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PROJECTING THE IMPACT OF DEMOGRAPHIC CHANGE ON THE DEMAND FOR AND DELIVERY OF HEALTH CARE IN IRELAND

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EXECUTIVE SUMMARY

Introduction

The size and make-up of the Irish population has changed in important ways over the last two decades and these trends look set to continue. Such 'demographic' trends have implications for almost all areas of Irish life but health and health care are particularly sensitive to the make-up of the population. Effective planning for the consequences of these trends will be crucial in determining how successful we are in coping with the associated challenges. This report is the first attempt to tease out and quantify the impact of demographic change on the demand for and delivery of health care in Ireland.

As in most other affluent nations, life expectancy in Ireland has been increasing strongly in recent decades. This is to be celebrated and attests to real improvements in Irish society. Nonetheless, older people require both more health care, on average, than younger people and a different combination of services. Population ageing is not the only demographic challenge we face however. Recent inward migration combined with improvements in life expectancy mean that Ireland simply has a significantly larger population and this will exert increasing pressure on Irish health care resources. The recent downturn in Irish economic fortunes will weaken migration over the next decade or so but population enlargement would occur even if migration halted all together. When combined these factors point to the need for significant reconfiguration of health care as well as an increase in overall resources.

Since the economic outlook in Ireland over the medium term is not conducive to substantial additional investment in health care, we need to look closely at current practices. Delivering more and better services with the same resources requires strategic planning and substantial reorganisation. This planning requires hard numbers on the current delivery of services in different areas and the likely impact of demographic change. This is the task of this report, the last in a series of three commissioned by the Health Research Board (HRB) and Health Services Executive (HSE) on the impact of demographic change on the demand for and delivery of health care in Ireland to 2021. As well as producing evidence on the current delivery of health care and future requirements, we also suggest possible policy responses. Some of these deal with increasing the supply of particular professionals. For example, Chapter 3 examines the training requirement and retention of new GPs. Others deal with specific changes in the delivery of care, such as the reconfiguration of acute care in Irish hospitals (Chapter 2).

The need across Irish health care for detailed population and health care projections means that this report contains a large amount of technical detail and analysis. Factors other than demography, such as the health of the population, technical change and health policy, also play a role and these further complicate the analysis. Hopefully, this unavoidable detail will not distract the reader from the basic fact that

substantial population ageing and population growth in Ireland is inevitable. Planning effectively for these developments will have positive long-term consequences for the health and well-being of Irish people.

Patterns of health care utilisation are the outcome of a complex interplay of factors. While the primary objective of this project was the analysis of the impact of demographic change, we also take into account a large number of additional factors that influence the demand for and supply of health care:

- ***Overall population health***: trends in acute illness and levels of disability are crucial. We develop epidemiological projections of future health.
- ***Technological change in health care***: this has been important in the past in creating efficiencies in Irish health care and will continue to be important in the future. Technological change is hard to predict but we use past trends to estimate possible impacts.
- ***Changing demand***: improvements in standards of living may increase the demand for care. Increasing health care costs may have the opposite effect. We examine past trends to estimate future developments.
- ***The availability and supply of care***: current patterns of utilisation may be 'supply constrained' by available facilities, staff and capacity and there may be substantial latent demand. We use international comparisons of care provision to sensitise the analyses.
- ***Health care policy:*** current policy documents from the Department of Health and Children and the Health Services Executive set out strategic reforms for health care in Ireland. We examine the interaction of demographic and epidemiological trends with these plans.

Demographic Trends for Ireland to 2021

Population change is the outcome of three processes: fertility, mortality and net migration and each has important implications for the provision of health services. This project developed new population projections based on census data, mortality and birth trends and the ESRI's *HERMES* model of the Irish economy.

FERTILITY AND BIRTHS

- Ireland's fertility rate peaked in 1965 at 4.03 but remained high until 1980 after which it declined markedly and has been below replacement (2.1) since 1991. Rates did rise again in the mid-1990s but have been declining again since 2003 and there is a clear long-term downward trend. This fertility decline is most marked among women aged 20-29, but has been compensated for, to some extent, by increasing fertility among women aged 30 to 39.

- Fertility rates in Western and Northern counties have been consistently lower than in other counties in recent decades. On the other hand, population growth among particular age groups in commuter counties around large cities and Dublin in particular has led to higher rates of fertility in these areas. The movement of child bearing age groups out from the cities has meant that they tend to have lower fertility rates.

- The central projection of the project assumes an initial increase in births to 2014 followed by a decline to 2021, meaning that births fall from 64,237 in 2006 to 58,400 in 2021.

MORTALITY AND DEATHS

- The absolute number of deaths occurring in the state has been declining since the early 1990s, with a sharp fall in deaths after 1999. With population growth this has led to an overall decrease in the death rate from 9 per 1,000 in 1991 to 6.6 per 1,000 in 2005. For men life expectancy has risen from 71 in 1986 to 76.8 in 2006. Women's life expectancy has increased from 76.8 in 1986 to 81.6 in 2006.

- Age specific mortality rates have improved dramatically, particularly among older age groups. Crude death rates are higher in Northern and Western counties. Our projection assumes that the rate of improvement in mortality will slow down to a long-run average rate of 1.5 per cent.

MIGRATION

The change in the pattern of migration over the last 15 years has been remarkable. Inward migration trebled between 1996 and 2006 from 40,000 to 122,000 with the proportion of migrants with no previous connection to Ireland increasing substantially, particularly in the final two years of that period.

- Recent migrants to Ireland are predominantly in the 20 to 34 year age group and those with no previous connection to Ireland are less likely to travel with children than returning Irish people or those moving within the country although patterns differ by country of origin.

- Our central projection assumes that economic factors and changes in the pattern of European mobility will lead to a decrease in the number of migrants between 2006 and 2021. Recent economic shocks have seen immigration fall precipitously but we project immigration to converge with the projected downward trend by 2014.

PROJECTED OVERALL POPULATION CHANGE

- The central demographic projection estimates that the population will grow overall from 4.24 million in 2006 to 5.1 million in 2021 assuming positive but decreasing migration, with growth rates highest in the first 5 years of the projection (2.3 per cent). If migration falls to zero early in the projection horizon, population growth will moderate to 4.71 million.

- Overall population growth is projected to vary across counties with Dublin's increasing least (8 per cent) due to outward population movement, particularly among young, fertile groups. On the other hand, Meath, Laois, Cavan and Wexford are expected to have growth rates of 61 per cent, 48 per cent, 44 per cent and 39 per cent respectively.

- Significant population ageing will occur with the proportion aged under 5 years projected to fall absolutely (by 32,000) and relatively (by 1.2 per cent). Those aged 65+ will increase from 11 per cent to 15.4 per cent of the population, with those aged 85+ increasing from 1.1 per cent to 2.1 per cent which represents an absolute increase of 42,900 individuals. The fall in the proportion of younger age groups will be most pronounced in Western and Southern counties.

- Population ageing combined with previous trends towards living independently will mean average household size will fall to 2.45 by 2021. With an increasing proportion of men surviving into older age, the proportion of women living alone in older age will actually decrease over our projection horizon as more couples remain intact.

Acute Public Hospital Services: Challenges for Reform in the Context of the 'Preferred Health System'

- In its Transformation Programme, the Health Service Executive (HSE) committed to the development of the "integrated health system" (IHS) to be achieved through a redirection of health services from acute hospitals to primary and community care. The view that community-delivered care represents better value for money with the potential for better quality of care for patients is a key driver for this policy objective.

- The PA Consulting Group was commissioned by the HSE to estimate acute hospital bed capacity requirements for Ireland for 2020. When estimated on the basis of current utilisation patterns, this Report estimated that 19,822 public patient hospital beds will be required by 2020 while the projections based on the HSE's Integrated (or Preferred) Health System model estimate that just 8,834 public patient beds will be required by 2020. Over three-quarters of the savings in public patient bed numbers between the two models have been attributed to the proposed reduction in in-patient length of stay and increasing day case activity.

- The analysis presented in this report focused on issues arising with the achievement of the objectives of increasing day case activity together with reducing average length of stay given the critical part these assumptions make to the public patient bed projections proposed by PA Consulting for the PHS (Preferred Health System) model by 2020.

OVERVIEW OF DAY CASE ACTIVITY IN ACUTE PUBLIC HOSPITALS

- The analysis of day case activity relative to available capacity at the hospital level and at the level of specific procedures found high levels of variation in day case rates across hospitals with similar proportions of day beds. The achievement of national objectives in relation to day case rates may therefore need to adopt a more targeted intervention where the rates for individual hospitals are lower than would be expected given the capacity available.

- The day case rates for the individual procedures in the internationally-recognised Basket 24 (adapted for Ireland) were reviewed and shown to vary across the hospitals in which they were

performed. If all hospitals in 2006 were delivering the Basket 24 procedures at the upper quartile day case rate, the number of day cases, in place of elective in-patient cases, would have been 15.2 per cent (8,926 cases) greater than that actually achieved in 2006. The savings varied between procedures with 'cataracts' procedures allowing for the greatest scope in the reduction of elective in-patient cases and consequently beds days.

- While the evidence presented in this report supports the assumption that there is potential to increase day case activity as part of the PHS model, the findings indicate that the achievement of the proposed targets may necessitate customisation of this policy for individual hospitals and for specific procedures.

REVIEW OF ACUTE INPATIENT LENGTH OF STAY

- The potential to reduce in-patient average length of stay was assessed from the perspective of demand and supply. On the demand side, the top 10 per cent of discharges used almost 50 per cent of in-patient bed days. These discharges, the so called high users, were older and sicker than other users. The high users were being treated for more complex conditions which were often associated with chronic conditions. While treatment in other care settings may be equally or more appropriate for many in this group, this analysis would suggest that an attempt to reduce bed day utilisation within the acute public hospital sector will have to ensure that an appropriate response to the needs of this potentially vulnerable group are specifically addressed.

- When variations in average length of stay for specific procedures were assessed, it became evident that many hospitals were achieving, or surpassing, the 2020 targets in 2006. There was, however, substantial variation by procedure and by hospital suggesting that optimisation of progress towards the achievement of the 2020 targets at the hospital system level may benefit from a performance management approach focussed on specific procedures and individual hospitals.

- On the supply side, there is considerable variation in average length of stay across hospitals and hospital groups. Controlling for discharge characteristics, the mean standardised length of stay for voluntary and special hospitals was higher than expected while that for regional and community hospitals was lower than expected.

- While there are undoubtedly benefits to an integrated model of health care provision as proposed by the HSE, reducing the over-reliance on hospitals inherent in the Irish health care system will be a challenge. The variation observed in the volume and mix of day case rates indicates that any national policy aimed at increasing day service rates will have to be targeted at individual hospitals and specific procedures. With regard to average length of stay, the variation in length of stay observed by hospital type, together with the fact that many of the so called 'high users' are elderly, medical card holders suffering from multiple morbidity/chronic conditions is indicative of the complexity faced in attempting to address this issue.

General Practitioner Care

PROJECTING GP UTILISATION

- Analyses show that the overall rate of GP visiting did not change between 1994 and 2001 with the average person having 3.5 visits in 1994 and 3.3 visits in 2001 (this was also unchanged from the late 1980s).

- The average number of GP visits among women is higher than among men in each age group, a pattern which has been repeatedly observed across a number of countries and contexts. Analysis shows a steep increase in visitation rates by age, particularly for men. Men in the group aged 81+, have almost six times the number of GP consultations as men in the youngest age group. The increase is not so steep among women, but even here, the oldest age group have almost twice the number of visits as the youngest age group.

