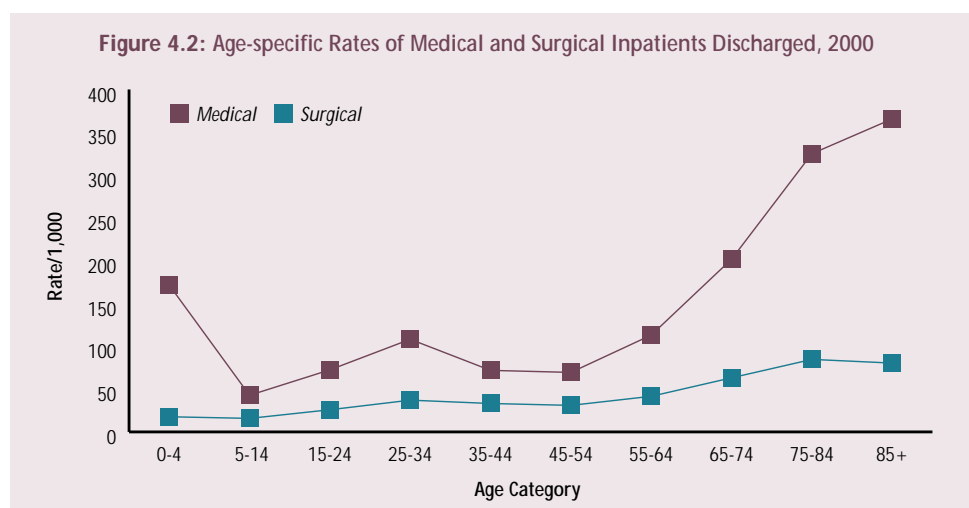


The age-specific distribution of inpatient *numbers* shows that 16% were children, 57% were aged 15-64 years and 27% were aged 65+. The peaks in the 15-24 and 25-34 year age categories are primarily due to obstetric activity.

Inpatient *rates* per 1,000 population are strongly age-related, as evidenced by the increasing age-specific rates with advancing age. This is a factor of particular significance in view of projected demographic changes for Ireland in the coming decades.

## Age-specific Distributions of Medical and Surgical Inpatients Discharged, 2000

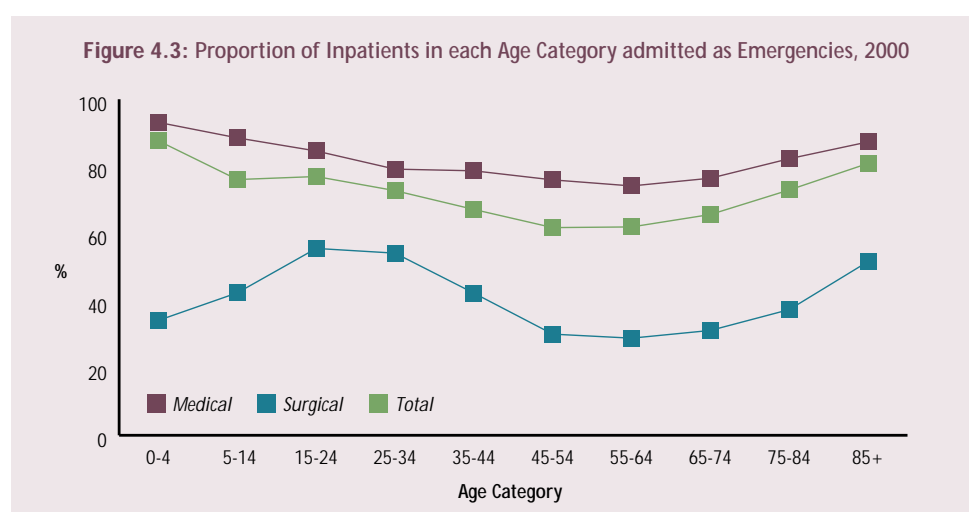
Section 3.4 outlined in detail the relationship between medical and surgical admissions. It is also of relevance to examine the age-specific distributions of medical and surgical inpatients separately (Figure 4.2).



The age-specific rates of hospitalisation increase as would be expected with advancing age for both medical and surgical patients. What is notable, however, is the significantly higher age-specific rates for medical conditions particularly in all age groups above 65 years. The age-specific rate of admission for a medical condition among those aged 65+ is approximately four times higher than the equivalent rate for a surgical condition. These data clearly demonstrate the contribution of medical conditions among elderly patients to the need for admission to hospital.

## Emergency Admissions by Age Category, 2000, Medical, Surgical and Total Patients

The proportion of all inpatients admitted as emergencies in 2000 was approximately 71% (Figure 3.4). Figure 4.3 gives the proportions of inpatients in each age group admitted as emergencies. Data are presented for all inpatients and separately for 'medical' and 'surgical' inpatients.

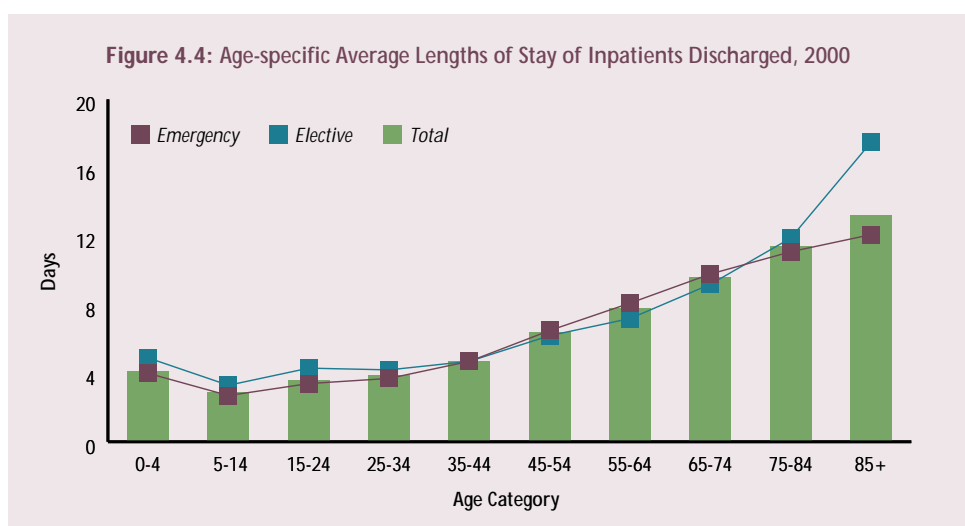


The proportion of all inpatients admitted as emergencies essentially follows a u-shaped curve. It ranges from 87.6% in the 0-4 age group, to 61.8% in the 45-54 age group and 80.9% in the 85+ age group. The proportion of *medical* patients admitted as emergencies by age group shows the same basic structure. At the extremes of life, 93.1% and 87.3% of patients, respectively, were admitted as emergencies.

The lowest proportion was in the 55-64 age group (74.2%). The proportion of *surgical* patients admitted as emergencies peaks in the 15-24 age group, is lowest in the 55-64 age group and rises again towards the end of life. However, at all times, except in the 15-34 age groups, the ratio of medical to surgical emergency admissions is more than 2:1.

### Age-specific ALOS of Inpatients, 2000

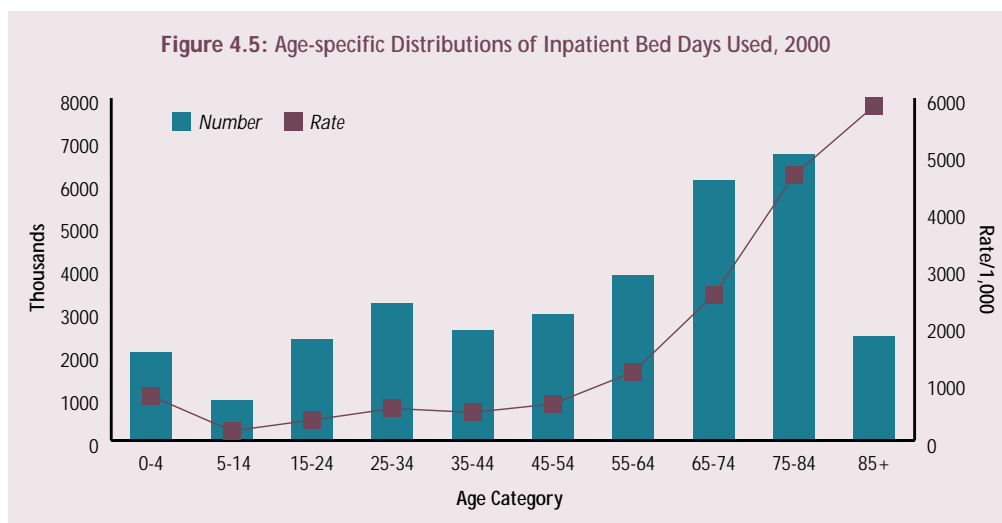
Overall ALOS for all inpatients, including obstetric inpatients, in 2000 was 6.35 days. Figure 4.4 demonstrates the variation in ALOS by age category.



ALOS is strongly age related. ALOS among those aged 65+ is three times higher than among children (0-14) and four times higher than among adults aged 15-64. ALOS of emergency and elective inpatients are presented separately. At younger ages, emergency patients have a slightly shorter ALOS. In the middle years, ALOS of emergency patients is longer and above 75 years emergency patients have shorter ALOS.

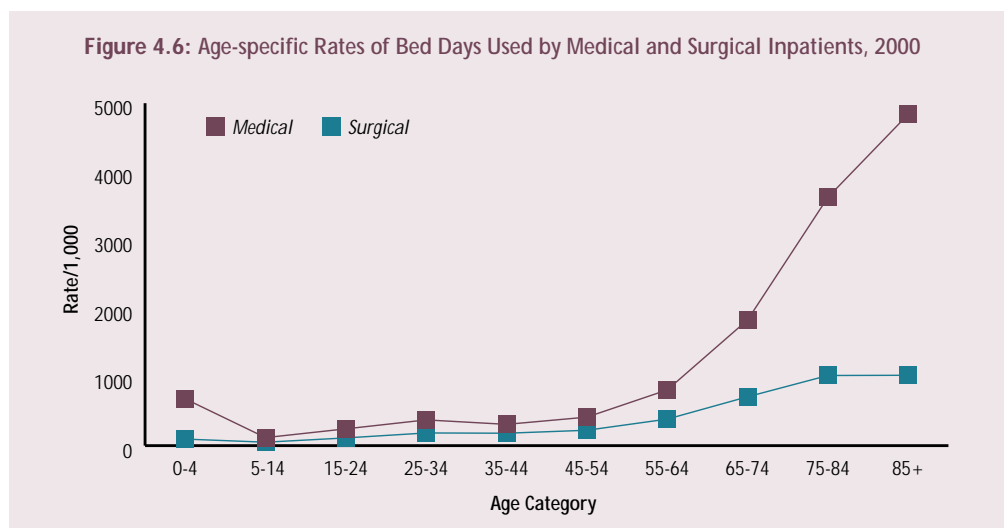
### Age-specific Distributions of Inpatient Bed Days Used, 2000

Inpatient bed days used by patients at different ages are an indication of the burden of care at different ages.