- As the older age groups are heavier users of GP services, the change in population composition over the projection horizon will influence both the total number of consultations and the age composition of these consultations. Based on the 2001 consultation rates by age and sex groups there were 11.2 million consultations for the population aged 16 years or more in 2006 (visitation rates are not available after 2001).

- Due to demographic change the total number of consultations is projected to increase to 12.2 million by 2010, 13.4 million by 2015 and to 14.8 million by 2021. This represents a 20 per cent increase by 2015 and a 33 per cent increase by 2021.

- There is a very pronounced difference in the rate of growth in consultations between men and women over the projection horizon with the former increasing by 40 per cent compared to 28 per cent among the latter. This stems from the larger increase in the numbers of men over the period and the steeper increase in consultation rates among older men.

- The pronounced gradient in number of GP consultations a year across age groups and the higher level of increase in the number of older people in the population will lead to a redistribution of the pattern of consultations across the age groups. Among the three youngest age groups we see decreases in the proportion of total consultations whereas the proportion increases among older age groups. The proportion of consultations for those aged 71+ increase from 18.3 to 23.8 per cent, an increase of 5.5 per cent.

COUNTY LEVEL CHANGE IN GP CONSULTATIONS

- All counties except Dublin are projected to experience an increase in total population between 2006 and 2021. The rates of growth vary significantly across counties with Meath, Laois, Cavan and Wexford projected to have particularly strong rates of growth whereas Limerick, Sligo and Kerry sit at the other end of the table with lower, albeit positive growth rates.

- These differences clearly have implications for the projection of the volume of GP consultations. Meath and Laois are projected to

experience the largest growth in consultations at 73 and 58 per cent respectively. At the other end of the spectrum, Dublin, Sligo and Kerry are projected to experience the lowest increases in total consultations by 2021, but even here, the projection is for their levels to increase by 19.6, 23.9 and 25.4 per cent respectively.

- The lower level of total consultations in these counties stems partly from lower levels of increase among the older age groups (although even here rates of increase are between 50 and 100 per cent), but mostly because of lower levels of increase among younger age groups.

CHANGE IN GP CONSULTATIONS BY HSE REGION

- The populations of the four HSE regions are all projected to increase substantially between 2006 and 2021 but the rate of increase varies substantially. Dublin Mid-Leinster is predicted to experience the lowest rate of population growth over the period at 19 per cent followed by the Western region (24 per cent) and Southern (25 per cent). Dublin North-East is predicted to experience the highest rate of population growth at 28 per cent. These population dynamics will have implications for growth in GP consultations with Dublin North-East experiencing the highest increase at 38 per cent followed by the Western region at 32 per cent, Southern at 33 per cent and Dublin Mid-Leinster at 29 per cent.

THE SUPPLY OF GPS IN THE REPUBLIC OF IRELAND FROM 2008 TO 2021

According to recent OECD data, Ireland has a very low ratio of GPs per 100,000 population compared to most other Western European nations. Ireland has 52 GPs/100,000; only the Netherlands has a marginally lower ratio, with several countries having over 100 GPs per 100,000 (namely France, Austria and Germany). Even when we adjust for Ireland's younger population profile, Ireland's ranking compared to other nations does not improve markedly.

The Age and Sex Distribution of Irish GPs

- The average age of GPs in 2005 was approximately 51 years, with rural areas having a higher average age. If not compensated for with new trainees, levels of retirement among GPs over the period to 2021 will create a substantial supply problem with knock-on effects for patient access.

- Women make up an increasingly large proportion of the GP workforce. Amongst GPs 30 per cent were women in 2005 up from 15 per cent in 1992 and 12 per cent in 1982. Female GPs are more likely to work part-time (20 per cent compared to 4 per cent for male GPs) so the increasing feminisation of the workforce is expected to impact on the number of GP Full-Time Equivalents (FTEs).

- Increasing feminisation may also decrease the average retirement age of GPs as female GPs have tended to retire earlier on average than male GPs. Even assuming all GPs retire at 65 years, over 350 GPs will retire between 2006 and 2010. The number retiring is projected

to grow to 450 between 2011 and 2015 and to over 500 between 2016 and 2020.

Current GP Supply Trends

- Given current recruitment and training and projected trends in population growth, retirement and feminisation, there will be a shortfall of approximately 300 GPs by 2021. If government immediately implemented professed policy and increased training to 150 GPs per annum this would meet GP requirement targets in 2021. If the target were for Ireland to increase the supply of GPs to the EU average there would be a shortfall of 1,800 GPs from this target by 2021. Increasing training to 150 per year would reduce this shortfall to 1,500 in 2021, assuming that all GPs trained in Ireland practice here (between 30 and 40 per cent of GPs trained in Ireland subsequently practice outside of the State for at least some of their career).

- If HSE policy of transferring patient care from acute hospitals to primary care services is to be realised, this will require an increase in GP numbers. A failure to expand GP supply, even if current acute hospital practices continue, would have knock-on effects which could include price increases, longer waiting lists and an increased burden on Emergency Departments in hospitals as patients seek alternative modes of care.

- The distribution of GPs across the county is not uniform and uneven trends in population growth and ageing will mean that Meath, Laois, Cavan and Wexford will experience severe shortages of GPs by 2021. Meath is projected to have 27 GP full-time equivalents per 100,000 population by 2021 with the rest of the in-land commuter counties in Leinster also particularly badly affected with ratios of less than 40.

- It is imperative that training places for GPs be increased in line with professed policy (150/year) and to 250/year if the PHS is implemented. Attention should be given to retaining GPs in Ireland once trained and attracting GPs from outside Ireland. Policy should also attempt to redistribute GPs to areas with the lowest population ratios and particularly to more deprived socio-economic areas which are underserved at present.

Outpatient Services

- Analysis shows that there was a 44 per cent increase in total volume of outpatient consultations between 2001 and 2006 in the old Eastern Region Health Authority Area. This increase is not uniform over age groups, however. Among those under the age of 18 years there has been an increase of 17 per cent in total consultations whereas among those aged 18 to 64 and 65+ years, the number has increased by 47 and 58 per cent respectively. These growth rates out pace population growth rates within age groups.

- Over the period there was a very substantial increase in the number of both consultant and non-consultant doctors within Irish hospitals. The former increased by 33 per cent from 1,574 to 2,096 and the latter by 25 per cent from 3,726 to 4,648 (DoHC, 2007)

between 2001 and 2006. At the same time there was a concerted effort by central government to decrease the significant waiting times being experienced for outpatient care and this translated into a pressure throughout the public hospital system to increase the number of clinics and the throughput within clinics.

- Given this, it could be that the large increase over the period is partly the result of a substantial increase in the supply of services rather than an increase in the demand. On the other hand, it could be that the large rise in consultations that occurred is simply an artefact of better data collection and reporting over the period. The National Hospitals Office acknowledge that data collection did improve over the period but cannot quantify the impact that this had.

PROJECTING OVERALL PUBLIC OUTPATIENT CONSULTATIONS

- Analysis shows that the average number of outpatient consultations among older age groups per capita is far higher than among younger age groups. The average number of consultations per year among those aged under 18 years in 2006 was 0.27 whereas this number increases to 0.75 among those aged 18 to 66 years and 0.96 among those aged 65+, almost four times the rate.

- The combination of higher utilisation rates among older age groups paired with a differential rates of increase at older age means that the rate of outpatient consultations is projected to increase by almost 25 per cent by 2021, 4 per cent higher than the population increase over the same period. The proportion of consultations among those aged under 18 years is projected to fall from 9.9 per cent of the total in 2006 to 8.9 per cent by 2021. Among the middle-aged group we also project a fall from 74 to 69 per cent. For those over the age of 65 years on the other hand, we project a substantial increase in the share of outpatient consultations from 16 to 22 per cent.

PROJECTING PUBLIC OUTPATIENT CONSULTATIONS BY HOSPITAL NETWORK

- Projecting the impact of regional demographic trends on outpatient care is complicated by the fact that a high proportion of outpatient consultations are carried out in hospitals which are not in the hospital network area in which the patient lives. This is especially true in the old Eastern Region Health Authority Area, essentially the large Dublin hospitals, where 48 per cent of total outpatient consultations are with patients from outside of the region.

- The proportion in other regions is not as large, although 'out of region' consultations in the old Western Health Board Area make up 42 per cent of the total work load. This complex pattern of referral stems from the fact that specialist centres are often located in a different region or hospital network than the patient, quite often in Dublin hospitals.

- Assuming that patterns of referral between hospital networks do not change, the North Eastern and South Eastern networks are projected to experience the highest levels of growth at 29 per cent

and 28 per cent respectively by 2021. At the other end of the scale the Dublin North-East and Mid-Western networks are projected to experience the lowest levels of growth at 14 and 17 per cent respectively.

Pharma-ceuticals

- Prescribing of medicines is one of the most common interactions between clinicians and individual patients. In 2006 drug expenditure in Ireland was around €1.84 billion or 15 per cent of total health care expenditure. The General Medical Services (GMS) Scheme is the largest of the Community Drug Schemes (CDS) and it covers approximately 29 per cent of the population and accounts for nearly three-quarters of publicly-funded prescriptions.

- The other categories receiving medicines for free or on a subsidised basis are those with Long Term Illnesses and those whose drug costs exceed specified limits in the Drugs Payments Scheme. All three schemes cover approximately 2.9 million (67.4 per cent) of the population of Ireland.

- Approximately 55 million prescription items were paid for by the Primary Care Reimbursement Service in 2006. This represents an increase of over 4.7 million on 2005. The GMS scheme (medical card scheme) accounted for 40.6 million prescription items in 2006, i.e. 74 per cent of all items prescribed that year. There were 11.9 million prescriptions items issued under the Drugs Payment Scheme and 2.2 million items under the Long Term Illness Scheme.

- The double-digit year-on-year increase in drug expenditure under the Community Drug Schemes is amongst the highest in Europe even though Ireland has one of the lowest per capita expenditures on pharmaceuticals in Western Europe (HSE, 2006). The main reasons for such an increase include the prescribing of newer more expensive medications (i.e. product mix), the increased volume of prescribing (i.e. volume effect) as well as the changes which have occurred in terms of eligibility criteria. Demographic changes, such as the overall growth in population size and a small increase in the number and proportion of older people in the population, may also have contributed to this increase.

- The number of prescription items increases strongly with age although there are brief falls after early childhood and between the ages of 70 and 74 years. The number of items is also slightly higher for women compared to men. At each age after 15 years women are prescribed a higher number of items than men. Similarly, average costs of medicines also increase with age. Older groups are also prescribed more expensive medicines on average than younger age groups.

PROJECTING PHARMACEUTICAL PRESCRIBING TO 2021

- Assuming that trends in prescribing remain at the long-run average found between 1995 and 2006, the total number of prescription items in all three schemes is estimated to increase to 105 million prescription items by 2021. This is almost double the number of items in 2006 (55 million items). The majority of the 105 million

items will be under the GMS Scheme (75.7 per cent) followed by the Drugs Payment (18.75 per cent) and Long Term Illness Schemes (5.5 per cent).

- If the steeper growth trend which occurred between 2001 to 2006 is maintained over our projection horizon the total number of prescription items in all three schemes is projected to increase to 140 million prescription items by 2021, a 254 per cent increase.

- Assuming the lower rate of growth observed between 1995 and 2006, it is estimated that total ingredient cost will escalate to €2.4 billion in 2021 across all three schemes from €1.06 billion in 2006.