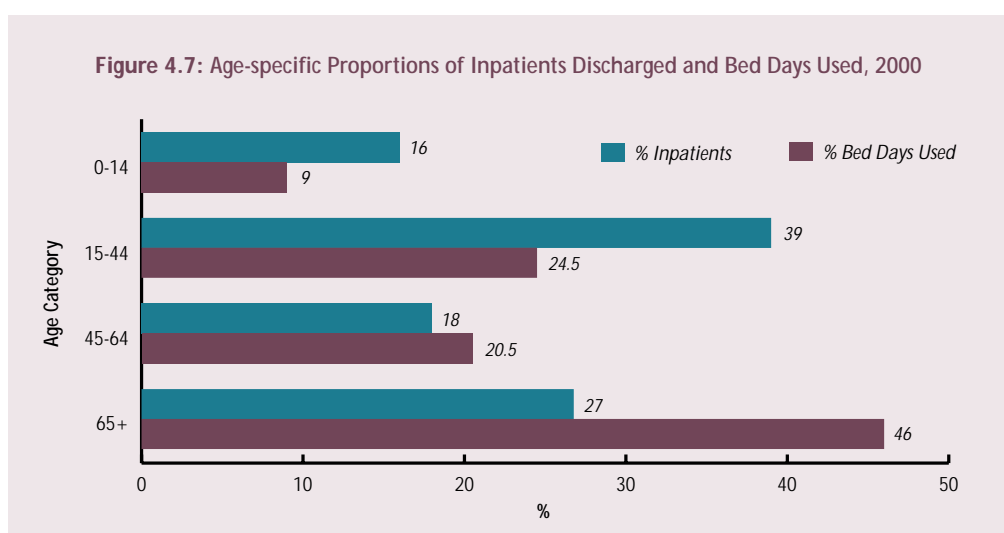


The age-specific rates of bed day used show a dramatic increase with advancing age in line with expectations.

As with inpatient data, shown in Figures 4.1 and 4.2, bed day use by medical patients is higher at all ages than bed day use by surgical patients, but shows marked divergence in older age groups.



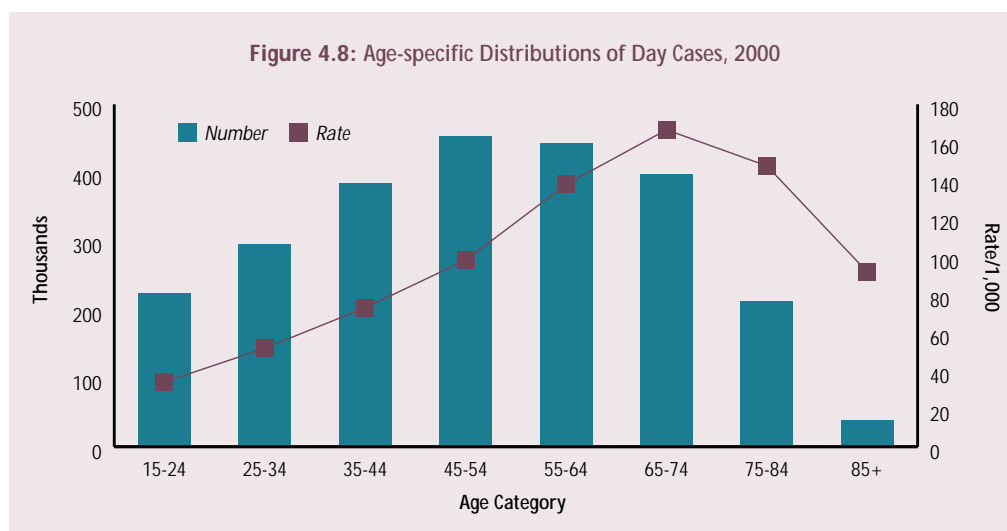
Medical patients consumed 73% of the bed days used. Medical patients aged 75+ consumed 80% of the bed days used by all patients aged 75+.



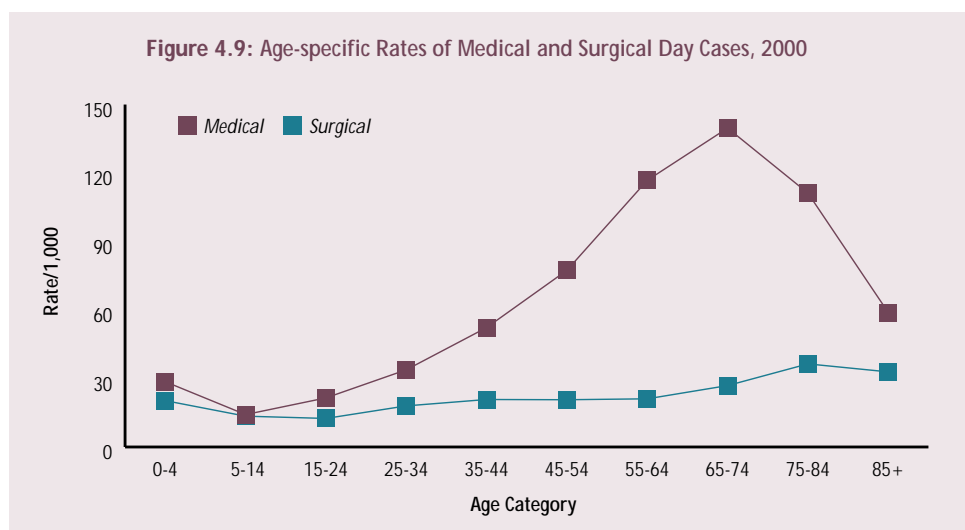
The rate of bed day use in patients aged 65-74 and 75+ is significantly out of keeping with their proportions either in the general population or in the inpatient population. Children, who constitute 22% of the national population, comprise 16% of the inpatient population and required 9% of the bed days used. Persons aged 65+, who constitute 11% of the national population and 27% of the inpatient population, consumed 46% of the bed days used.



## Age-specific Distributions of Day Cases, 2000

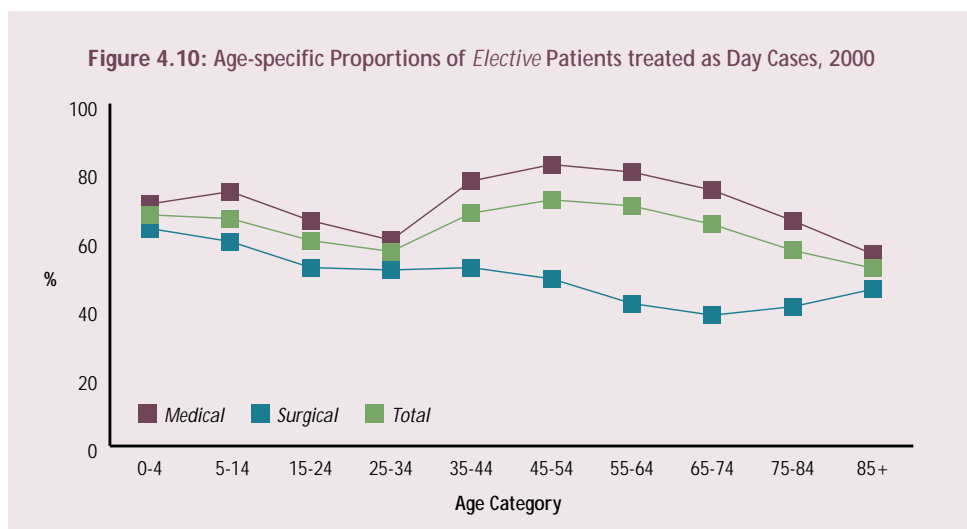


Of particular interest in the age-specific distribution of day cases is that treatment on a day basis is not confined to younger ages but extends also to the older age groups. The age-specific rates of day activity peak in the 65-74 year age category and decrease thereafter. This is driven largely by the age-specific distribution of medical day activity (Figure 4.9).



### Proportion of *Elective* Patients treated as Day Cases, 2000

Figure 4.10 presents the proportion of *elective* activity which is performed on a day basis by age category with a view to identifying possible targets for increasing day activity.



Overall, 65% of *elective* activity is done on a day basis (68% when obstetric activity is excluded). A much higher proportion of *elective* medical work is done on a day basis than elective surgical work (74% vs 49%). When the age-specific distributions are examined, it would appear that medical day activity is high across the age range except in the older age category. *Elective* surgical activity, on the other hand, decreases steadily from 63.5% (0-4) to 38.2% in the 65-74 year age group. Reasons for this are unclear and should be explored. This may represent an opportunity for change given investment in appropriate surgical day facilities. This is addressed further in Section 7.

### 4.3 Summary

- The age-specific distributions of total patients treated, inpatients discharged and, in particular, bed days used show a clear pattern of increase with advancing years. This is particularly so for inpatients with medical conditions. In the year 2000 persons aged 65+ constituted 11% of the national population, comprised 27% of the inpatient population and consumed 46% of the bed days used in acute hospitals nationally. These data are of particular significance in the estimation of future acute bed requirements due to projected demographic changes in Ireland.
- Overall, approximately 71% of inpatients were admitted as emergencies in 2000. This obscures the fact that approximately 82% of medical patients, who constitute three-quarters of all inpatients, were admitted as emergencies, compared with 37% of surgical patients. Among *medical* patients the two groups with the highest proportions admitted as emergencies were children and those aged 75+. These data have important planning implications for any proposed changes to primary care, community services and A&E services if they are to impact on emergency medical admissions.
- The age-specific distribution of day activity shows that the volume of day activity increases across the age range up to, and including, patients aged 65-74. Thereafter, day activity decreases. This pattern is dictated primarily by the age-specific distribution of medical day cases.
- The proportions of *elective* patients treated on a day basis by age group suggest that there may be potential for increased surgical day work throughout the age range given investment in appropriate surgical day facilities.



## SECTION 5

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# Current Indicators of Inadequate Hospital Bed Capacity

## 5.1 Introduction

This section examines indicators of inadequate hospital bed capacity in Ireland at this time. The immediate need for additional bed capacity may be measured by analysis of acute bed occupancy levels and current waiting lists. The level of bed occupancy is a key determining factor in the admission of a patient, whether emergency or elective, to hospital. If all beds are occupied emergency patients must wait; elective admissions will be cancelled. Emergency admissions, by their nature, take precedence over elective admissions. Thus, in a situation of fixed bed capacity and increasing emergency admissions, bed occupancy will be high and waiting lists for elective admissions will persist.

## 5.2 Acute Bed Occupancy

### Context

It might be thought that *all* beds in *all* hospitals should be occupied at *all* times (100% occupancy) for maximum efficiency and patient throughput. For several years hospitals have been under pressure to reduce bed capacity and increase occupancy rates to achieve optimal operational efficiency.<sup>29</sup> This might be possible if admission to hospital was a regular phenomenon with an identifiable pattern. In reality, hospital admission patterns can be highly irregular with little predictability. Hospitals admitting only elective patients can manage admissions and discharges in a planned way and can potentially operate at a high occupancy level. Hospitals which offer emergency services are subject to random and potentially significant fluctuations in demand for admission and must be in a position to cater for these. It is, therefore, necessary to operate at a level of occupancy which, at least some of the time, is less than 100% in order to cater for unpredictable demand. The UK Emergency Services Action Team (ESAT) has stated that the ability of hospitals to respond to peaks and troughs in the demand for services means running at bed occupancy levels which are high enough to avoid inefficiencies and low enough to avoid unresponsiveness.<sup>20, 30</sup> Defining the 'optimal' average level of bed occupancy to accomplish this is a challenge.

### 'Optimal' Bed Occupancy

'Optimal' occupancy for a given hospital will be determined by factors such as:

- the type of hospital, i.e. acute general, specialist, sub-acute, etc.
- the size of the hospital;
- the catchment area and population served;
- the nature of admissions accepted, i.e. elective, emergency or both;
- the nature of services offered, i.e. secondary care, tertiary referral services or both;
- the casemix of patients admitted; and
- staffing levels and levels of other resources.