Long-Term Health and Social Care Services

- Need for long-term care is most immediately driven by four factors: population growth, developments in life expectancy, disability trends, and trends in household composition. In addition, rising expectations and supply-side factors, such as greater availability of services, may convert hitherto unmet need into active demand for care.

- Requirements for a higher standard of care may increase the cost of care, particularly the staffing levels required to deliver care. Developments in the acute sector, such as reduced length of stay, may translate into increased demand for long-term care. Severe disability is generally considered a reasonable proxy for the need of long-term care, thus defining and measuring disability is important in assessing demand for long term care.

- Long-term care can be provided either at home or in institutions, including nursing homes and long-stay hospitals. New forms of residential arrangements for older people have emerged in many OECD countries over the past 15 years, including sheltered housing options. On occasion long-term care is provided in acute hospitals due to the unavailability of care in appropriate long-term institutions or the community.

- In the community, long-term care may be supplied by informal carers, typically family members, or by formal carers. It may be delivered publicly, privately or by the voluntary sector, with a greater or lesser degree of state subsidy. Female labour force participation rates are critical to determining the availability of informal carers.

PROJECTING NEED FOR LONG-TERM CARE

Population Ageing

- The number of older people in Ireland is forecast to rise substantially over the years to 2021, bringing the proportion of older people in the population from one of the lowest in the OECD to higher than the current OECD average. Under the preferred projection scenario in this report the growth in absolute numbers of people in older age brackets is considerable, with numbers aged 85 years and over more than doubling from 48,000 to nearly 106,000 and those aged 74-84 years increasing by over a half from 157,000 to 248,000.

- With total population increasing by 21 per cent over the forecast period, the proportion of population aged 65 years and over rises from 11 per cent to 15.4 per cent and the proportions aged 80 years and over and 85 years and over respectively, rise from 2.7 per cent to 4.0 per cent and from 1.1 per cent to 2.1 per cent.

Household Composition and Informal Care Supply

- Female labour force participation can be expected to continue rising if recent trends persist. The Irish cohort of 25-34 year old women, who in 2006 showed the highest labour force participation rate at nearly 79 per cent, will by 2026, become the cohort of 45-54 year old women, on whom the burden of unpaid care currently falls most heavily (Layte *et al.*, 2009).

- Although increased female participation will reduce the availability of women working in the home to provide informal care for their ageing parents, the effect of increased male life expectancy will be to increase the availability of care by spouses. Reduction in the proportion of older women living alone is partially explained by the reduction in the proportion of never-married among those entering older age. Additionally, increased male life expectancy improves couples' prospects of living longer lives together. While these trends will work towards maintaining more people at home with their spouses and partners during the disabilities and illnesses of older age, offsetting these effects is the rising rate of separation and divorce.

Disability Trends

- Reduced disability rates at older ages between 2002 and 2006 are employed in projecting future demand for long-term care. A range of forecasts take disability rate trend reductions over 2002-2006 as the starting point for the forecast disability rate in 2021. Applying these forecast disability rates to the forecast population in 2021 generates a range of forecasts for the population with substantial physically limiting conditions (the proxy for severe disability). The central forecast is for an 18.6 per cent disability rate among people aged 65 years and over in 2021, generating a forecast population with severe disability of 147,677.

PROJECTING THE DEMAND FOR RESIDENTIAL LONG-TERM CARE

- In 2006, an estimated 94,400 people aged 65 years and over had substantial physical disabilities and 22,500 people aged 65 years and over were long-term care residents. This gives a ratio of population aged 65 years and over with substantial physical disability to LTC residents aged 65 years and over of 4.2:1.

- Applying this ratio to forecast population with severe disability, the initial forecast demand for residential long term care for people aged 65 years and over in 2021 would be 35,200 places or 4.4 per cent of over-65s compared to 4.8 per cent in 2006.

- Taking account of patients in acute hospitals who require long-term care increases our forecast demand for residential long-term care places in 2021 to 35,820 or 4.5 per cent of the population aged 65 years and over. This suggests a requirement for an additional 13,324 long-term care places from 2006 to 2021 or 888 places per annum from 2007-2021 for people aged 65 years and over.

PROJECTING RESIDENTIAL LONG-TERM CARE DEMAND FOR HSE REGIONS

- When forecast national demand for residential care is apportioned in proportion to the regional share of population aged 65 years and over, demand is forecast to be greatest in Dublin/Mid-Leinster and lowest in the Western Region. Dublin/Mid-Leinster is forecast to have 4,135 additional residents in 2021, a 79 per cent increase over 15 years.

- If the basis for apportionment of forecast national demand for residential LTC is the regional share of population aged 85 years and over, Dublin/Mid-Leinster remains the region with the greatest forecast increase in residents at 3,664 with the Southern Region close at 3,592.

- Long-term care demand can be further adjusted to take into account the wide regional variation in occupancy rates in 2006. These adjusted forecasts assume that residential occupancy rates level up to the Dublin/North-East level of 93.8 per cent before additional places are required. The effect of this adjustment is to emphasise the relatively greater forecast demand in the two Dublin-centred regions where occupancy is already high. Dublin/North-East's need for places overtakes the Southern Region in the occupancy-adjusted scenario where long-term care demand is apportioned relative to share of population aged 65 years and over.

EFFECT OF ACUTE CARE DEVELOPMENTS ON DEMAND FOR LONG-TERM CARE

- The Irish government has adopted a policy of reducing resources in acute care and transferring resources to the community sector – the 'preferred health system'. If this policy were implemented, the acute inpatient bed requirement in public and private hospitals is projected to reduce to 7,777 in 2020, while beds for day procedures would increase to 4,125 from 2,016 in 2007. This would reduce Ireland's ratio of acute inpatient beds to 1,000 population to 1.1 and the ratio to 1,000 people aged 65 years and over to 7.4 in 2020. OECD data show that this projected inpatient bed count would place Ireland at the bottom of the current OECD range of inpatient bed capacity for countries with similar age profiles.

- Although the preferred health system incorporates assumptions about reduced bed utilisation deriving from future changes in medical practice, which might reduce bed ratios in other countries, Ireland's placing, nonetheless, suggests that the model implies moving to the model of health care provision in Sweden which has the lowest current acute bed complement in the OECD comparison.

- When Sweden reduced its acute capacity it also increased long-term care capacity, with 7.5 per cent of over 65s currently receiving long-term care in institutions and 9.5 per cent receiving formal care at home. For Ireland to achieve a Swedish level of provision relative to the population aged 80 years and over would require 21,300 additional long-term care beds compared to the 13,300 of our initial forecast. This would imply a residential utilisation rate of 5.5 per cent for over 65s in Ireland in 2021.

Conclusions and Implications

- The increased demand for health care likely to stem from demographic and epidemiological change in the Irish population is significant. Even if national finances improve substantially, the current way in which care is delivered will be unsustainable within any reasonable budget given the nature of demographic change. This demands a reconfiguration and intensification in the use of health care resources and improvements in levels of efficiency. Changes in the manner in which current resources are used and a reorganisation of services will moderate the extent of investment in new services required.

- Even without attempting to change to the preferred health system envisaged by the HSE, a full implementation of the 2001 Primary Care Strategy would make better use of existing primary care resources and moderate the impact of population ageing and GP ageing and feminisation. Similarly, more and better use could be made of other medical professionals, such as practice nurses and pharmacists. A move to the preferred system would make a reorganisation of primary care even more critical. However, even if the service were completely restructured before the implementation of the system it would still be necessary to increase GP training numbers and other resources if even current levels of access were to be preserved.

- Analysis shows that a substantial proportion of resources in Irish outpatient care are expended on monitoring and maintaining chronic health conditions that could be just as successfully managed and much more cheaply managed in primary care.

- The HSE's preferred health system strategy is premised upon the reduction of average inpatient length of stay in Irish hospitals through the greater use of day case and particularly day surgery. Although the varying complexity of the case load across hospitals can lead to differences in day case rates, the current variability would suggest that there is substantial potential to increase day rates across the Irish hospital system and in doing so significantly increase the level of efficiency.

- Average length of stay is also influenced by patient characteristics and older age and chronic illness in particular. Analysis suggests that the lack of step down services has a critical influence in reducing the efficiency of acute hospitals in Ireland, particularly voluntary hospitals whose patient load tends to be older and more likely to have disabling conditions. A model of 'continuous care' would provide appropriate support for patients as they move from acute

hospital care to convalescent or assessment bed before transition either into long term care or back home, perhaps with community support.

- The inter-dependency of health care sectors underlines the need to think about reform on a system-wide basis. A transition to the preferred health care system model will require development of both primary and long-stay services as well as social care services if it is to be practicable and not lead to a severe degradation in the level and quality of service.

1. THE COMPLEX TASK OF PROJECTING THE DEMAND FOR AND DELIVERY OF HEALTH CARE

Richard Layte, Edgar Morgenroth, Charles Normand

1.1 Introduction

This is the final report in a series of three commissioned by the Health Research Board (HRB) to investigate the impact of demographic change on the demand for and delivery of health care in Ireland to 2021 and the implications that this has for the future planning of the health services in Ireland. The project has four specific objectives:

- To examine recent experience of population change in Ireland and assess its effects on demand for health services, focusing in particular on the period 2001-2006. This analysis is set in the context of international research on the influence of population change on demand for health services and draws conclusions on the main drivers of overall and sectoral demand for health services in developed societies. The results of this work are contained in Layte *et al.* (2009).

- The second objective was to develop and set out population projections for Ireland for the period 2006-2021, disaggregated by age-group, sex and county, with additional disaggregations by migrant/ethnic status, family status and household size. This work is contained in Morgenroth (2009) and is summarised in this chapter.

- Applying the analysis developed in Report No. 1 to the projections set out in Report No. 2, in order to examine likely population-driven trends both in overall and regional-level demand for health services in Ireland up to 2021, and in the sectoral distribution of demand within the health system, that is, in regard to hospital inpatient, hospital outpatient, GP services, pharmaceuticals, and long-term health and social care services.

- To set the population effects on health service demand in the context of other drivers of demand and draw overall implications for trends in health service demand up to 2021.

The third objective above, i.e. the application of the demographic projections to the analysis of recent trends in health care utilisation is the main task of the present report. It is important to underline the fact that demographic projection is an exercise in managing uncertainty and this uncertainty is amplified when demographic projections are used to project another dimension such as demand for and utilisation of health care. The projections generated in this project (Report 2: *Demographic Projections for the Period Until 2021* by Morgenroth, 2009) are derived by utilising a cohort component model of the population using assumptions based on past trends in population change in Ireland, and with knowledge of how such trends can interact with other social and economic processes. A good example of this is the interaction of economic growth with trends in migration to Ireland. Recent years have seen an enormous growth in migration to Ireland, particularly from Eastern Europe following the accession of several states to the EU in 2004. This trend reflects both the bouyant Irish economy, and economic circumstances in the country of origin. For example, sound projection of migration trends relies upon an understanding of how Irish economic trends drive inward migration and the extent to which this is counter balanced by economic trends in other countries. This requires a complex macroeconomic model and consequently this project relies on other work carried out at the ESRI for the *Medium-Term Economic Review* (Fitz Gerald *et al.,* 2005; 2008) and the *Quarterly Economic Commentary* (Barrett *et al*., 2008).[1]

The migration example is also useful for pointing out another characteristic of the art of projection: that it is probabilistic in the sense that circumstances can change and the central forecast can become redundant. The speed at which circumstances can change means that there should be regular updates to any projection to account for developments. The projection in this report is no different. Furthermore, while having been calculated for each year in the forecast horizon, our projections should be viewed more as trend over the longer term rather than an indicator of the actual population in any particular year. In other words, they are constructed to minimise the average deviation from the actual but not necessarily any particular deviation. This is important in the context of the current recession which is likely to have an impact on migration and possibly fertility. While migration might currently be significantly different from the assumed level in the model, the probability that it is significantly different over the whole forecasting period is likely to be low.