Planning for a mean occupancy of even 90% guarantees that hospitals will have insufficient numbers of beds on a substantial number of days because of inevitable variations in daily admissions.<sup>31</sup> Estimates of the 'optimal' average occupancy level for acute hospitals with emergency admissions range from approximately 75% to 85%. The Health Care Advisory Board (HCAB) study in the USA identified problems with emergency admissions and ambulance diversions when occupancy rates exceed 75%, and have recommended maintenance of an average occupancy level of 70% to 75% to ensure optimal functioning of the hospital as a whole.<sup>25</sup> A study from the York Health Economics Consortium, University of York,

estimated that the ability to admit emergency patients and the risk of cancellation of elective patients increases once average bed occupancy levels exceed 85%. Regular bed shortages and periodic bed crises occur at higher occupancy levels.<sup>29</sup> The ESAT study modelled the ability of the NHS to respond to demand at varying levels of occupancy, and estimated that above 82% average occupancy cancellations 'take off'. Average occupancy rates of 82% were also shown to be associated with 'trolley waits' in A&E and patients outposted to 'foreign' wards. That critical level is somewhat dependent on hospital size and is slightly delayed in the larger hospital.<sup>30</sup> There is general agreement in the literature that occupancy levels above 85% are associated with significant limitations on the ability of acute hospitals to respond to demand, with long delays in A&E for admission and cancellation of elective admissions and procedures. It has been estimated that, while 85% average occupancy may be appropriate for hospitals with more than 150 beds, somewhat lower average occupancy levels are required for smaller hospitals.<sup>32</sup>

**For the purposes of this exercise, an average bed occupancy of 85% has been chosen as the benchmark against which the need for additional bed capacity in Ireland will be assessed.**

## Measuring Bed Occupancy

Inpatient bed occupancy is the most widely used measure of hospital capacity.<sup>25</sup> Occupancy is measured by recording the number of *bed days used* as a function of the number of *bed days available*.<sup>16</sup>

$$\% \text{ Occupancy} = \frac{\text{Bed Days Used (N)} \times 100}{\text{Bed Days Available (N)}}$$

where: bed days used = sum of LOS of each inpatient;

bed days available = number of beds x number of days on which available

Although this would appear quite straightforward, there are several potential sources of error and variation in the measurement of bed occupancy. They include the following:

- certain beds may be included inappropriately in the computation of bed days available, e.g. beds which are temporarily closed or unstaffed, and specialised beds not available for general use;
- bed occupancy is typically recorded at midnight, thus overlooking the daytime peak which typically occurs before patients are discharged and while others are waiting to be admitted. The HCAB cite the need to adjust for daytime peak/turnover which could be as high as 20% to 25%;<sup>25</sup>
- bed occupancy rates reported are usually average annual rates, thus obscuring important daily, weekly, seasonal and incident-related variation in occupancy and ignoring the duration of peaks and troughs in occupancy levels.

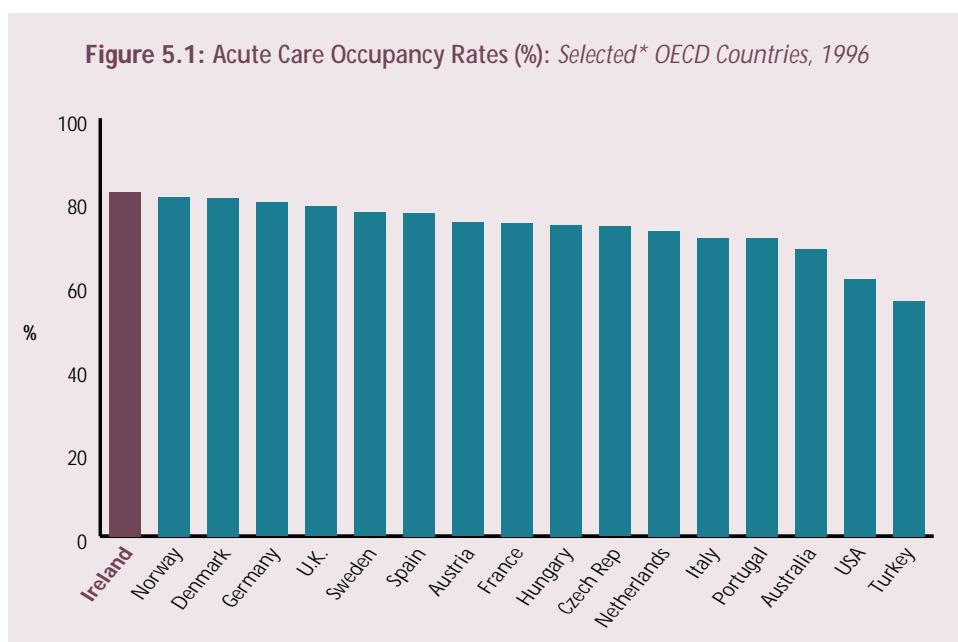
Ideally, bed occupancy should be measured on staffed beds at noon, excluding beds which should not be included. If assessing the occupancy of medical and surgical beds, beds for other specialties e.g. obstetrics, paediatrics and psychiatry should ideally be excluded to give a 'purer' measure of medical and surgical bed occupancy.<sup>25</sup>

## Current Bed Occupancy in Ireland

Data on hospital bed occupancy levels in Ireland are derived from the monthly IMR's returned by all hospitals to the DOHC. Included is the average number of inpatient beds, the number of available bed days, number of inpatients discharged and the number of bed days used. Instructions for the completion of IMR data by hospitals outline the need to adjust the number of available bed days for 5-day beds, closed beds or extra beds.

IMR data would indicate that overall bed occupancy in 2000 was 83.3%. However, occupancy levels in the major hospitals were higher and ranged from 85.9% to 94.7%. Submissions on bed requirements invited by DOHC from each Health Board and the ERHA in May 2000 identified high bed occupancy as one of the main concerns. High occupancy levels were cited as one of the reasons for lengthy delays in A&E departments when admission to hospital is required. Hospitals reported occupancy levels of 90% to 100% at various times.

A comparison of acute care occupancy levels for 1996 across OECD countries revealed that Ireland had the highest average occupancy level (83%) when compared with those for whom this information is available (Figure 5.1).



\*Selected = Countries for which 1996 data are available

Source: OECD Health Data, 2000. A Comparative Analysis of 29 Countries. OECD Health Policy Unit, Paris

## Estimation of Impact on Bed Need

The objective of this exercise is to estimate the additional bed capacity which would be required to reduce average occupancy levels to 85% in those hospitals currently running at higher levels.

**Figure 5.2: Estimated Impact of Average Bed Occupancy Levels on Bed Need**

<b>Step 1</b>	Average bed occupancy level in 2000 for all hospitals nationwide (IMR data) <b>Average occupancy 83.3%</b>
<b>Step 2</b>	Average bed occupancy level adjusted for 5-day beds and bed closures, reducing bed days available by 107,500 (Details in <i>Technical Report</i> <sup>see p.14</sup> ) <b>Average adjusted occupancy 85.4%</b>
<b>Step 3</b>	Hospitals with average adjusted occupancy level greater than 85% identified Number of hospitals 23 Number of beds 6,138 Average occupancy level 95.1% Range of occupancy levels 85.6% - 123.3%
<b>Step 4</b>	Additional beds required to reduce average occupancy level from 95% to 85% (approximately 12% increase in bed complement) in 23 hospitals computed (Details in <i>Technical Report</i> <sup>see p.14</sup> )
<b>Estimate of Impact</b>	<b>Approximately 850 additional beds @ 85% occupancy</b>

## Intensive Care Unit (ICU) Occupancy Levels

A related issue is the occupancy levels being experienced in the ICU's of acute hospitals. In a recent survey of the five major teaching hospitals in the ERHA, the average ICU occupancy was 97%.<sup>33</sup> Average ICU occupancy level was 95% for the two paediatric hospitals and 91% for two major hospitals outside the EHRA. The European Society of Intensive Care Medicine has recommended an average occupancy level of 75% for intensive care beds.<sup>34</sup> Any computation of additional beds required to alleviate bed occupancy levels must take this into account.

In 2000 there were 38 hospitals in Ireland with 259 ICU beds. This represents 2.2% of all acute beds, which is in line with internationally accepted levels.<sup>35,36</sup> The issue here is not so much the addition of ICU beds, as the addition of general hospital capacity to allow for timely discharge from ICU.<sup>33</sup> The HCAB has emphasised the need to reduce inappropriate utilisation in ICU before expanding ICU capacity.<sup>25</sup>

In estimating additional need due to ICU occupancy, it is assumed that the average occupancy of the ICU beds is at least the same as the occupancy of the hospital as a whole. The computation of need for additional beds based on ICU occupancy was adjusted to eliminate 'double counting' related to the different benchmarks used, i.e. 85% for general hospital beds, 75% for ICU beds. (details in the *Technical Report*<sup>see p.14</sup>)



**Figure 5.3: Estimated Impact of ICU Occupancy Levels on Bed Need**

<b>Step 1</b>	Average occupancy level for ICU's nationwide computed Number of hospitals 38 Number of ICU beds 259 Average adjusted occupancy 88.0% Range of occupancy levels 71.5% - 123.3%
<b>Step 2</b>	ICU beds in hospitals with occupancy greater than 85% identified Number of hospitals 19 Number of ICU beds 152 Additional beds due to occupancy greater than 85% computed in Step 2, Figure 5.2
<b>Result</b>	<b>To reduce ICU occupancy from 85% to 75%, 27 beds required</b>
<b>Step 3</b>	ICU beds in hospitals with occupancy less than 85% identified Number of hospitals 19 Number of ICU beds 107 Average occupancy 78.2%
<b>Result</b>	<b>To reduce ICU occupancy from 78.2% to 75%, 6 beds required</b>
<b>Estimate of Impact</b>	<b>Approximately 33 beds required (75% occupancy)</b>

## Conclusion

It is estimated that approximately 883 beds are required to adjust for the high average bed occupancy levels being experienced in the major hospitals and ICU's nationwide. It is important to note that this assessment is based only on those hospitals with average occupancy levels greater than 85%. In relation to the estimate of need based on ICU occupancy, it is important to note that the additional beds need not be ICU beds. This is in line with experience elsewhere.<sup>25</sup>

## 5.3 Waiting Lists for Elective Procedures

### Context

The pattern of referral of patients to hospital for elective treatment is irregular and unpredictable. To treat all patients at the time they are referred would require an excess capacity in some periods to allow for adequate capacity in peak periods.<sup>37</sup> The probability of excess capacity can be reduced if patients can be placed on a waiting list for elective procedures and their treatment planned to coincide with some predetermined schedule of treatment.<sup>37</sup> What is at issue is not so much the *existence* of a waiting list as the *size* of the list and the *duration* of the wait. This is not unique to Ireland. Waiting lists are used extensively as performance indicators in healthcare.<sup>38</sup>

Trends in clinical activity in Ireland since 1995 show that inpatient numbers increased by 2% even though bed numbers decreased by approximately 1%. Even more striking is that medical inpatients increased by 4% matched by a decrease in surgical inpatients. In order to meet the waiting list targets outlined in the Health Strategy, *Quality and Fairness: A Health System for You*, hospitals must find a way to increase surgical activity. Given that the waiting list is an 'inpatient' list, this can only happen if the capacity of hospitals is increased to meet the need.

This raises an issue in relation to the need to retain the additional capacity required on an ongoing basis. Evidence from the UK has shown that increased admissions from waiting lists related to various waiting list initiatives improved waiting times, but did not reduce list size.<sup>38, 39</sup> This is corroborated by research data showing that additions to waiting lists are negatively influenced by waiting time.<sup>40, 41</sup> The corollary of this is that as waiting times decrease, new patients are added. It suggests that the ability to meet need influences patients and their doctors to translate previously unmet need into demand for hospital services,<sup>39</sup> and points to the need for a longer term investment in capacity to adequately address waiting lists, waiting times and unmet need.

### Compilation of Waiting Lists

Patients who require certain elective treatments are placed on waiting lists by consultant staff in individual hospitals usually following an outpatient visit. Waiting list data are collated by the DOHC, based on quarterly returns from the Health Boards and ERHA. Data are provided by specialty, as defined by the specialty of the outpatient clinic.

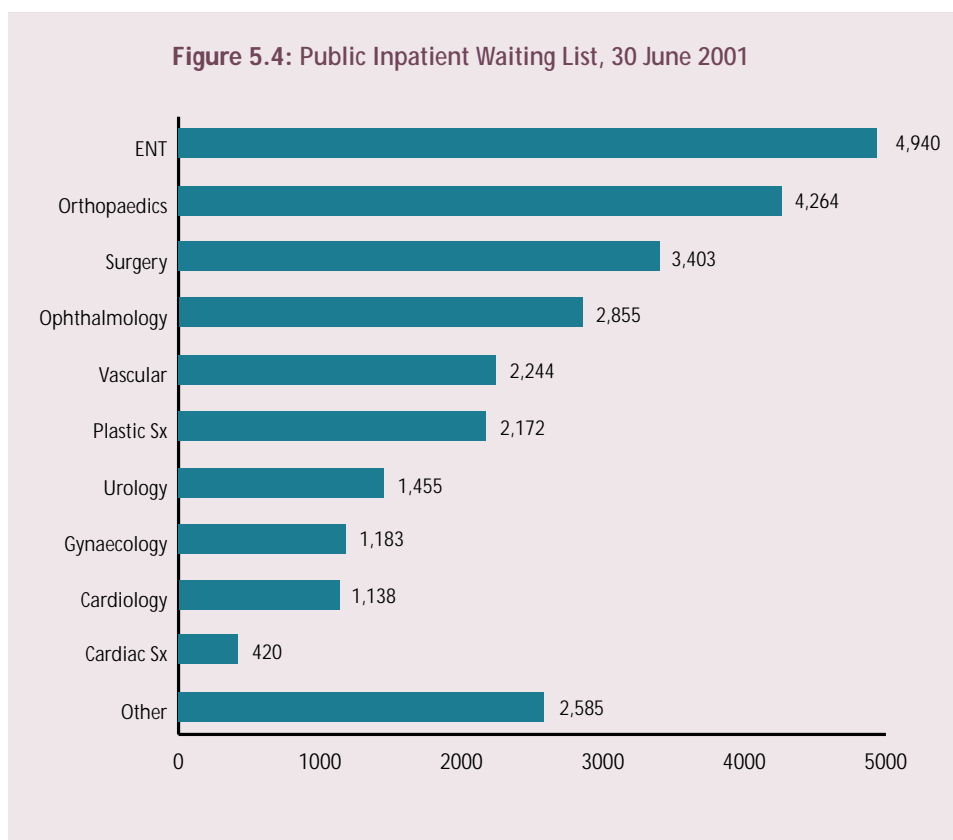
There are certain limitations to existing waiting list data which should be noted:

- the age of the patient is not routinely recorded centrally. Limited information on 'age' is available for certain specialties. Patients are designated as children or adults in respect of the target specialties of Cardiac Surgery, ENT, Gynaecology, Ophthalmology, Orthopaedic Surgery, Plastic Surgery, General Surgery, Urology and Vascular Surgery;
- there is no standardised recording of the procedure awaited. Thus, the type and number of procedures awaited by specialty is not available centrally;
- it is not possible to accurately assess whether a proportion of the procedures awaited by patients on the 'inpatient' waiting list could be done on a day basis;
- information on area of residence of the patient is not recorded centrally.

It is anticipated that these information gaps will be addressed in the context of revised waiting list arrangements proposed in the Health Strategy.

## Current Waiting Lists in Ireland

As of June 30, 2001 there were 26,659 patients nationally waiting 3 months or more for elective inpatient procedures. Figure 5.4 shows the numbers awaiting treatment by specialty.



The specialties with the highest number awaiting elective treatment are ENT, Orthopaedics, General Surgery, Ophthalmology, Vascular Surgery, Plastic Surgery, Urology and Gynaecology. Approximately 90% of patients are awaiting surgical treatment.

## Estimation of Impact on Bed Need

The objective of this exercise is to estimate the additional beds which would be required to ensure that patients awaiting elective procedures do not wait longer than three months. Certain assumptions must be made. In relation to the need for inpatient admission, one calculation has been done assuming that *all* waiting list patients require inpatient admission. A second calculation assumes that approximately one-third of waiting list patients could be treated on a day basis. In relation to procedures awaited and ALOS, it is assumed that the profile of procedures and the ALOS of the waiting list patients are similar to those of inpatients in the same specialties admitted electively. Estimates are provided in Figure 5.5.

**Figure 5.5: Estimated Impact of Waiting Lists on Bed Need**

Step 1	The number of patients in each specialty awaiting treatment for three months or more, June 2001		
Step 2	ALOS for elective inpatients in each specialty x number of patients on the Waiting List in that specialty = Bed Days required		
Step 3	Beds required @ 85% occupancy computed		
Estimate of Impact	Assumption	Additional Beds Required @ 85% occupancy	Additional Day Cases
	• All waiting list patients require inpatient treatment	492	0
	• Approximately one-third of waiting list patients could be treated as day cases	322	9,330

If *all* waiting list patients require inpatient admission, 492 beds would be required. If approximately *one-third* of waiting list patients could be treated on a day basis, 322 beds would be required. However, additional facilities to treat 9,500 additional surgical day cases would be required, including approximately 40 day beds. Details are provided in the *Technical Report*. <sup>see p.14</sup>

## Conclusion

The higher estimate of the number of beds required to cater for waiting list patients arises logically from the assumption that *all* waiting list patients require inpatient admission. The lower estimate of the number of beds required is contingent upon significant development of day surgery facilities and a shift in treatment emphasis to day surgery.



## SECTION 6

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Factors which will  
increase the need  
for Hospital Beds

## 6.1 Introduction

This section examines factors which will increase the need for acute hospital beds in Ireland over the next decade. Paramount among these are the demographic changes projected to occur and increasing demand for healthcare over and above that due to demographic change.

## 6.2 Projected Demographic Changes

### Context

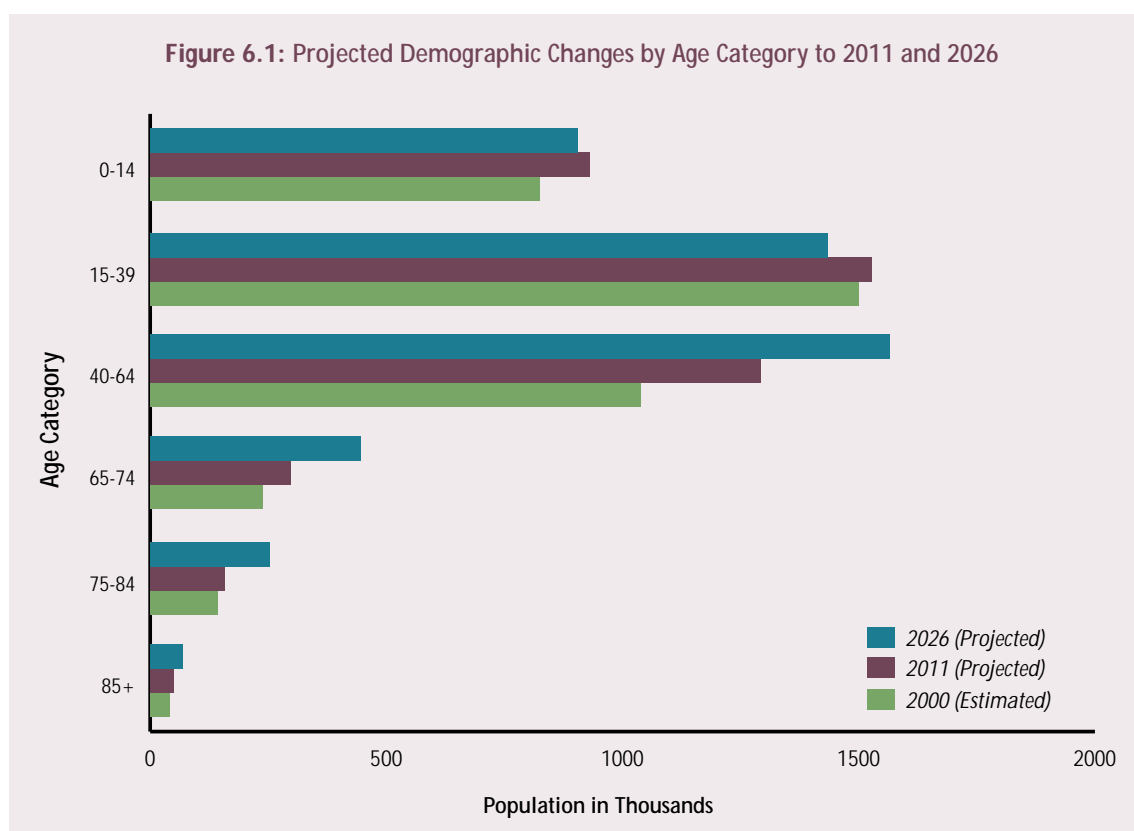
Projected demographic changes refer to changes in the size and age structure of the population which are predicted to take place over the coming decades. Ireland has had a unique demographic profile in recent years compared with other EU countries, as evidenced by a higher proportion under 15 years and 15-44 years and a lower proportion of elderly people<sup>16</sup> (details in the *Technical Report*<sup>see p.14</sup>). That is about to change. For almost 30 years, up to 1981, the birth rate remained stable at approximately 22 per 1,000 population. Between 1981 and 1998 the birth rate dropped by 33% to 14.5 per 1,000.<sup>16</sup> Mortality has decreased steadily from 11.7 per 1,000 in 1953 to 8.5 per 1,000 in 1998.<sup>16</sup> The recent population growth is due to a combination of increased longevity and net immigration to the adult working population due to improved economic circumstances. These factors combined will determine the age structure of the Irish population in the coming decades. The OECD recognises that the Irish population is now entering a phase when the number of older people will start to grow more rapidly than the total population and this will affect the demand for health services.<sup>19</sup>

The importance of demographic changes to health policy cannot be underestimated, and should be planned for, since the age-sex composition of the population for several decades is known.<sup>42</sup>

### Projecting Demographic Changes

Population projections based on census data are carried out by the CSO by applying a mathematical model to a number of assumptions about factors that affect the population. The factors are fertility (high, medium, low), mortality and migration (high, low). Details of each level of these assumptions are given in the *Technical Report*.<sup>see p.14</sup> Population projections differ depending on what combination of assumptions is used. Projections of the size and age structure of the population, based on census years up to and including 1996, have been made up to 2031.<sup>16</sup>

Figure 6.1 and the accompanying table give the projected population changes for Ireland to 2011 and 2026 using the M1F1 assumption (see *Technical Report*<sup>see p.14</sup>).



	2000 (Estimated)		2011 (Projected)		2026 (Projected)	
	N	%	N	%	N	%
0-14	824,400	21.8	931,100	21.9	904,900	19.4
15-39	1,500,300	39.6	1,528,200	35.9	1,434,800	30.7
40-64	1,038,300	27.4	1,291,600	30.4	1,565,000	33.5
65-74	238,600	6.3	296,400	7.0	445,400	9.5
75-84	143,800	3.8	157,200	3.7	252,600	5.4
85+	41,700	1.1	50,300	1.2	69,300	1.5
<b>Total</b>	<b>3,787,100</b>	<b>100.0</b>	<b>4,254,800</b>	<b>100.0</b>	<b>4,672,000</b>	<b>100.0</b>

Currently, 22% of the population are children, 67% are adults (15-64) and 11.2% are aged 65+. The total population is projected to increase by 23% by 2011. The proportions of children and those aged 15-39 years will decrease. The proportions in all age groups above 40 years will increase. The number aged 65+ will increase by approximately 80,000, but will still constitute just 11.9% of the population. A major shift occurs thereafter. By 2026, 16.4% of the population (n=767,300) will be aged 65+.

## Estimation of Impact on Bed Need

The objective of this exercise is to assess the likely impact of projected demographic changes for Ireland on hospital bed requirement by 2011. Based on recent trends in fertility and migration, the CSO recommendation in relation to this exercise was to use projections derived using the M1F1 assumptions, i.e. the higher estimate of population growth.

The need for additional beds was estimated by applying the age-specific rates of bed day use in 2000 to the age distribution of the projected population in 2011.