In this chapter we briefly review the many possible drivers of health care utilisation that have been put forward in Section 2 before outlining the demographic projections from the project (Morgenroth, 2009) in Section 3. In Section 4 we then discuss our methodological approach to combining demographic projections with the analyses of health care utilisation carried out in Layte *et al*., 2009. In Section 5 of this report we discuss recent

[1] As Report 2: *Demographic Projections for the Period Until 2021* (Morgenroth, 2009) was completed early in 2008, with the projections being finalised late in 2007 before the most recent *Medium-Term Review* was published, it draws on data from the 2005 *Medium-Term Review*.

evidence on trends in population health in Ireland before setting out our own methodology for projecting epidemiological change out to our projection horizon in 2021.

1.2 The Complex Drivers of Health Care Utilisation

The patterns of health care utilisation and pharmaceutical use that we observe in health statistics represent the outcome of the complex interplay of different factors that interact over time. The primary objective of this project is the measurement of the impact of demographic change over the recent past and the projection of this effect into the future, but many other factors are as, or even more important than the changing composition and size of the population. Figure 1.1 below gives some flavour of the complexity of factors that can be said to contribute to overall utilisation.

Figure 1.1: The Complex Drivers of Health Care Utilisation

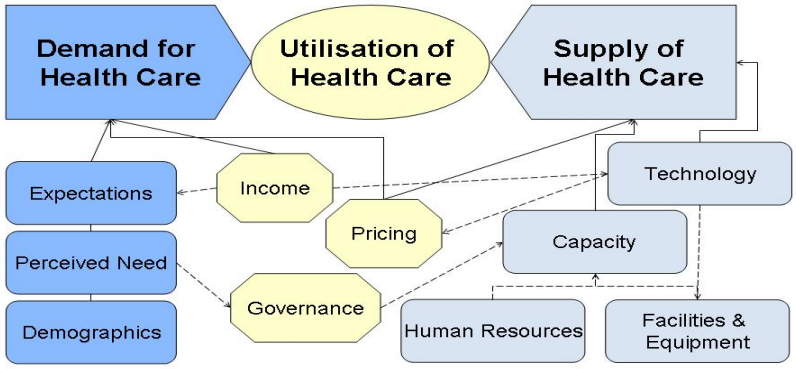


Figure 1.1 is roughly divided into factors influencing the 'demand' for health care on the left (e.g. health status and perceived need, demographic factors and expectations) and those influencing the 'supply' of health care on the right (capacity, facilities, resources and governance). The first report from this project (Layte *et al.*, 2009) showed clearly that health status and the 'need' for health care are important determinants of usage across all areas of health care as shown directly by different measures of health and proxies such as age (use of health care increases strongly with age). Worsening health and the experience of disease clearly increase the probability that someone will seek care, but the relationship is not simple as the decision is mediated by the person's expectations about the availability and effectiveness of care. Such expectations change over time. Physical symptoms that may have been perceived as a natural part of the ageing process in previous generations are now regarded as treatable and this increases the probability that the person will seek care. Changing expectations increase the demand for health care and thus health care utilisation.

TRENDS IN POPULATION HEALTH STATUS

The changing age profile of the Irish population to 2021 is clearly a central issue of this project, but in assessing the impact of age, we also need to assess the impact of changing health status over time. There is some evidence from studies of older people in Ireland (McGee *et al.,* 2005), the

UK (Cutler, 2001) and the US (Manton, Corder and Stallard, 1997) that levels of disability are falling, reflecting real increases in health status. The recent survey of Health and Social Services for Older People (McGee et al 2005) showed that disability had fallen significantly between 2000 and 2004 among the Irish population aged 65 years or more and evidence on trends in disability between 2002 and 2006 also indicates a downward trend. However, analysis from the Institute of Public Health in Ireland (IPH, 2008) and the National Cancer Registry (NCR, 2006) also shows that other trends such as rates of diabetes and cancer do not appear as positive and this may mean that epidemiological trends are not so positive. We return to the issue of trends in population health and their relationship to health care utilisation in the last section of this chapter.

THE SUPPLY OF HEALTH CARE

The supply of health care is also a very important determinant of utilisation. All health care systems are supply constrained to some degree and in Ireland this is a very significant factor influencing utilisation. This can be seen in the significant waiting lists for many procedures, but can also be seen in the patterns of use in general practice (GP) see (Layte *et al.*, 2009). This showed that GP utilisation is strongly influenced by the pricing structure of GPs in Ireland. Around a third of the population have free access to their GP by virtue of their medical card whilst the remainder of the population pay the GP fee out of pocket. Analyses show that this leads to higher levels of GP utilisation among medical card holders, even controlling for differences in health status and an increase among non-holders as income increases. The fact that current levels of utilisation are constrained is very important for our analyses of future trends as this report will be attempting to quantify the levels of health care required to 2021 given a certain set of demographic changes. The project needs a 'baseline' from which to project future use but in absence of a measure of the 'appropriate' level of utilisation for a given population, most projects of this type fall back on current levels of utilisation as the baseline. This project attempts to get round this problem by examining international levels of care provision and using these as an indicator of the appropriate level of provision. This approach does not entirely circumvent the problem since other countries are also likely to be supply constrained to a certain extent, but it does present a better alternative to the traditional approach.

THE MIX OF PUBLIC AND PRIVATE MEDICINE IN IRELAND

Irish health care services are a complex mixture of public and private provision and financing. This is particularly true in the hospital sector where public hospitals and publicly employed consultant doctors cater for both public and private patients. The intermingling of public and private medicine in Irish hospitals has been driven by the steady increase in the numbers of Irish people with medical insurance which has grown from 4 per cent in 1960 to over 50 per cent by 2003 (Health Insurance Authority, 2003). The overwhelming majority of private medical practice in Ireland is carried out in public hospitals by consultants who have public service contracts which means that data on these activities are contained within the Hospital In-Patient Enquiry System and are thus available for analysis as part of our projection. Private care within private hospitals are not included in our analyses but these activities constitute a small fraction of total discharges within the Irish hospital system.

THE RECIPROCAL RELATIONSHIP BETWEEN SUPPLY AND DEMAND

Although many of the main drivers are represented in Figure 1.1 it cannot represent the complexity of the interaction between the different factors that occur in reality, particularly in terms of the impact of constraints on the supply of health care on patterns of demand. For example, if the availability of many hospital procedures increased it is likely that the demand for these procedures would also increase as the present level of demand is determined to a certain extent by the expectations of patients and doctors about what is available within the system in a practical time frame. It is also true that new technologies and developments can also stimulate demand by making new treatments possible or improving the balance of costs and benefits. Although initially on the right hand side of Figure 1.1, these developments are likely to also stimulate the left hand side increasing overall utilisation.

1.3 Demographic Projections for Ireland to 2021

Report No. 1 from this project (Layte *et al.*, 2009) laid out a detailed analysis of the role of demographic factors in determining health care utilisation and detailed some recent demographic trends in Ireland. Central to this project is the composition of the population in terms of age but the report argued that ageing may not be the primary driver of demand for health care in Ireland. Ireland's population is actually 'ageing' more slowly than many other countries with the proportion aged 65 years or over now the same as it was in the 1960s at around 11 per cent. By 2021 this proportion will have risen to 15.4 per cent (see Morgenroth, 2009), a threshold breached by the UK in 1985 and Germany in 1992. Analyses of trends in health expenditure also suggest that population ageing only accounts for one-tenth of the increase in expenditure experienced across OECD countries between 1970 and 2002. In this respect income growth, changes in medical technology and medical inflation may be more important drivers of expenditure and these operate independently of the age composition of the population.

Layte *et al.* (2009) also showed that other population composition effects may also be important. The rise in the marriage rate among Irish people in the 1970s and 1990s means that the proportion never married is steadily falling and this trend is expected to continue over the coming years. Marital status is a determinant of health with married people generally found to be healthier than non-married, but spouses and children are also an important source of informal care for older and dependent people. Projecting this development to 2021, Morgenroth (2009) suggests that the proportion of those aged 65 years or more living alone in 2021 will remain at the same levels as in 2006: 26 per cent.

Layte *et al.* (2009) suggest that the growing size of the Irish population is particularly important in determining the future demand for health care. Although Ireland suffered long-term population decline for the century following 1851, increased again from the 1960s on and grew particularly strongly between 1996 and 2006 at 1.7 per cent per annum. Between 2002 and 2006 this rate of increase was 2 per cent per year. Population change is the outcome of three processes: fertility, mortality and net migration and each has important implications for the provision of health services. We

look at each of these processes in turn before laying out their impact on demographic change in Ireland to 2021.[2]

FERTILITY AND BIRTHS

Ireland maintained a high fertility rate until approximately 1980, after which fertility declined markedly (in 1965 it peaked at 4.03). Fertility has been below replacement (2.1) since 1991. There was a further significant decline in fertility in the early 1990s, which was followed by an increase until 2003, but more recently it has been declining again. Considering the period from 1960 to the present, there is a clear long-term downward trend in fertility. Thus, the substantial decline, which was followed by an increase that was not sustained is likely to have been a short-term deviation from that trend. This is likely to be explained by a trend to an increased age at first childbirth, which is reflected in an increase in the average age at childbirth, which rose from 28.5 in 1991 to 30.8 in 2004.[3] Indeed, an analysis of age specific fertility rates reveals that the decline in fertility in the early 1990s was primarily driven by a decline in fertility among woman aged 20-29 years for which age specific fertility rates have continued to decline to the present. On the other hand, age specific fertility rates for woman aged 30 to 34 years and particularly those aged 35-39 years have increased. This may be explained by changing economic and sociological factors. The economic factors relate to the marked increase in labour market participation by women, which is in part driven by the increasing educational attainment among females.

There have been a number of interesting developments at the county level. First, crude birth rates have increased over time, but there appears to be some divergence across counties. Second, there appears to be a pattern of lower rates in Western and Northern counties and high rates in the chief commuting counties particularly around Dublin. However, once one calculates the total period fertility rates (TPFR), which indicates the total number of children a woman will have over her lifetime based on age specific fertility rates this pattern changes. While commuting counties have high rates of fertility, counties that contain a large city tend to have lower fertility and a mixed picture emerges for the remainder of the counties. For example, while Monaghan has a low crude birth rate and a low TPFR, Leitrim has a low crude rate but a relatively high TPFR. These patterns are likely to be related to the age structure within each county.

Given the above trends at the national and county level it is possible to derive a number of plausible assumptions. Since it appears that the deviations of the county TPFRs are roughly constant, it appears reasonable to assume that the deviation of the county TPFRs from the national average will remain constant at their 2006 levels. For the projection model the TPFRs were transposed into age specific fertility rates which were then applied to each cohort of women. Because the variation in age specific fertility rates across counties appears to be relatively stable these are

[2] More detail on fertility, mortality and migration trends plus analysis and projections can be found in the second report from this project entitled: Report 2: *Demographic Projections for the Period to 2021*.