**Figure 6.2: Estimated Impact of Projected Demographic Changes on Bed Need**

Step 1	CSO population projections to 2011 using the M1F1 assumption					
Step 2	Application of age-specific bed day use in 2000 to the projected population in 2011. Estimation of additional bed days/beds required at 85% occupancy					
	Age Group		Bed Days Used in 2000		Projected Population in 2011	Additional Beds Req'd @ 85% Occupancy
		N	Rate/1,000		N	N
	0-14	300,082	364.0	931,100	125	
	15-39	698,665	465.6	1,528,200	41	
	40-64	798,020	768.5	1,291,600	627	
	65-74	608,318	2549.5	296,400	475	
	75-84	668,723	4650.3	157,200	200	
	85+	244,622	5866.2	50,300	163	
	TOTAL	3,318,430	876.2	4,254,800	1,631	
Estimate of Impact	Approximately 1,630 beds required @ 85% occupancy					

## Conclusion

The estimations outlined above of acute bed need suggest that approximately 1,630 additional beds will be required by 2011 in order to meet demographic changes. These estimates are based on the assumption that current treatment patterns and practices regarding admission to hospital in Ireland continue unchanged and in the absence of other developments which might reduce that need. It should be noted that even greater changes to the age profile of the population are projected to take place after 2011.

## 6.3 Changes in Demand for Healthcare

### Context

There are two definitions of 'demand' which are potentially relevant to healthcare. They are: *"request made as of right or peremptorily"* and *"desire of would-be purchasers or users for commodity"*.<sup>43</sup> One can think of services to which people are entitled and therefore are likely to demand as of right, while other services might fall into the category of 'desirable' but not 'essential'. It is also relevant to consider that perceptions of services which are deemed to be 'essential' and those which might be regarded as 'desirable' may vary over time. This may be due to changing patterns of disease occurrence, changes in the availability and efficacy of diagnostic and therapeutic interventions, and changing economic circumstances in a given health care environment. Furthermore, each individual's perception of 'essential' and 'desirable' services will be influenced by their age, their own health status and that of their families and, potentially, by their social and economic circumstances.

That demand for healthcare is increasing has been noted by several authors.<sup>21, 25, 44-48</sup> Reasons given include:

- a larger, better educated and more demanding middle class;<sup>21, 45</sup>
- increased expectations. There is now substantial literature on the growth of 'consumerism' in healthcare, ranging from issues of healthcare quality, satisfaction guarantee, patient power, its contribution to health care reform, consumer participation, the desire for information and input into decision making;<sup>44, 46</sup>
- higher per capita income. As people become wealthier they demand, not simply more healthcare, but also more convenience, higher levels of comfort and a more personalised service;<sup>47, 48</sup>
- previously unmet need. Comparative studies demonstrate that the rates of certain procedures per head of population between populations with similar epidemiology of disease can point to unmet need in certain areas. This applies to a number of areas within the Irish healthcare system, such as the number of patients who could be placed on waiting lists for elective procedures, but for whom the prospect of a lengthy wait is unacceptable;
- increasing demand for active intervention of chronic conditions;<sup>21, 48</sup> and
- increasingly accessible health information through the media, health promotion efforts and internet access.

Several authors suggest that supply factors may be just as important as demand factors in determining overall healthcare development and costs.<sup>25, 44, 48</sup> Among them are:

- the increasing range of available medications for prophylaxis, secondary prevention and treatment;
- technological advances in diagnosis and treatment; and
- development of new services, e.g. screening and minimally invasive surgery.

Advances in technology are seen as a double-edged sword, with new diagnostic capabilities potentially contributing to an increased need for inpatient services.<sup>25</sup>

The OECD Economic Survey of healthcare in Ireland suggested that the pressure on the Irish health services induced by demographic change *"is likely to be outweighed by the increasing expectations of healthcare as consumer incomes grow"*.<sup>19</sup>

## Measuring Increased Demand

Despite the list of possible reasons for changing demand, demand for hospital care is poorly understood and under researched.<sup>31</sup> Variables used to measure demand include inpatient admissions, forecasted admissions, outpatient visits, and the casemix index.<sup>49</sup>

Other indices such as occupancy rates, number of hospital beds and wage rates are also measured, but have more to do with estimation of hospital costs than with demand.<sup>49</sup>

## Demand for Healthcare in Ireland

Some estimate of increasing demand for healthcare in Ireland can be derived from the following data:

- increasing attendance at **A&E** departments. Since 1988 attendances at A&E have increased by 22%, during which time the population increased in size by approximately 7% (1988-2000);
- increasing attendances at hospital **outpatient** departments: In 1980, there were 1.46 million visits to the outpatient departments of acute hospitals. In 2000 there were approximately 2 million outpatients visits, an overall increase of 37%, or an average annual increase of 1.8%, during which period the population increased by 10% (1980-2000);
- increasing **day activity**: The increase in day activity in Ireland has been dramatic. Since 1980 the number of day cases has increased from approximately 8,500 to 320,000. There has been a 68% increase in the number of day cases treated since 1995, an average annual increase of 13.5%;
- **inpatient** admissions: Taken as a whole inpatient admissions have remained relatively stable over 20 years, despite a 40% reduction in acute hospital beds. This remarkable phenomenon has been accomplished through a steady reduction in ALOS. There was a 2% increase in inpatient admissions between 1995 and 2000 despite a slight reduction in bed numbers and bed closures;
- doctor **consultations per capita**. The OECD has compiled consultation data for member countries for selected years. The median number of consultations per capita increased by 12% between 1980 and 1996, or an average annual increase of 0.7%.<sup>19</sup>

Between 1980 and 2000 the population of Ireland increased by an average of 0.5% per annum. Clearly, with the exception of inpatient admissions, other hospital and healthcare activity has increased significantly beyond that which might be expected due to population growth alone.

## Estimation of Impact on Bed Need

The objective of this exercise is to estimate the impact of increasing demand for hospital care in Ireland over the next decade. Planners differ in their assumptions about future growth in demand. Some assume increases in demand in excess of those suggested by population growth. Others ignore these exogenous factors, and in a few cases assumptions have been made that demand may be reduced.<sup>31</sup>

The Health Care Advisory Board regard a conservative estimate of increasing demand as that due to demographic changes alone. In the USA this has been estimated as being 1.6% per annum from 2000-2006. A moderate increase in demand of 3.5% per annum includes that due to demographic change (1.6% per annum) and factors such as those outlined above (1.9% per annum). In a review of bed capacity carried out by the ERHA an estimate of demand of 0.5% per annum was used.

For the purposes of this exercise, supported by the activity data outlined, an estimated increase in demand of 1% per annum has been selected. Over 10 years to 2011, this represents a compound total adjustment of 10.46% to existing bed complement. The assumption is that demand increases in a linear fashion over the decade. This may not be the case if, for example, there is a significant change in the economy, or a significant advance in an area of medicine likely to result in a sudden increase in demand.

**Figure 6.3: Estimated Impact of Demand for Healthcare on Bed Need**

<b>Step 1</b>	Review of the evidence pertaining to increased demand for healthcare
<b>Step 2</b>	1% per annum increase in demand = 10.46% cumulative increase over 10 years
<b>Step 3</b>	Applied to the existing bed complement (11,832) corrected for current occupancy levels in the major hospitals (+ 883)
<b>Estimate of Impact</b>	<b>Approximately 1,330 beds required</b>

## Conclusion

It is estimated that an additional 1330 beds are required, over and above those required due to projected demographic change, to accommodate increasing demand for healthcare over the coming decade.



## SECTION 7

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# Strategies to reduce the need for Hospital Beds

## 7.1 Introduction

This section examines various strategies which could alleviate pressure on acute hospital beds and reduce the need for additional beds if implemented. Each strategy requires significant investment.

## 7.2 Reducing Inappropriate Days of Stay in Acute Hospitals

### Context

Inappropriate days of stay in acute hospitals may be due to:

- bed days lost in *the course of treatment* due to cancellation of investigations / procedures or inefficient co-ordination of required medical and allied health professional services; or
- bed days lost due to *delayed discharge*, i.e. the inability to discharge patients who have completed their acute medical care and who could be discharged to more appropriate forms of care. These include appropriate placements and/or community services for elderly patients, rehabilitation facilities for selected patients of all ages and specific facilities for disabled and young chronic sick patients.

Studies of inappropriate use of acute hospital beds have been carried out in many different countries and healthcare settings over several years.<sup>50,51</sup> A recent systematic review of over 50 such studies internationally, covering the 10-year period 1988-1998, presents findings on the extent of inappropriate acute bed use.<sup>52</sup> These are summarised for selected patient groups in Table 7.1.

**Table 7.1:** Summary of International Studies of Inappropriate Bed Use

		Number of Studies Reviewed	Inappropriate Days of Stay (%)
General adult population	- Range	28	6-62%
Children	- Range	8	12-40%
Older patients	- Range	13	6-78%
	- Best estimate		20%

The range of inappropriate days of stay is so broad that it raises questions about the measurement, definition and assessment of inappropriate days of stay.

### Measuring Inappropriate Days of Stay

Concerns identified regarding the measurement of inappropriate days of stay were as follows:

- many studies do not clearly define what is meant by 'inappropriate' use. For the most part it seems to imply the use of acute hospital beds by patients whose acute medical care is complete. Few studies address the issue of loss of bed days due to inefficiencies such as cancellation of investigations or procedures;
- the 'gold standard' against which the designation of 'inappropriate' is made varies from study to study. It may be decided by one person or a panel, physician or non-physician. Though objective measurement tools have been developed, a certain degree of subjectivity in the designation persists; and
- results may vary depending on the type of hospital studied, the patient sub-group targeted or the timing of the study, i.e. whether retrospective or concurrent.

Quantifying the potential for improved efficiency in the throughput of patients in the acute hospital (from admission to completion of acute medical care) is difficult. Furthermore, it has been suggested that current inefficiencies in the hospital system are compounded by the capacity problems, and are unlikely to improve unless capacity is increased.<sup>53</sup> Quantifying bed days lost due to delayed discharge is somewhat more straightforward. These data have been used to estimate a percentage offset against the additional bed requirement identified in this review.

## Delayed Discharge in Ireland

Data from the Health Board submissions (May 2000) suggested that the proportion of bed days lost due to delayed discharge in several hospitals is in the region of 10-12%. These tended to be the hospitals with high average bed occupancy levels, i.e. greater than 85% occupancy.

An indepth study of delayed discharge was carried out at one major hospital during the year 2000. The reasons for delayed discharge and the number of bed days lost were recorded by age group. Data are provided in Table 7.2.

**Table 7.2:** Bed Days Lost due to Delayed Discharge, 2000 (Reproduced with permission)

Reasons for Delayed Discharge	Age <65 yrs		Age ≥65 yrs		Total	
	N	%	N	%	N	%
Awaiting:						
Long-term care	2,861	50.2	6,743	49.5	9,604	49.7
Rehabilitation placement	1,292	23.0	2,134	15.6	3,426	17.7
Bed in another hospital	449	8.0	879	6.4	1,328	6.9
Hospice bed	292	5.1	564	4.2	856	4.4
Short-term convalescence	83	1.4	683	5.0	766	4.0
Private nursing home placement	15	0.3	251	1.8	266	1.4
Housing allocation	18	0.3	85	0.6	103	0.5
Social / Community support	598	10.4	1,828	13.4	2,426	12.6
Adapted housing / Equipment	21	0.3	241	1.9	262	1.4
Transport	50	0.8	33	0.2	83	0.4
Miscellaneous	16	0.2	187	1.4	203	1.0
<b>TOTAL</b>	<b>5,695</b>	<b>100.0</b>	<b>13,628</b>	<b>100.0</b>	<b>19,323</b>	<b>100.0</b>

The total of 19,323 bed days lost due to delayed discharge represented approximately 12% of bed days used in that hospital that year. Major points of note are:

- 85% of bed days lost were due to lack of appropriate placement facilities (long-term care, rehabilitation, hospice care, convalescence, etc.);
- 15% of bed days lost were due to inadequate social / community support services to enable return to home;
- patients over 65 years accounted for 70% of the bed days lost;
- patients awaiting placement for rehabilitation accounted for 18% of the bed days lost. The need for rehabilitation was not confined to those in older age groups.