[3] Accurate comparisons of the age at first birth are not possible as data for 1991 is only available for first births within marriage (83 per cent of all births) and for mothers aged above 29 years only for age groups rather than single year of age.

assumed to change at an equal rate for each age group, which preserves this pattern. Given these assumptions one requires just an assumption for the national TPFR in order to derive county level fertility rates. Regarding the national trend two plausible scenarios can be identified from recent trends. First, if one considers only the more recent period then a constant TPFR would seem plausible (this corresponds to the values for 2006 being carried through until 2021). This is our first scenario, which we term F1, following the terminology used by the CSO. Second, if one considers the slightly longer-term trends then one would expect TPFR to follow a long-term decline. The second scenario, F2, assumes that TPFR will decline to 1.65 by 2016 after which it will remain constant.

Under the F1 assumption (which maintains the 2006 age specific fertility rates) the number of births will fall, but not until after 2014 reflecting the decline in the most fertile female age cohorts. With the F2 assumption of declining fertility this decline happens at a much faster rate even though in both scenarios the peak is reached in the same year thus after an initial rise, births fall from 64,237 in 2006 to 62,101 in 2016 to 58,400 in 2021. At the county level interesting differences emerge with Dublin experiencing the largest decline while a few counties such as Roscommon and Leitrim would experience an increase in the number of births, reflecting a different age structure and internal migration pattern. Given recent trends and on the balance of evidence we feel that the F2 scenario is more likely to occur and so we adopt this as our central projection for fertility. In doing so we follow the same path as the CSO who also project fertility to fall (CSO, 2004).

MORTALITY AND DEATHS

The absolute number of deaths occurring within the state has been declining since the early 1990s, with Ireland experiencing a particularly sharp fall in deaths after 1999. Given that there has been population growth during this period, this implies a substantial drop in the crude rate of deaths, which did indeed decline from 9 per 1,000 in 1991 to 6.6 per 1,000 in 2005. There has been a concomitant improvement in life expectancy over the last decade and a half. For males, the life expectancy at birth has increased from 72.3 years in 1990 to 75.1 years in 2002, with further improvements expected over the last four years. Age specific mortality rates have changed dramatically. For example, mortality rates for 55 and 60 year olds has halved since 1986, while that for 80 year olds has improved by a third.

Assumptions about age specific mortality rates are needed for a population projection model. The CSO publish Life Tables, which contain such rates, based on mortality in a three year period around a Census. Comparison of the four most recent Life Tables published by the CSO which cover the periods 1985-1987, 1990-1992, 1995-1997 and 2001-2003 (see Morgenroth, 2009) show quite substantial improvements in age specific mortality rates at all ages but particularly among older age groups. This mirrors similar trends in other developed countries and in this respect it should be noted that life expectancy in Ireland has converged rapidly to the EU-15 average over recent years. The simplest way to project mortality probabilities is to assume that improvements will occur at the historic rate which gives rise to a linear projection. This is the method chosen in the

past by the CSO.[4] The advantage of this method is that it is simple to implement. The disadvantage is that the results are dependent on the time period that is chosen on which to base the rate of improvement on, and furthermore if there are any non-linearities these cannot be accommodated. Thus, if one suspects that there are cohort effects or that the rate of improvement will gradually decrease due to some limitation, then this linear projection is likely to overestimate the improvements in the long-run. Internationally, research has pointed at a cohort effect where a particular cohort benefits from accelerated improvements in age specific mortality rates that are not achieved by subsequent cohorts. In particular this appears to affect the cohort born between 1923 and 1943 (the 'Inter War Cohort'). Recent research by Armstrong *et al.* (2007) suggests that the cohort effect for Irish males is weak. Nevertheless, the simple trend extrapolation may not be as accurate as alternative methods.

An alternative method to the simple extrapolation is to assume that over the long term the rate of improvement will return to its long-run average which given historic data may be somewhere between 1 and 2 per cent per year. In the interim period the rate of improvement is that pertaining to the recent past. This allows for a non-linearity in the rate of improvement without becoming overly technical. This method has recently been applied to Ireland by Shane Whelan of UCD (see Whelan, 2008). More specifically the long-run rate of improvement is assumed to be 1.5 per cent after 2031 while the rate of improvement between 2005 and 2031 was calculated as a linear extrapolation between the rate of improvement in 2005 and that of 2031 (1.5 per cent).[5,6] Of course, these tables apply to the national population and clearly local differences in mortality may apply. However, it is beyond the scope of this study to construct Life Tables for each county. Indeed, data limitations would make such analysis exceedingly difficult. Consequently, we apply these national tables at the county level.

MIGRATION

One of the most remarkable features of demographic change over the last 15 years has been the change in the pattern of migration. While there was some positive net immigration in the 1970s this was mostly of returning Irish nationals. In contrast, recent inward migration has been by immigrants with no previous connection too Ireland. Figures (see Morgenroth, 2009) show that immigration trebled from just over 40,000 in 1996 to almost 122,000 in 2006. While almost half of the immigrants in 1996 were born in Ireland and were thus return migrants, this proportion had declined to a fifth by 2006. In 1996, the UK accounted for more than half of all migrants while in 2006 non-EU-15 European countries accounted for 45 per cent of immigrants, and indeed of those a large

[4] In the last published population projections the CSO projected mortality improvements according to historic improvements over the period 1986 to 2002, with the exception of males aged 20-29 years for whom the improvements over the 1996 to 2002 were applied.
[5] It has been accepted by the CSO that these projections are superior to their traditional trend extrapolation method and hence the CSO will use these in their next set of population projections.
[6] Some sensitivity analysis using alternative assumptions shows that over the relatively short forecast horizon to 2021 a range of plausible assumptions yields very similar results, since the size of the cohorts that will be aged over 75 years by the forecast horizon is relatively small.

majority originated in Poland. Another notable fact is that the number of immigrants from African countries has declined significantly since 2002.

Given the finding that the pattern of internal migration has been stable since the substantial changes in the 1990s, it was assumed that these patterns would pertain over the forecast horizon. The slump in the housing market and the recession could impact on this pattern, by altering the relative price of housing, housing affordability and job opportunities across the country. At this point it is not clear what this impact will be. While it may result in a return towards the traditional pattern of internal migration, many of the recent internal migrants will not be in a position to migrate due to negative equity. The age structure of internal migration is also assumed to remain stable over the projection horizon. In general migrants, internal and international are predominantly in the 20 to 34 years age group. Also notable is that international migrants are less likely to migrate with children than internal migrants, which is reflected in the smaller proportion of migrants in the 1-14 years age group. This may either reflect the fact that international migrants are more likely to be single, they have fewer children or that they leave their family in their home country. Overall, few migrants are aged over 65 years. The latter is important since this implies that the number of older persons is essentially independent of migration. On the other hand, while international migrants are less likely to migrate with children given the size of the flows and the age structure (largely younger adults) international migration does have a significant impact on the number of births.[7]

Projections for international migration in this project are based on the ESRI *HERMES* model which takes explicit account of the relationship between economic growth in Ireland, labour demand and international migration. The most recent projections for that model available at the time the population projections were constructed were made as part of the 2005 ESRI *Medium-Term Review* (*MTR*) (see Fitz Gerald *et al.* (2005). The *MTR* proposed two economic scenarios, a high growth scenario and a low growth scenario. The expectation at the point of publication of the *MTR* was that Ireland would continue on the high growth scenario but make a transition to the low growth scenario at some point due to a deterioration of external circumstances (see Morgenroth, 2009). The two growth scenarios have very different implications for net migration in that a continued high growth scenario would lead to increasing net-immigration while the low growth scenario would have the opposite effect. During 2007 it became clear that the Irish economy was now facing the low-growth scenario, or more likely a recession scenario. The changing underlying economic structure of the Irish economy along with the changing external environment will reduce immigration. Given this, it seems most appropriate to calculate our population projections on the basis of the low-growth scenario.[8]

[7] By 2021 the difference between the zero net international migration projections and the positive international migration projection regarding births is 7,500 or 15 per cent.

[8] Given that the *Quarterly Economic Commentary* has since predicted net emigration, a sensitivity analysis was carried out. Allowing for a smooth return to net-immigration as projected by the *MTR*, would reduce the projected population by around 300,000 as compared to the core scenario, but leave the number of persons aged 80 years and over unchanged. However, no firm evidence of significant emigration has yet been published.

PROJECTED OVERALL POPULATION CHANGE

The sections above have outlined the findings from the population projection report for the three drivers of overall population change: fertility, mortality and migration. Two main scenarios were set out for fertility: one assuming unchanged fertility going forward (F1) and one which assumes a declining fertility rate (F2). Similarly, for migration we set out two alternative assumptions: a zero international migration scenario (M0) and a declining migration forecast (M2). As discussed above the M2 scenario was significantly more plausible at the time of preparing the projections than a more bullish high immigration scenario (M1). We also considered the declining fertility assumptions (F2) more convincing and so adopt this combination of forecasts in our core projection (the M2F2 projection). In this section we briefly set out the pattern of overall population change that is expected using M2F2.

Under the M2F2 projection migration remains positive throughout the period to 2021, but reducing over time. With the assumption of falling, but moderating mortality rates and slowly falling fertility to 2016 and then constancy, these developments lead to an increase in overall population of almost 900,000 from 4.24 million in 2006 to 5.1 million in 2021. The level of growth is strongest in the earlier years of the projection as this is when levels of fertility and migration are highest. Thus between 2006 and 2011 population growth averages 2.3 per cent per year, with the level moderating to 1.7 per cent per year 2011-2016 and 1.4 per cent 2016-2021. If migration were to fall to zero in the early stages of the projection horizon overall population growth would moderate to almost half a million (4.71 million) but other population trends would continue.

POPULATION TRENDS AT COUNTY LEVEL

We see increases in population in all of the 26 counties between 2006 and 2021 although rates differ substantially. Continuing the trend of recent years the growth of Dublin will slow to 2016 and then reverse leading to a small decrease in population between 2016 and 2021. This reflects the assumption of an unchanged internal migration pattern from that pertaining to the period from the late 1990s to 2006, which saw substantial internal outmigration from Dublin, particularly to the surrounding counties. Given the assumption of declining international immigration, which went disproportionally to Dublin, the loss of population through internal migration is compensated for at a decreasing rate. Consequently, Dublin is the only county projected to experience a year-on-year decline in population during the period to 2021 although there will be overall growth between 2006 and 2021.[9] On the other hand, Meath is projected to experience the largest increase in population over the period with an increase of 61 per cent between 2006 and 2021 followed by Laois, Cavan and Wexford with growth rates of 48 per cent, 44 per cent and 39 per cent respectively. At the other end of the spectrum Dublin has the lowest rate of growth between 2006 and 2021 at 8 per cent preceded by Kerry and Sligo at 13 per cent.

[9] It is important to note that projections are not plans. They are based on past trends and policies. If the circumstances change or appropriate policies to shift the internal migration pattern back to the traditional pattern were enacted then a very different outcome would be expected.

In terms of the age structure of the population, Table 1.1 shows that population distribution is projected to change significantly in the period to 2021 with the proportion in the younger age groups set to decline whereas the proportion over age 50 years will increase. The number of under 5s in the Irish population is set to fall both absolutely (by 32,000) and relatively (by 1.2 per cent). The proportion aged between 15 and 49 years will fall even more strongly over the period from 53 per cent of the population to 48 per cent. On the other hand, the proportion of those aged 65 years or more will increase from 11 per cent to 15.4 per cent with the proportion in the oldest age group, those aged 85+ years increasing from 1.1 per cent to 2.1 per cent. Although a small increase in overall population terms this increase represents almost a doubling of the number aged 85+ years from 63,000 to 105,900, an increase of 42,900. One striking feature of the projection is that the number of older people in the population would rise significantly even without the projected improvement in mortality rates. Another important feature of note is that the number of older Irish people is almost entirely independent of the migration assumption since there is essentially no international migration among the older groups. Consequently, even high immigration leaves the totals of those aged over 65 years, almost unchanged over the projection horizon. Of course, if this horizon were extended then international migration would impact on the number of older people.

Table 1.1: Current and Projected Distribution of Population Across Age Groups 2006-2021

Age Group	2006	2011	2016	2021
	%	%	%	%
0-4 years	7.1	7.2	6.6	5.9
5-14 years	13.3	13.1	13.3	13.0
15-49 years	53.1	51.7	49.8	48.0
50-64 years	15.4	16.1	16.8	17.8
65-74 years	6.2	6.7	7.7	8.5
75-84 years	3.7	3.8	4.1	4.8
85+ years	1.1	1.4	1.7	2.1
Total	100.0	100.0	100.0	100.0

POPULATION TRENDS BY HEALTH SERVICES EXECUTIVE AREA

Analyses by county show very similar trends in the distribution of age groups across the projection horizon, across all counties with younger age groups declining as a proportion of the population and older age groups increase. The decline in the proportion of younger age groups is particularly marked in the southern and western counties of Ireland, whereas the decline in the 15 to 49 year age group will be more strongly felt in Dublin and the surrounding counties. If we translate these developments into Health Service Executive (HSE) Regions, this leads to the patterns that can be seen in Table 1.2.[10] This shows fairly uniform developments across the HSE regions in terms of the decrease in the proportion accounted for by younger age groups and increase in proportion associated with older groups. As stated above, the fall in the proportion in younger age groups is

[10] This is not a trivial exercise as the two HSE regions for Dublin cannot be directly mapped onto the existing county. The population of Dublin city was divided at the river Liffey and the populations attributed accordingly.

higher in the Western and Southern HSE regions whereas the proportionate increase in those aged 65+ years is fairly uniform at around 4.4 per cent across regions. The increase in the proportion of those aged 85+ years, is fairly uniform across HSE regions at just under 1 per cent between 2006 and 2021.

Table 1.2: Distribution of the Population by Age Group by HSE Region 2006-2021

	2006 %	2011 %	2016 %	2021 %
Dublin North-East				
0-4	7.2	7.3	6.6	5.7
5-14	12.9	13.1	13.%	13.2
15-49	55.1	53.4	51.1	48.9
50-64	14.6	15.3	16.2	17.7
65-74	5.7	6.2	7.2	8.1
75-84	3.4	3.5	3.8	4.5
85+	1.0	1.2	1.5	1.9
Total	100.0	100.0	100.0	100.0
Dublin Mid-Leister				
0-4	7.3	7.5	6.8	5.9
5-14	13.0	13.1	13.6	13.5
15-49	55.2	53.1	50.6	48.4
50-64	14.7	15.5	16.5	17.8
65-74	5.6	6.1	7.2	8.2
75-84	3.3	3.4	3.8	4.5
85+	1.0	1.2	1.5	1.8
Total	100.0	100.0	100.0	100.0
Southern				
0-4	7.0	7.0	6.4	5.9
5-14	13.6	13.2	13.1	12.7
15-49	51.4	50.4	48.8	47.3
50-64	16.1	16.7	17.3	17.9
65-74	6.7	7.2	8.2	8.8
75-84	4.0	4.1	4.5	5.2
85+	1.2	1.5	1.8	2.2
Total	100.0	100.0	100.0	100.0
Western				
0-4	7.0	6.9	6.3	5.9
5-14	13.6	13.2	12.9	12.5
15-49	50.7	50.0	48.8	47.3
50-64	16.3	16.9	17.2	17.7
65-74	6.7	7.2	8.3	9.1
75-84	4.2	4.2	4.5	5.2
85+	1.4	1.6	1.9	2.3
Total	100.0	100.0	100.0	100.0

THE INTERACTION OF DEMOGRAPHIC CHANGE AND HOUSEHOLD COMPOSITION

A very important determinant of the demand for health care and long-term care in particular is the nature of housing structure. Morgenroth (2009) shows that the number of households in Ireland has increased strongly over time from 1.03 million in 1991 to almost 1.5 million in 2006. Over the same period the average size of households shrank from 3.34 to 2.81 people. Our projections suggest that the average size of households will continue to fall to around 2.45 by 2021. However, overall household size is actually of less significance for health service provision than the proportion of older persons that live alone. The proportion of older persons living in

non-private households has remained constant at 10 per cent since 1991 with the proportion among men stable and the proportion among women falling marginally. With an increasing proportion of men surviving into older age it may be that the proportion of women living alone in older age will actually decrease over our projection horizon as more couples remain intact. The increase in the marriage rate in Ireland over time means that couples are also more likely to be together in older age rather than living separately. This has important consequences for the requirement for both residential and community long-term care. If more couples remain together in older age they are more likely to be able to support one another as physical and mental capacities decline leading to a smaller requirement for care.

1.4 Projecting Health Care Utilisation to 2021

The central aim of this report is to apply the demographic projections discussed above to the patterns of health care utilisation and growth trends set out in the first report from this project (Layte *et al.*, 2009a). As there, the projection will be carried out across five areas of health care: primary care, hospital outpatient services, inpatient discharges and day patients/procedures, pharmaceuticals and long-term care. This requires four steps. First, current patterns of health care utilisation for each service area are derived from national statistics and disaggregated by age group and sex where the latter proves to be an important determinant of utilisation. In the second step, trends in utilisation are identified using data for at least the last five years. In the third step, the projection is carried out by combining our projections for demographic change disaggregated by age and sex groups with current patterns of utilisation by service area with the growth trend for the recent period. In the fourth and final step the utilisation projection is inflated to take account of other processes such as epidemiological factors (trends in morbidity) and health demand (as a consequence of income trends and technological change). This approach is used in all chapters except that on hospital inpatient care. Here recent work by PA Consulting for the HSE which was published in the report entitled the *Acute Hospital Bed Capacity Review: A Preferred Health System for Ireland to 2020* (PA Consulting Group 2007a) has already carried out a projection of hospital inpatient discharges and bed days that is almost identical to the work to be carried out in this report. Rather than replicate this work we choose instead to adopt the PA analyses of acute hospital discharges and use this chapter to explore the demand and supply side factors within acute public hospitals which influence the level of day case activity and inpatient length of stay. Increasing the level of day case activity and reducing inpatient length of stay are essential if the HSE's strategy of moving toward an 'integrated health system' (PA Consulting Group, 2007a) in Ireland is to succeed (we refer to this as the 'preferred health system' or PHS). We examine evidence from the Hospital In-Patient Enquiry system on the extent of change which could be achieved.

DELINEATING SPECIFIC PERIOD EFFECTS

In assessing the trends in each health area it is necessary to separate specific period effects from longer-term trends in utilisation. A good example of this is in the area of pharmaceutical prescribing (see Chapter 5) where changes in treatment practice between 2000 and 2006 led to steep positive trends. The rate of growth in this period was 250 per cent higher than in the preceding decade and we would expect that this growth trend would not continue, although the absolute level of activity would of course remain

higher.[11] In this instance we use longer-term trends as the basis for the projection. Another important period effect is the growth in personal and household income which occurred in the previous decade. This significantly increased the demand for health services in part because rising incomes led to rising expectations about the possible benefits of health care, but also because the proportion of the population with health insurance rose steeply over the period. Health insurance increases access to health services for elective procedures by bypassing public queues and this increases the likelihood of seeking care. Separating these trends from overall growth trends is more difficult and depends largely upon the availability of data on service use, medical insurance and income levels. Where data were available analysis of trends was undertaken.

The recent downturn in the economy may also present difficulties for the projections in this report. We have already discussed previous research in the Irish context that suggests that controlling for a large number of other characteristics, individuals with a medical card are significantly more likely to visit their GP. The recent increase in the rate of unemployment will also increase the number eligible for a medical card and this could lead to an increased demand for primary care services and GPs in particular. This trend may also be exacerbated by an increase in the need for care among the unemployed as research both in Ireland and internationally shows that the experience of unemployment has a negative impact on health. However, a worsening employment situation can also decrease the requirement for residential and community care as people (overwhelmingly women) who withdraw from the labour market are more likely to be able to provide care for sick and disabled others.

INTEGRATING CHANGING HEALTH POLICY AND ACCESS

In some chapters we will also be examining the implications that changes in health policy or the availability of supply have for the delivery of health care. As explained earlier, analyses of trends in current utilisation are limited because it is not possible to ascertain whether current utilisation is constrained to a greater or lesser extent by the supply of available medical services. To get round this some chapters apply different projections based on the assumption that the supply of services or access to those services changes. A good example of the latter would be if GP services were made available to the entire population on the same basis as for those with a medical card. Research suggests that this would increase levels of utilisation significantly. Projections including such changes in supply will follow the central projection of the impact of demographic change.

[11] A similar trend could be observed in day and inpatient care in hospitals where rates of discharges increased more steeply in the late 1990s.

1.5 Projecting Epidemiological Change

Earlier on in this chapter we discussed the impact that an individual's health status has on their probability of seeking out and using health care and the fact that some evidence has suggested that levels of disability in the population are falling. The importance of epidemiological factors means that it is necessary to make some assumptions about their development when projecting health needs to 2021. Unfortunately, such a task is not simple as different indicators can yield different trends and relationships between health and use of health care are by no means simple. For example, it is essential to make a distinction between diseases and disabilities. As Crimmins (2007) has argued, whereas the prevalence of a large number of diseases is increasing, the prevalence of disability may be decreasing. These paradoxical trends are possible because the increased detection of some diseases over recent decades has not necessarily led to an increase in disability as improvements in health care, lifestyle, medical technology and the built environment have meant that many diseases are less severe and impact less on function. The task of projecting the impact of disease and disablement on health care utilisation is made more complex by the fact that different diseases have different effects on use of GPs, hospitalisation, long-term care etc. For example, The World Health Organisation has estimated that up to 80 per cent of GP consultations and 60 per cent of hospital bed days related to chronic diseases (Singh, 2008) such as diabetes, cardiovascular disease and chronic obstructive Pulmonary Disease. However, these diseases and other chronic conditions do not tend to be the primary cause of transition into long-term residential care. Analysis of the National Disability Survey carried out for this report (see Chapter 6 for more detail) show that those individuals aged over 65 years who report 'severe disabilities' (in effect this means that they cannot do everyday activities "at all" or experience a lot of difficulty in doing so) in the categories of speech, remembering and concentrating, intellectual and learning, or emotional, psychological and mental health have the highest probability of being resident in communal care (nursing homes and long-term care hospitals).

The difference in the impact of chronic and acute illness compared to disability on different areas of health care means that we chose to adopt a two-pronged approach. For the chapters on primary care, outpatient services, inpatient services and pharmaceuticals we constructed an epidemiological measure of trends in acute and chronic illness. For the chapter on long-term care on the other hand we carried out detailed analyses of data sources on trends in disability.