## Estimation of Impact on Bed Need

The objective of this assessment is to estimate the number of acute hospital beds which could be made available if patients who have completed their medical treatment could be discharged without delay. It is considered that 12% is a reasonable estimate of the proportion of bed days which are lost due to delayed discharge, at least in the major hospitals.

**Figure 7.1: Estimated Impact of Measures to reduce Delayed Discharge on Bed Need**

<b>Step 1</b>	Estimation of the % of bed days lost due to delayed discharge (approximately 12%)
<b>Step 2</b>	Bed days used in hospitals with average occupancy greater than 85% (IMR data, 2000) = 2,053,901
<b>Step 3</b>	Estimate of bed days lost due to delayed discharge in hospitals with occupancy greater than 85% = 246,468
<b>Estimate of Impact</b>	<b>Approximately 675 beds could be made available</b>

## Conclusion

It is estimated that the equivalent of 675 beds could be made available in acute hospitals if measures to reduce delayed discharge were put in place. These include appropriate placement facilities and community support services, both of which require significant investment and organisation in order to be effective.



## 7.3 Potential use of Capacity in Hospitals with Average Occupancy less than 85%

### Context

Section 5 considered the issue of 'optimal' average bed occupancy and provided an estimate of the number of additional beds which would be required to reduce average occupancy levels in major hospitals to 85%. Some hospitals have reported average occupancy levels less than 85%. The issue is whether there is capacity in these hospitals which could be used to alleviate part of the occupancy problem of the major hospitals.

### Measuring Potential Available Capacity

The issues to consider in estimating the potential capacity available in the system are as follows:

- hospitals with reported average occupancy levels less than 85% are primarily those without A&E departments. None of these hospitals have regional or national specialties. Some are single specialty hospitals;
- 'optimal' average occupancy level is, in part, dependent on hospital size, with appropriate occupancy being lower for smaller hospitals;<sup>32</sup>
- transferring patients from hospitals with greater than 85% occupancy to those with less must take account of the need for, and availability of, specialist services and resources to treat multi-system disease;
- hospitals with less than 85% occupancy include some maternity and paediatric hospitals, and others which could not cater for patients from an acute general hospital; and
- any assessment of the potential movement from one hospital to another must take account of geographical location.

### Potential Available Capacity Nationwide

For the assessment of potential capacity which might be available, account should be taken of recommended occupancy levels for smaller hospitals.<sup>32</sup> Data on hospital bed occupancy levels are derived from monthly IMR's returned by all hospitals to the DOHC. IMR data for 2000 indicate that there were 26 hospitals with reported average occupancy less than that which is regarded as appropriate for size. The average occupancy of these hospitals was 75.4%. Details are provided in the *Technical Report*.<sup>see p.14</sup>

### Estimation of Impact on Bed Need

Estimation of capacity which might be available for use nationwide is given in Figure 5.4. Even within this, there are issues of transfer of patients, distance to travel and specialty issues which may make it less than feasible to utilise that capacity.

**Figure 7.2: Estimated Potential to use Available Capacity**

<b>Step 1</b>	Hospitals, excluding maternity and paediatric hospitals, with potential available capacity		
	Number of hospitals		26
	Number of beds in these hospitals		4,753
	Average occupancy level		75.4%
	Range of reported occupancy levels		21.6%-84.6%
<b>Step 2</b>	Adjustment for hospital size, specialty restrictions and geographic restrictions		
	Details in the <i>Technical Report</i> . <sup>see p.14</sup>		
<b>Estimate of Impact</b>	<b>Approximately 200 beds could be made available</b>		

### Conclusion

An assessment of the potential use of capacity in hospitals with average occupancy less than 85% would suggest that the equivalent of 200 beds might be available for use. However, the use of this capacity is contingent upon necessary investment to cater for different types of patients.

## 7.4 Substitution of Elective Inpatient Surgery with Day Surgery

### Context

The traditional role of hospitals is being challenged in all industrialised countries. Faced with increasing costs due to new technologies, increasing demand and ageing populations, there is increasing pressure to develop strategies to contain costs and improve efficiency.<sup>54</sup> Increasing the number of procedures undertaken as day cases represents one such strategy. This has been facilitated by significant developments in anaesthesia, minimally invasive surgery and post-operative analgesia.<sup>55</sup> Ambulatory surgery was introduced in 1970 and has been practised most extensively in the USA, where it is estimated that by now approximately 75% of all surgical procedures are performed on a day basis.<sup>55</sup> Other developed countries are catching up. The UK Government has set a target of 75% of all elective surgical procedures to be carried out as day cases.<sup>56</sup>

The emergence of day activity as a significant component of hospital-based care in Ireland has been profiled in Section 3. Of *elective* patients treated in publicly-funded hospitals in 2000, 68% were treated as day cases. Day activity is expected to continue to grow in volume. What is at issue is the ability of day work to substitute for inpatient work. Many plans assume that growth in day cases will represent a direct substitution for inpatient work.<sup>31</sup> Evidence shows, however, that much of the growth is the result of new techniques and technology,<sup>31</sup> and does not necessarily substitute for inpatient work.

### Measuring the Potential to Substitute Inpatient with Day Work

To assess the potential to substitute inpatient with day work, it is best to examine medical and surgical day activity separately.

**Medical day activity:** This constitutes almost three-quarters of all day work. It is comprised predominantly of procedures on the digestive system and treatment of patients with cancer. Medical day activity is expected to continue to increase due to advances in medical technology, telemedicine and increased demand. It is unlikely, however, that this will substitute for inpatient work and may even contribute to inpatient needs.<sup>25</sup> In 2000, 78% of *elective* medical patients in Ireland were treated on a day basis.

**Surgical day activity:** Any attempt to substitute inpatient with day work is likely to be most successful if targeted at *elective* surgical procedures. The advent of minimally invasive surgical techniques, in particular laparoscopic surgery, allows for expansion in the variety and complexity of procedures which can safely be done on a day basis.<sup>55</sup> In 2000, 50% of *elective* surgical patients in Ireland were treated on a day basis. In order to increase this proportion investment in day facilities is essential, though changes in clinical practice and patient acceptance of day procedures are also important.

Benchmarks for the proportions of selected surgical procedures which can be carried out as day cases have been established by the UK Audit Commission (AC)<sup>57, 58</sup> and the British Association of Day Surgery (BADS).<sup>56</sup> The AC 'Basket' of 20 procedures accounts for "a substantial proportion of day surgery and covers all the main surgical specialties".<sup>58</sup> These procedures have been assessed by expert clinicians as generally suitable for day surgery, but of sufficient complexity to make it unusual for them to be carried out as outpatients. The BADS has modified and updated the AC 'Basket', adding 20 more procedures, of which it is suggested that 50% could be done as day cases. This is called the BADS 'Trolley' of procedures.<sup>56</sup> The data compiled by the AC and BADS are based on *elective* admissions and are confined to selected procedures from individual specialties. The combined list of AC and BADS procedures are given in Appendix III.

### Day Surgery in Ireland

To examine the proportion of *elective* surgery performed on a day basis in Ireland, HIPE data for 2000 were analysed. Data are presented in Table 7.3. 'Procedures' refers to the types of surgical procedures carried out; 'operations' refers to the numbers of those procedures performed. Data are given separately for all *elective* surgery, and for the AC 'Basket' and the BADS 'Trolley' of procedures.

**Table 7.3:** Elective Surgery in Ireland, excluding Obstetrics 2000:  
Total, AC 'Basket' and BADS 'Trolley' of procedures and operations

Elective Surgery	All	AC 'basket'	BADS 'Trolley'	AC + BADS
Procedure types	All	19	20	39
Operations	141,919	48,708	12,963	61,671
Day based	71,493	29,178	5,343	34,521
	(50%)	(60%)	(41%)	(56%)
LOS of inpatients (days)				
Mean	5.8	2.5	4.9	3.2
Median	3.0	2	4	3

Of all *elective* operations (141,919), 50% were done on a day basis. The 19 procedures of the AC 'Basket' resulted in 48,708 elective operations, of which 60% were done on a day basis. The 20 procedures of the BADS 'Trolley' resulted in 12,963 operations, of which 41% were done on a day basis.

## Estimation of Impact on Bed Need

The objective of this exercise was to estimate the number of inpatient beds which could be made available by substitution of elective inpatient surgery with day surgery.

This computation makes important assumptions:

1. that a certain proportion of elective surgical procedures, currently being performed as inpatient procedures, could be done on a day basis;
2. that the benchmarks derived by the UK AC and BADS are relevant and feasible in Ireland; and
3. that the bed days which could be freed up can be computed from current lengths of stay of elective inpatients having those procedures.

**Figure 7.3:** Estimated Impact of additional Day Surgery on Bed Need

<b>Step 1</b>	Identification of the proportion of each procedure of the AC / BADS 'Trolley' carried out as day cases in Ireland in 2000 (Appendix III)
<b>Step 2</b>	Comparison of the proportion carried out as day cases in Ireland with the UK benchmark proportion for each procedure (Appendix III)
<b>Step 3</b>	Estimation of the number of inpatient procedures which could be transferred to day if the UK benchmarks applied in Ireland (n = 11,692) (Appendix III)
<b>Step 4</b>	Estimation of the number of inpatient bed days which could be made available, using the ALOS for elective inpatients for each procedure ( <i>Technical Report</i> <sup>see p.14</sup> )
<b>Estimate of Impact</b>	<b>Approximately 36,700 bed days could be made available</b>

The results of Steps 1 to 4 for each procedure of the AC and BADS are given in Appendix III. Table 7.4 summarises the findings by surgical specialty.

**Table 7.4:** Potential to Increase Day Surgery and Inpatient Bed Days gained by specialty

Specialty	Elective Patients 2000	Treated as Day Cases	Additional Day Cases possible*	Estimated Bed Days made available	Estimated Beds made available
General Surgery	15,872	6,440 (41%)	3,143	11,001	30
Urology	14,012	9,944 (71%)	977	5,247	14
Orthopaedic Surgery	5,774	3,722 (64%)	710	1,589	4
Ophthalmology	10,430	5,333 (51%)	3,649	8,991	25
ENT	6,772	4,723 (70%)	752	2,477	7
Gynaecology	8,811	4,359 (49%)	2,461	7,402	20
TOTAL	61,671	34,521 (56%)	11,692	36,707	100

\*Using UK benchmark proportions for each procedure

Of the 39 procedure types included in this analysis, it is estimated that an additional 11,692 day cases could be performed in Ireland based on the UK benchmark proportions. The consequences of this are as follows:

- estimated 36,707 bed days made available;
- estimated 100 beds made available;
- the proportion of these elective surgical procedures carried out as day cases increased from 56% to 75%.

The largest contribution accrues from General Surgery (30%), followed by Ophthalmology (25%) and Gynaecology (20%). Clearly, these proportions are influenced to some degree by the procedures included in this analysis. Nonetheless, it points to the potential for increasing day work in these specialties.

This analysis has identified that 75% of the *elective* surgical procedures analysed could be done on a day basis. If this proportion applied to all *elective* surgical procedures in Ireland the results would be as follows:

- approximately 35,000 additional day procedures would be performed annually;
- approximately 105,000 bed days could be made available (based on median LOS for elective surgical inpatients of 3 days);
- approximately 290 inpatient beds could be made available; and
- a minimum of 150 additional day beds would be required.

The transfer of this significant number of *elective* surgical procedures from inpatient to day surgery would necessitate significant investment in day surgery facilities and resources. Based on the assumption that each patient requiring day surgery occupies a day bed each working day, this would necessitate a minimum of 150 additional day beds.

## Conclusion

On the basis of the above data it is evident that there is scope for additional increase in day activity in Ireland over and above that which will occur due to increased demand and advances in medical technology. Many new day surgery episodes represent additional activity rather than substitution for inpatients. A priority therefore must now be to achieve transfer of inpatient surgery to day surgery, so that resources can be released for other inpatient surgery. A national target of 75% of *elective* surgery to be performed on a day basis should be considered.

## 7.5 Improved Management of Private Beds in Public Hospitals

### Context

Under the present arrangements, 80 per cent of beds in acute hospitals may be designated as public while 20 per cent may be private. In general, this ratio is operating reasonably well in the case of emergency admissions. The position regarding elective (planned or non-emergency) admissions is less satisfactory.<sup>2</sup> The concern is that treatment of elective private patients in public hospitals is contributing to extended waiting times for some public patients.

In the context of estimating the need for additional bed capacity in public hospitals, it therefore seems appropriate to estimate the number of beds which could be made available for use by public patients by strict adherence to an 80/20 ratio of public and private beds.

### Estimation of Impact on Bed Need

This estimation is based on the assumption that the 80/20 ratio of public and private beds exists throughout the acute public hospital system.

Data on the eligibility status (i.e. public or private) of patients are available in the HIPE database. While the proportions of patients who are public and private is informative, the proportions of *bed days used* by elective public and private patients is more useful for this exercise. The steps to estimation of impact are outlined below:

**Figure 7.4: Estimated Impact of adherence to an 80/20 ratio of Public/Private beds on Bed Need**

<b>Step 1</b>	Public/Private status of emergency and elective inpatients in public hospitals extracted from HIPE data 2000		
		Public	Private
	Emergency	79%	21%
	Elective	70%	30%
<b>Step 2</b>	Bed days used by <i>elective</i> public and private inpatients in public hospitals (excluding hospitals with no private patients and excluding maternity hospitals)		
		Public	Private
	Bed days used N	596,920	220,645
	%	73%	27%
<b>Step 3</b>	Additional bed days which could be made available to public patients if 80/20 ratio applied = 57,132 (Details in <i>Technical Report</i> <sup>see p.14</sup> )		
<b>Estimate of Impact</b>	<b>Approximately 160 beds could be made available</b>		

### Conclusion

Approximately 160 beds could be made available for use by elective public patients by strict adherence to an 80/20 ratio of public/private beds in public hospitals.

## 7.6 Reformed Structure and Functioning of Primary Care

### Context

A significant programme of change aimed at strengthening the structure and functioning of Primary Care in Ireland has been proposed in *Primary Care: A New Direction* as part of the new Health Strategy.<sup>59</sup> Experience from elsewhere would suggest that significant enhancements to Primary Care services initially result in an increase in the demand for acute hospital services. This may be due to identification of previously unmet need and need for specialist services in the population. Ultimately it is expected that the need for acute hospital services would be reduced by enhanced Primary Care.

### Estimated Impact on Bed Need

The impact that the proposed changes to Primary Care may have on the need for additional acute hospital facilities are difficult to quantify. The following data would be required:

- the proportion of A&E attendees who go to A&E as their first option, but who could be treated by their GP;
- the proportion of A&E attendees who could be treated by their GP but to whom GP services are not available when needed;
- the proportion of A&E attendees who are referred there by their GP and the conditions with which they are referred; and
- the proportion of A&E attendees who could not be treated by their GP.

In addition, it would be desirable to know the need that GP's have for other hospital services e.g. outpatient appointments, diagnostic tests, minor procedures and treatment services. With data of this nature, planning for the relocation of certain diagnostic and therapeutic functions to Primary Care could get under way.

### Conclusion

For the purposes of this Review it is not possible to make any adjustment at this time to the estimated number of acute hospital beds required on the basis of anticipated changes in Primary Care.

## 7.7 Measures to Reduce Emergency Admissions to Acute Hospitals

### Context

The proportion of inpatients admitted through A&E departments currently runs at 71%. This has increased from 67% in 1995. As outlined in Section 3, emergency admissions are predominantly older patients with medical conditions: of medical inpatients 82% are admitted as emergency. This compares with 37% of surgical inpatients admitted through A&E. Measures to ensure appropriateness of admission from A&E have been called for.

### Reforming A&E

A substantial programme of improvements in A&E departments is planned under the Health Strategy.<sup>2</sup> Significant initiatives will be taken to improve the operation of A&E departments by directing patients to the most appropriate forms of care and ensuring those that need treatment are seen as quickly as possible. These include:

- additional A&E consultants to be appointed to facilitate rapid clinical decision making;
- triage procedures to be put in place;
- minor injury units to be established to facilitate treatment of non-urgent patients;
- chest pain clinics and respiratory clinics to be established;
- diagnostic services to be organised to ensure increased access;
- advanced nurse practitioners to be appointed; and
- information systems to be developed.

### Estimated Impact on Bed Need

Quantifying the impact of these combined measures on emergency admissions and, therefore, on the need for acute hospital beds is difficult. For the purposes of this Review, it is not possible to make any adjustment at this time to the estimated need for acute hospital beds on the basis of the planned developments in A&E departments.

## SECTION 8

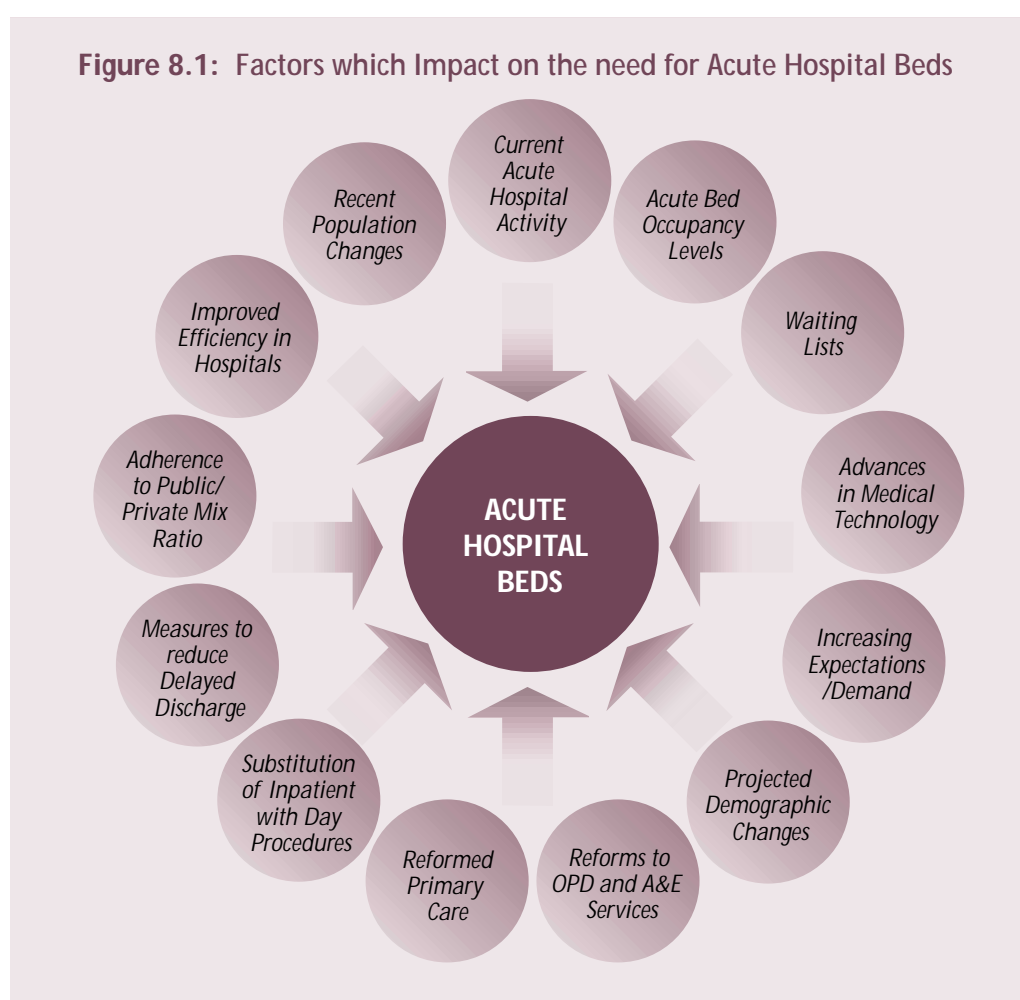
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# Estimating National Bed Need



In so far as possible, *data* on potential determinants of acute hospital bed need in Ireland have been collated from available sources. Some data upon which estimates have been made are provisional at this time, such as the population estimates for 2000. These cannot be confirmed until the next census takes place. *Assumptions* made in relation to individual determinants have been outlined. Determinants of bed requirement have been treated in what would appear to be a logical sequence. No analytical model is likely to capture all of the real life factors which contribute to such a complex issue. Some factors are readily identifiable and quantifiable; others are not.

The *impact* of each factor is presented in terms of the number of beds 'required' or made available. This 'univariate' approach to analysis has both strengths and limitations. Its strength is that it shows the relative importance of individual determinants on the need for additional hospital beds. Its limitation is that many of the factors identified in this review, and profiled in Figure. 8.1, operate simultaneously and interactively in a complex manner which is difficult to model.



In so far as is possible numerical estimates of beds needed or made available have been derived. The results are presented in Table 8.1. The *gross estimate* of additional bed need takes account of those difficulties in the hospital system which require immediate attention (occupancy levels and waiting lists) and factors which will increase the need for beds in the future (demographic changes and demand). The *net estimate* assumes parallel investment in strategies aimed at reducing the need for acute hospital beds. These include additional community support services and facilities to allow for timely discharge of patients to more appropriate settings, additional day facilities to allow for substitution of inpatient with day surgery and improved management of existing bed stock.

**Table 8.1:** Additional Acute Hospital Beds Required in Ireland to 2011

<b>Acute Hospital Bed Complement in 2000</b>	<b>11,832</b>
<b>Current Indicators of Inadequate Bed Capacity</b>	
Additional beds required to reduce average bed occupancy in major hospitals	883*
Additional beds required to facilitate treatment of Waiting List patients	492*
<b>Factors which will Increase the Need for Acute Beds</b>	
Additional beds required due to projected demographic changes	1,630*
Additional beds required to cope with increased demand for healthcare	1,330†
<b>Additional Inpatient Beds Required (Gross Estimate)</b>	<b>4,335</b>
<b>Strategies with the Potential to Reduce Need for Additional Beds</b>	
Investment in measures to reduce delayed discharge from acute hospitals	675
Potential use of available capacity in some hospitals	200
Substitution of elective inpatient surgery with day surgery	290
Treatment of one-third of waiting list patients on a day basis	170
Improved management of public and private beds for elective patients	160
<b>Potential Capacity within the Existing System</b>	<b>1,495</b>
<b>Additional Inpatient Beds Required (Net Estimate)</b>	<b>2,840</b>
<b>Additional days beds Required (in addition to net estimate)</b>	<b>190</b>

\* Adjusted for 85% occupancy

† Application of the estimate of demand to existing bed complement corrected for occupancy

Correction of current high occupancy levels in major hospitals accounts for 20% of the estimated gross need; Waiting Lists account for approximately 11%. By far the greatest need will be incurred by projected demographic changes (38%) and by increasing demand for healthcare (31%). Among the strategies with the potential to reduce the need for additional beds, investment in measures to reduce delayed discharge from acute hospitals would have the greatest impact. This alone could 'provide' 16% of the capacity required. Investment in day facilities, and a substantial shift of elective inpatient surgery to day surgery, could reduce the need for additional beds by 11%. Strict adherence to an 80/20 ratio of public and private beds for elective patients, has the potential to contribute 4% of the need identified. The potential to use available capacity in some hospitals could provide a further 5% of the need.

It is essential to record that combined implementation of all of these strategies will not resolve the current capacity deficit. It could provide up to one-third of beds needed. However, at least two-thirds of the required capacity must be added to the system, in conjunction with significant parallel investment in the strategies outlined.