EPIDEMIOLOGICAL PROJECTIONS FOR TRENDS IN CHRONIC AND ACUTE ILLNESS

We were aided in the task of creating epidemiological projections for the period to 2021 for chronic and acute illness by the fact that the recent report on acute bed capacity (PA Consulting Group, 2007b, pp. 80-82) had already brought together a database of projections for particular diseases that could act as a template for our own analyses. The PA report combines projections on four disease areas:

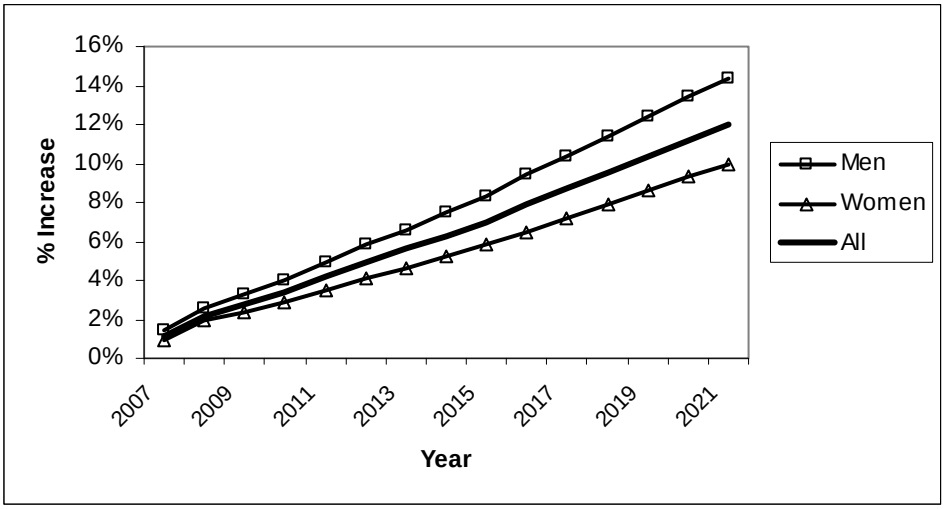
- Diabetes (from the Irish Population Health Observatory and the Institute of Public Health in Ireland).
- Cancer (from the National Cancer Registry of Ireland).

- Cardiovascular disease (hypertension, ischeamic heart disease & stroke – from the Irish Population Health Observatory and the Institute of Public Health in Ireland).

In the PA report these different projections are combined by translating the incidents or cases of the disease into a volume of admissions for the appropriate disease groups. The volume of admissions is then combined over the period from 2005 to 2021 to give a yearly inflator for epidemiological change that can be applied to any health care sector. Unfortunately, the PA projections were not disaggregated by age group thus a single inflator is applied across age groups. This is clearly not ideal since disease prevalence may be changing at very different rates across age groups but the simplification is unavoidable. It is also very difficult to know whether this set of indicators gives a reliable measure of the impact of epidemiological change on the different areas of health care.

Figure 1.1 shows the results of the analyses of epidemiological change. The overall pattern is one of increasing disease prevalence across the period with the overall rate increasing by 12 per cent between 2007 and 2021. The increase in prevalence is larger for men than women with the former expected to experience an increase of 14 per cent compared to 10 per cent among women. Decomposition of the increase shows that a large proportion of the change, around 80 per cent comes from projected increases in cancer prevalence and particularly prostate, liver, kidney and breast cancers. As most cancers occur in those over the age of 65 years, lack of disaggregation by age group could underestimate the extent of increase.

Figure 1.2: Projected Increase in Morbidity 2007-2021



Source: Own analyses of PA Consulting Group (2007b).

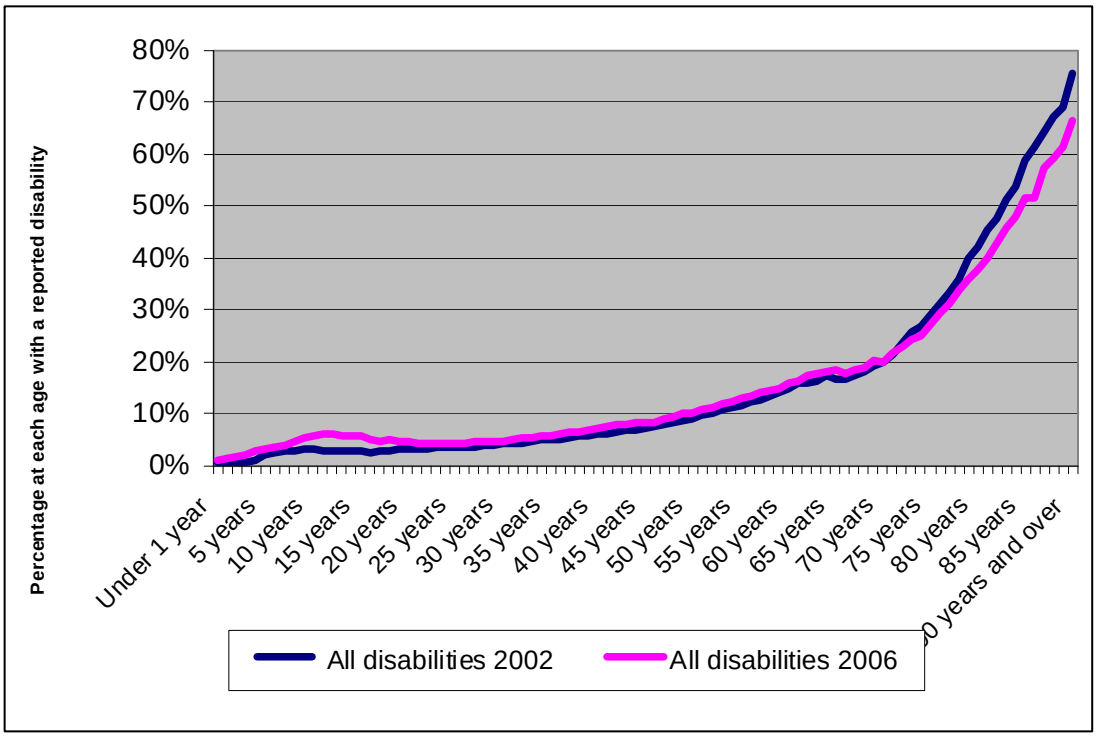
EPIDEMIOLOGICAL PROJECTIONS FOR TRENDS IN DISABILITY

Severe disability is generally considered a reasonable proxy for the need for long-term care, thus defining and measuring disability is important in assessing LTC demand (Schulz, 2004). A central question for planning health and social services is whether increased life expectancy will be

matched by increased years lived in good health. In the international literature, theorists have suggested three possible outcomes: first, that morbidity and disability rates remain the same at specific ages so extended lifespan is associated with extended morbidity; second, poor health and disability appear at later ages but the extension of lifespan has an upper limit leading to a compression of morbidity; third, both average lifespan and age of onset of poor health or disability continue to extend, leading to deferral of disability.

Although the balance of opinion currently supports this third view, cross-country evidence is mixed (Fogel and Costa, 1997; Manton and Gu, 2001; Cutler, 2001; OECD, 2007). Even if disability is deferred, the critical question for LTC demand is whether this deferral is of equal, greater or lesser duration than extended life expectancy, accordingly keeping constant, decreasing or increasing LTC demand relative to the population of older people. The first comprehensive, longitudinal evidence on national disability trends has been supplied by the Census of Population of 2002 and 2006 and supports an optimistic view of the evolution of disability in Ireland. The 2006 National Disability Survey provides data on the incidence of severe disability by age.

Figure 1.3: Percentage of Population with a Disability by Year of Age, 2002 and 2006



Source: *Census of Population Disability Volumes, 2002 and 2006.*

Although *Census 2006* records disability in the overall population at 9.3 per cent compared to 8.3 per cent in *Census 2002* and increased overall disability prevalence in every year of age up to 71 years, it shows reduced prevalence in every year above 71 years. An expansion in 2006 of specified long-lasting disabling conditions is suggested as sufficient explanation for the increase in disability recorded in the population overall.

Such changes in the Census questions do not explain the reduced prevalence of disability at higher ages in 2006. For conditions where the

Census questions remain unchanged, such as impairments of sight and hearing, while there is a marginal drop in disability prevalence overall and in most younger ages, this becomes more marked as age increases. In the case of conditions that substantially limit basic physical activities, there is also an overall decline in disability. Other measures of disability that show similar declines in age-specific prevalence, which broadly increase with greater age, are difficulty in: learning, remembering or concentrating; dressing, bathing or getting around inside the home; or going outside the home alone to shop or visit a doctor's office.

These reduced disability rates at older ages between 2002 and 2006 are important trends in projecting future LTC demand. This improvement is not unexpected given improved life expectancy (Morgenroth, 2009) and could be attributable to many factors: growth in income per capita; improved educational attainment; and improved access to and greater investment in health and social care. In this report the evidence from the two Censuses is employed to construct a range of disability rate forecasts for 2007-2021 which in common with other studies of future LTC demand (Wanless, 2002; Department of Social and Family Affairs, 2002), employs a range of assumptions about the evolution of disability (see Chapter 6).

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2. ACUTE PUBLIC HOSPITAL SERVICES: CHALLENGES FOR REFORM IN THE CONTEXT OF THE 'PREFERRED HEALTH SYSTEM'

Jacqueline O'Reilly, Aoife Brick, Miriam Wiley

2.1 Introduction

The starting point for this chapter differs to others in this report. In 2007, PA Consulting Group, in a report commissioned by the Health Service Executive (HSE), published projections for acute hospital bed capacity (PA Consulting Group, 2007a).[1] The projections presented in this report were estimated in the context of the Transformation Programme within which the HSE has clearly committed to an "integrated health system" (PHS) achieved through a redirection of health services from acute hospitals to primary and community care (Health Service Executive, 2006; 2008). This model is also consistent with the Health Strategy *Quality and Fairness: A Health System for You* published by the Department of Health and Children (2001).

The PA Consulting Group (2007a) report estimated that, if current practices regarding the use of acute hospital bed capacity were to continue, 19,822 public patient hospital beds would be required by 2020 (compared with the existing stock of 11,660 available in 2007 (PA Consulting Group, 2007a, p47). The alternative model estimated in this report was based on

[1]The acute hospital bed capacity projections presented in the PA Consulting Group (2007a) differentiate public and private hospital bed requirements. Our analysis in this paper is based on data from acute public hospitals which treat both public and private patients.

the preferred (or integrated) health system.[2] For this alternative model, the report estimates that just 8,834 public patient beds would be required by 2020.[3]

Given the adoption of the PHS as HSE policy and the projections for acute public patient hospital bed capacity presented in the PA Consulting Group (2007a) report, in this chapter we attempt to provide some analysis of a range of demand- and supply-side factors influencing acute public hospital services provision in moving to the PHS.[4] In particular, this chapter concentrates on two key assumptions which are integral to the PHS projections of acute hospital bed capacity put forward by the PA Consulting Group (2007a), specifically, the importance of increasing day case activity and reducing inpatient length of stay over the period of the projections.[5] Over three-quarters of the savings in bed numbers between the two models estimated by the PA Consulting Group (2007a) have been attributed to the proposed reduction in inpatient length of stay and increasing day case activity.[6] In the subsequent sections, the potential for increasing day surgery and reducing the duration of hospitalisations is considered by exploring the variability across hospitals, as well as exploring the effects of patient and hospital characteristics. The analysis in this chapter predominantly draws on data from the Hospital In-Patient Enquiry (HIPE) Scheme, which is described together with the methods in the following section.[7]

2.2 Data and Methods

The main data source on which this analysis draws is the Hospital In-Patient Enquiry. As the only source of national morbidity data available for acute public hospital services, the HIPE Scheme collects data on discharges from, and deaths in, acute hospitals throughout the Republic of Ireland. While day and inpatient activity is captured through HIPE, visits to Emergency Departments and outpatient clinics are not. Coverage of discharges from hospitals participating in HIPE has consistently been at 94 per cent or above since the mid-1990s.[8] The absence of a unique health identifier in the Irish health system means that the unit of measurement in HIPE and for this analysis is the discharge, not the patient.