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# Appendices



## Appendix I

Figure 3.1: A&E Attendances and % of A&E Attendees admitted, 1995 to 2000

A&E	1995	1996	1997	1998	1999	2000
Attendances	1,199,452	1,193,777	1,213,321	1,242,343	1,229,303	1,202,635
% Admitted	24.3	24.6	24.5	24.3	24.9	26.1

Figure 3.2: Total Admissions, excluding Obstetric Patients, 1995 to 2000

Admissions	1995	1996	1997	1998	1999	2000
Number	594,620	625,690	639,635	656,314	676,854	711,694
Rate/1,000	165.1	172.5	174.7	177.1	180.7	187.9

Figure 3.3: Inpatients Discharged, excluding Obstetric Inpatients, 1995 to 2000

Inpatients	1995	1996	1997	1998	1999	2000
Number	433,216	435,131	433,459	431,181	430,932	441,117
Rate/1,000	120.3	120.0	118.4	116.4	115.0	116.5

Figure 3.5: Bed Days Used and Average Length of Stay, excluding Obstetric Inpatients, 1995 to 2000

Inpatients	1995	1996	1997	1998	1999	2000
Bed Days Used	3,124,128	3,048,817	2,992,141	3,021,412	2,998,626	3,033,428
Inpatients	433,216	435,131	433,459	431,181	430,932	441,117
ALOS	7.21	7.01	6.90	7.01	6.96	6.88

Figure 3.6: Day Cases, excluding Obstetric Day Cases, 1995 to 2000

Day Cases	1995	1996	1997	1998	1999	2000
Number	161,404	190,559	206,176	225,133	245,922	270,577
Rate/1,000	44.8	52.5	56.3	60.8	65.7	71.4

Figure 3.7: % Treated as Day Cases, excluding Obstetric Day Cases, 1995 to 2000

Day Cases	1995	1996	1997	1998	1999	2000
% of All Patients	27.1	30.5	32.2	34.3	36.3	38.0
% of Elective Patients	53.2	57.5	60.2	63.5	66.4	68.1

Figure 3.8: Outpatient Attendances: Numbers and Rates/1,000 Population, 1995 to 2000

OPD	1995	1996	1997	1998	1999	2000
Attendances	1,890,702	1,901,292	1,928,734	1,963,504	1,930,942	2,006,332
Rate/1,000	525	524	527	530	516	530

Figure 3.9: Medicine vs Surgery: Total Admissions, excluding Obstetric Patients, 1995 to 2000

Admissions	1995	1996	1997	1998	1999	2000
Medical (N)	428,803	452,497	465,361	483,216	501,482	527,650
Surgical (N)	165,817	173,193	174,274	173,098	175,372	184,044

Figure 3.10: Medicine vs Surgery: Inpatients Discharged, excluding Obstetric Inpatients, 1995 to 2000

Inpatients	1995	1996	1997	1998	1999	2000
Medical (N)	315,765	316,504	317,028	319,552	322,166	328,566
Surgical (N)	117,451	118,627	116,431	111,629	108,766	112,551

Figure 3.11: Medicine vs Surgery: % of Inpatients, excluding Obstetric Inpatients, admitted as Emergencies, 1995 to 2000

Inpatients	1995	1996	1997	1998	1999	2000
Medical	80.0	80.4	80.8	81.6	82.5	82.8
Surgical	32.6	33.5	35.2	36.8	37.5	37.4

Figure 3.12: Medicine vs Surgery: Bed Days Used and Average Length of Stay, excluding Obstetric Inpatients, 1995 to 2000

Inpatients	1995	1996	1997	1998	1999	2000
<b>Bed Days Used</b>						
Medical	2,215,480	2,153,622	2,118,420	2,153,753	2,172,913	2,196,840
Surgical	908,648	895,195	873,721	867,659	825,713	836,588
<b>ALOS</b>						
Medical	7.02	6.80	6.68	6.74	6.74	6.69
Surgical	7.74	7.54	7.50	7.77	7.59	7.43

Figure 3.13: Medicine vs Surgery: Day Cases excluding Obstetric Day Cases, 1995 to 2000

Day Cases	1995	1996	1997	1998	1999	2000
Medical (N)	113,038	135,993	148,333	163,664	179,316	199,084
Surgical (N)	48,366	54,566	57,843	61,469	66,606	71,493

Figure 3.14: Medicine vs Surgery: Proportions of all Patients and of Elective Patients treated as Day Cases, 1995 to 2000

Day Cases	1995	1996	1997	1998	1999	2000
<b>% of All Patients</b>						
Medical	26.4	30.1	31.9	33.9	35.8	37.7
Surgical	29.2	31.5	33.2	35.5	38.0	38.8
<b>% of Elective Patients</b>						
Medical	64.2	68.7	70.9	73.6	76.1	77.9
Surgical	37.9	40.9	43.4	46.5	49.5	50.4

Figure 3.15: Medicine vs Surgery: Bed Designations vs Clinical Activity

Clinical Category	Bed Designations		Bed Days Used	
	N	%	N	%
Medical	4,590	51	1,896,496	71
Surgical	4,417	49	782,548	29
Total	9,007	100	2,379,044	100

## Appendix II

Figure 4.1: Age-specific Distributions of Inpatients Discharged, 2000

Inpatients	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Number	50,174	32,800	64,953	82,872	55,201	46,387	49,761	63,220	58,910	18,598	522,876
Rate/1,000	189.3	58.6	94.8	145.3	105.1	100.5	154.8	265.0	409.7	446.0	138.1

Figure 4.2: Age-specific Rates of Medical and Surgical Inpatients Discharged, 2000

Rate/1,000	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Medical	171.5	42.8	72.5	108.2	71.9	69.5	113.1	201.8	325.0	365.6	104.4
Surgical	17.7	15.8	25.9	37.1	33.2	31.0	41.6	63.2	84.7	80.4	33.7

Figure 4.3: Proportion of Inpatients in each age category admitted as Emergencies, 2000

%	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Total	87.6	76.1	77.0	72.8	67.2	61.8	62.0	65.7	73.0	80.9	71.8
Medical	93.1	88.5	84.6	79.2	78.7	76	74.2	76.5	82.3	87.3	81.6
Surgical	34.2	42.4	55.6	54.2	42.3	30.1	28.9	31.2	37.4	51.7	41.5

Figure 4.4: Age-specific Average Length of Stay of Inpatients Discharged, 2000

ALOS	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Total	4.1	2.9	3.6	3.9	4.7	6.4	7.8	9.6	11.4	13.2	6.3
Emergency	4.0	2.7	3.4	3.7	4.7	6.5	8.1	9.8	11.1	12.1	6.2
Elective	4.9	3.3	4.3	4.2	4.7	6.2	7.2	9.2	11.9	17.5	6.8

Figure 4.5: Age-specific Distributions of Inpatient Bed Days Used, 2000

Bed Days Used	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
N x 1,000	2,064	937	2,363	3,200	2,584	2,959	3,861	6,083	6,687	2,446	33,184
Rate/1,000	778.6	167.5	358.0	561.0	492.0	641.1	1200.9	2549.5	4650.4	5866.2	876.3

Figure 4.6: Age-specific Distributions of Bed Days Used by Medical and Surgical Inpatients, 2000

Rate/1,000	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Medical	682.9	117.2	245.3	375.8	310.7	416.3	813.5	1835.9	3626.1	4838.9	634.0
Surgical	95.6	50.3	112.7	185.2	181.3	224.7	387.4	713.6	1024.2	1027.3	242.3

Figure 4.8: Age-specific Distributions of Day Cases, 2000

Day Cases	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Number	12,977	15,508	22,436	29,546	38,409	45,266	44,348	39,739	21,222	3,827	273,278
Rate/1,000	49.0	27.7	34.0	51.8	73.1	98.1	137.9	166.6	147.6	91.8	72.2

Figure 4.9: Age-specific Rates of Medical and Surgical Day Cases, 2000

Rate/1,000	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Medical	28.6	14.2	21.5	33.8	52.3	77.4	116.8	139.7	111.2	58.9	53.2
Surgical	20.3	13.5	12.5	18.0	20.8	20.7	21.1	26.9	36.4	32.9	18.9

Figure 4.10: Age-specific Proportions of Elective Patients treated as Day Cases, 2000

%	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Total	67.5	66.4	60.0	56.8	68.0	71.9	70.1	64.7	57.1	51.9	65.0
Medical	70.7	74.3	65.8	60.1	77.4	82.2	80.0	74.7	65.8	56.0	73.5
Surgical	63.5	59.7	52.1	51.4	52.1	48.8	41.6	38.2	40.7	45.8	49.0

## Appendix III

**Benchmarking day surgery: Elective operations in Ireland in 2000, the number and % done on a day basis, the UK benchmark % for each procedure and estimation of additional day surgery possible in Ireland.**

Procedure	ICD Codes	Elective Operations in Ireland, 2000	Done on a Day Basis N	%	UK Benchmark %	Estimated Additional Day Cases*
<b>General Surgery</b>						
Inguinal hernia repair	53.0-1	3,718	899	24%	46%	811
Excision of breast lump	85.11-9, 85.20-1	3,753	2,845	76%	69%	
Anal fissure excision	49.31, 49.39	151	101	67%	74%	11
Varicose vein stripping or ligation	38.50-9	3,606	1,203	33%	60%	961
Laparoscopic cholecystectomy	51.23	2,442	86	4%	50%	1,135
Thoracoscopic sympathectomy	05.22-3	34	2	6%	50%	15
Breast cancer wide excision	85.22, 85.23	348	18	7%	50%	156
Haemorrhoidectomy	49.4	1,677	1,268	76%	50%	
Subcutaneous mastectomy	85.3	143	18	13%	50%	54
Sub Total		15,872	6,440	41%		3,142
<b>Urology</b>						
Cystoscopy	57.31-9	9,589	7,765	81%	79%	
Circumcision	64.0	2,358	1,798	76%	82%	136
Orchidopexy	62.5	613	365	60%	81%	132
Urethrotomy	58.0	30	6	20%	50%	9
Bladder neck incision	57.91	63	3	5%	50%	29
Laser prostatectomy	60.2	1,359	7	1%	50%	673
Sub Total		14,012	9,944	71%		977
<b>Orthopaedic Surgery</b>						
Dupuytren's contracture excision	82.12, 82.35	312	41	13%	45%	99
Carpal tunnel decompression	04.43-9	837	479	57%	91%	283
Arthroscopy	80.20-9	2,793	1,964	70%	76%	159
Excision of ganglion	82.21-9, 83.31-9	513	403	79%	92%	69
Hallux valgus	77.51-3	173	46	27%	50%	41
Arthroscopic meniscectomy	80.6	1,024	788	77%	50%	
Arthroscopic shoulder surgery	81.82	122	1	1%	50%	60
Sub Total		5,774	3,722	64%		710
<b>Ophthalmology</b>						
Cataract extraction	13.11-72	6,969	2,407	35%	85%	3,517
Correction of squint	15.11-99	249	69	28%	81%	133
Eyelid surgery	08.0-9	3,212	2,857	89%	50%	
Sub Total		10,430	5,333	51%		3,649
<b>ENT</b>						
Myringotomy	20.01-9	4,067	3,588	88%	91%	113
Submucous resection	21.5	154	10	7%	23%	25
Reduction of nasal fracture	21.71-9	891	768	86%	91%	43
Operation for bat ears	18.5	278	118	43%	73%	85
Submandibular gland excision	26.0-26.9	317	75	24%	50%	84
Superficial parotidectomy						
Partial thyroidectomy	06.2, 06.3	347	4	1%	50%	170
Rhinoplasty	21.84-7	214	14	7%	50%	93
Dentoalveolar surgery	24.0-8	194	131	68%	50%	
Tympanoplasty	19.4-6	310	15	5%	50%	140
Sub Total		6,772	4,723	70%		752
<b>Gynaecology</b>						
Dilatation and curettage	69.01-9	4,993	3,051	61%	80%	943
Laparoscopy / sterilisation	54.21	2,864	1,304	46%	82%	1,044
Transcervical resection endometrium	68.5	954	4	0%	50%	473
Sub Total		8,811	4,359	49%		2,461
<b>GRAND TOTAL</b>		<b>61,671</b>	<b>34,521</b>	<b>56%</b>		<b>11,692</b>

\*Minor inconsistencies in totals are due to "rounding" of proportions of elective operations done as day cases.



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