This analysis principally focuses on discharges during 2006, captured by HIPE.[9] Estimates indicate that almost 97 per cent of discharges that occurred in 2006 were reported to HIPE (Health Research and

[2]As the 'Integrated Health System' was referred to as the 'preferred health system' (PHS) in the PA Consulting Group (2007a) report, this is the term most generally used in this chapter.

[3] While we take this report as the starting point for our analysis here, we do not in any way attempt any validation of the findings or the conclusions of the PA Consulting Group (2007a) report.

[4]For the purposes of this analysis, a hospital is defined as acute if the inpatient average length of stay is 30 days or less. Private hospitals are outside the scope of this review.

[5] Throughout this chapter, the terms 'day case' and 'day patient' are used interchangeably.

[6]Of these two factors, reducing inpatient length of stay alone accounts for almost 60 per cent of projected bed savings.

[7]The authors would like to express their gratitude to colleagues at the ESRI's Health Research and Information Division for their assistance in preparing this chapter. Specifically, we would like to thank Barbara Clyne, Jacqui Curley, Brian McCarthy, Shane McDermott, Deirdre Murphy, Sinead O'Hara and Eithne Sexton for their invaluable contributions.

[8]Underreporting of discharges tends to be more prevalent among large hospitals with high volumes of activity.

[9]In addition, data from 2000 were used for comparative purposes in subsequent sections.

Information Division ESRI, 2008).[10] In addition to administrative (for example, admission and discharge dates, and medical card and public/private status) and demographic (sex, age) data on discharges, clinical data on discharges in 2006 were recorded in HIPE using *The International Statistical Classification of Diseases and Related Health Problems*, Tenth Revision, Australian Modification (ICD-10-AM).[11] In total, 20 diagnosis (one principal and up to 19 additional) codes and, where applicable, 20 procedure (one principal and up to 19 additional) codes could be recorded for these discharges.[12] As the focus of this chapter is acute public hospitals, a small number of hospitals outside of this classification were excluded.[13] In total, 51 acute public hospitals were included in the following analysis.[14]

As previously mentioned, the analysis in this chapter focuses on two assumptions central to the acute hospital bed capacity projections presented in the PA Consulting Group (2007a) report, i.e. the importance of increasing day case activity and reducing inpatient length of stay if the projections within the context of the PHS are to be achievable. In the first part of this analysis, day case rates are compared both within and across hospitals using a basket of procedures. The original basket of 20 procedures was developed by the Audit Commission in conjunction with the Royal College of Surgeons and subsequently revised in consultation with the British Association of Day Surgery to incorporate 25 procedures (Healthcare Commission, 2005) (see Appendix 2.1 for the approach adopted). For the purposes of this research, 24 of these procedures were adapted for Ireland using expert advice from the Clinical Coding Team in the Health Research and Information Division at the ESRI.[15]

The key parameter in the second analytical strand of hospitals' inpatient length of stay is standardised length of stay (first developed by Martin and Smith (1996)). This parameter is the ratio of the observed length of stay for each discharge to the length of stay that would be expected at a national level, given the discharge's age, sex and diagnosis related group (AR-DRG).[16] Thus, a value of unity indicates that a discharge's actual length of stay is exactly equal to that which would be expected; while a value greater (less) than unity implies that the actual length of stay was greater (less) than the national average for comparable cases.

[10] Day patient radiotherapy and dialysis encounters were collected in HIPE for the first time in 2006.

[11] This coding classification scheme applied to discharges from 1 January 2005. Prior to the move to ICD-10-AM, The International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) was used. The move from ICD-9-CM to ICD-10-AM also entailed changes to coding guidelines (such as the definition of additional diagnoses). Consequently, the ICD-9-CM and ICD-10-AM coding schemes are not directly comparable. For a detailed discussion of updating the clinical coding classification in Ireland, see Murphy *et al.* (2004).

[12] The potential number of additional diagnosis and procedure codes captured by HIPE has increased from five (diagnoses) and three (procedures) prior to 2002 to nine (for both diagnoses and procedures) until 2005 when the number increased to 19 diagnosis and procedure codes.

[13] Eight public hospitals (predominantly long-stay hospitals) and two private hospitals were excluded. These hospitals accounted for a small proportion of total discharges reported to HIPE.

[14] To preserve anonymity, each hospital was randomly assigned a code between 1 and 51.

[15] The procedure 'termination of pregnancy' is not applicable for Ireland.

[16] The standardised length of stay for discharge i in age group j, sex k and AR-DRG x is the observed length of stay for discharge i divided by the national mean length of stay of discharges in age group j and sex k in AR-DRG x. The age groups were five-year categories (0-4 years, 5-9 years, etc.) up to 85 years and over. The Australian Refined Diagnosis Related Group (AR-DRG) system is a casemix classification system which enables the disaggregation of patients into homogeneous groups which are expected to undergo similar treatment processes and incur similar levels of resource use.

2.3 Overview of Day Case Activity Within the Acute Public Hospital

According to the PA Consulting Group (2007a) report, the number of public patient day beds required in the context of an operational PHS will amount to 3,160 by 2020. Given this volume of day beds, together with a projected population of over 5 million, acute public hospitals in 2020 would have the potential capacity to treat between 195 and 230 per 1,000 members of the population on a day case basis depending on bed occupancy rates.[17] These projected discharge rates for 2020 would represent growth of between 25 per cent and 47 per cent compared to the 2006 day case discharge rate of 156.2 per 1,000 (Health Research and Information Division ESRI, 2008). Although substantial, such levels of growth are not unprecedented among Irish acute public hospitals. Between 1995 and 2006, the day patient discharge rate increased by over 248 per cent from 44.9 per 1,000 (HIPE & NPRS Unit ESRI, 2002). Such substantial increases have been attributed to a range of factors including changes in clinical practice facilitated by the advancement of medical technology and the availability of resources (particularly day beds). In attempting to explore the challenges that may arise in achieving the objectives for day case activity for 2020, a more detailed analysis is presented here of variations in day case rates for specific procedures and at the individual hospital level.

A day patient in HIPE is defined as a planned case admitted and discharged as scheduled on the same day. The day case rate is measured here as the number of day patients treated, expressed as a percentage of the total number of day patients and elective inpatients combined. This follows the Audit Commission (2001) method for measuring day case performance.

Figure 2.1 shows the day case rate and day beds as a proportion of total beds by hospital for all elective discharges in 2006.[18] In this analysis, day beds are reported as a proportion of total beds to control for the size of the hospital in question and to give a more accurate picture of the hospitals' day case activity.

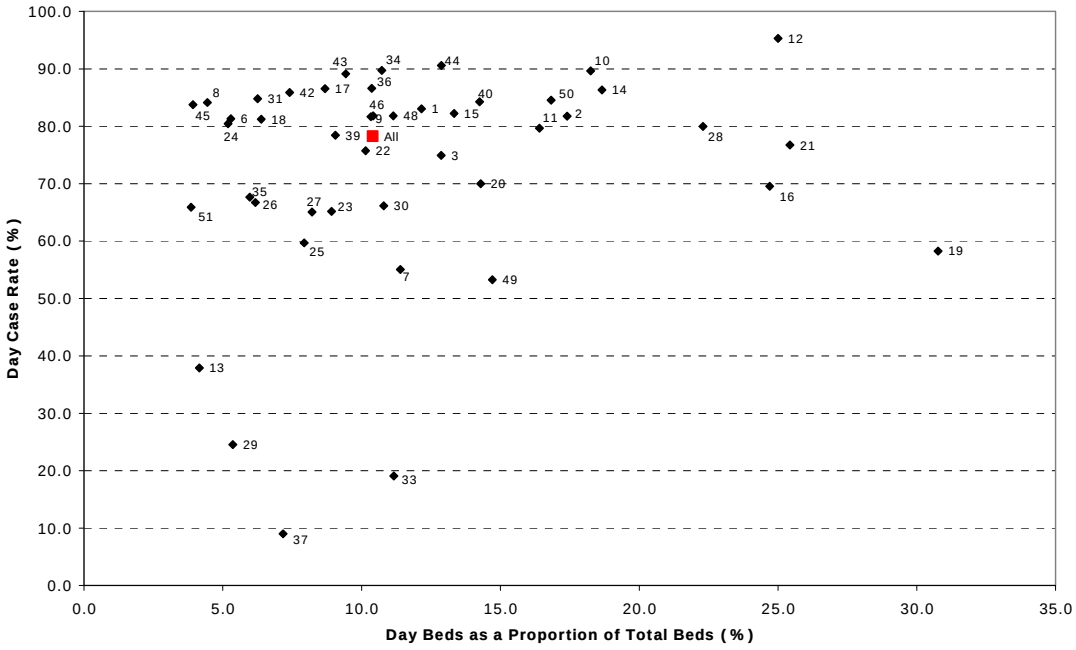
In 2006, the day case rate across the selected hospitals was 78.2 per cent of all elective activity and the day bed rate was 10.4 per cent. There is variation across hospitals. For example, in 2006, hospitals 48 and 7 had similar proportions of day beds with 11.1 and 11.4 per cent respectively but hospital 48 had a day case rate of 81.8 per cent and hospital 7 had a day case rate of 55.0 per cent.

The variation in day case rates across hospitals with similar proportions of day beds would suggest that the achievement of national objectives in relation to day case rates may need a more targeted intervention where the rates for individual hospitals are lower than would be expected given the capacity available.

[17]The discharge rate would be 195 per 1,000 at 85 per cent bed occupancy or 230 per 1,000 at 100 per cent bed occupancy.

[18]The number of day beds in 2006 was sourced from the Performance Management Unit, Health Service Executive.

Figure 2.1: Day Case Rate (%) and Day Beds as a Proportion of Total Beds (%) by Hospital, 2006



To probe further into the source of variation in day case activity at the hospital level, an analysis of day case rates within hospitals for individual procedures was undertaken. The following analysis, using HIPE data for 2006, employs a basket of 24 procedures (Basket 24) as a means of comparing day case performance across the 51 acute public hospitals included (Audit Commission, 2001).[19]

Table 2.1 shows the day case rate for the Basket 24 procedures in 2006 which were specified using the ICD-10-AM coding scheme. The overall day case rate is presented along with the median rate across the 51 hospitals. In addition, it shows the number of hospitals carrying out each procedure, though it should be noted that not every procedure is carried out in every hospital. For example, the procedure 'excision of ganglion' is carried out in 43 hospitals whereas 'correction of squint' is carried out in 11 hospitals. For two hospitals of the 51 included in the analysis, no Basket 24 procedures were performed.

Of the Basket 24 procedures, the highest volume procedures were 'dilation and curettage/hysteroscopy' with 7,997 procedures performed in 35 hospitals and 'extraction of cataract with/without implant' with 7,989 procedures performed in 11 hospitals. Almost three quarters of all 'dilation and curettage/hysteroscopy' procedures (73.9 per cent) and over half of all 'extraction of cataract with/without implant' procedures (56.8 per cent) were performed as day cases. The lowest volume procedure in the Basket 24 was 'operation for bat ears' with 220 procedures performed in 2006. There is variation in the day case rate across the 24 procedures, from a low of 0.4 per cent for 'tonsillectomy' to a high of 95.6 per cent for 'myringotomy with or without grommets'.

[19]See Appendix 2.1 for the approach adopted.

Table 2.1: Day Case Rate for Basket 24 Procedures, 2006

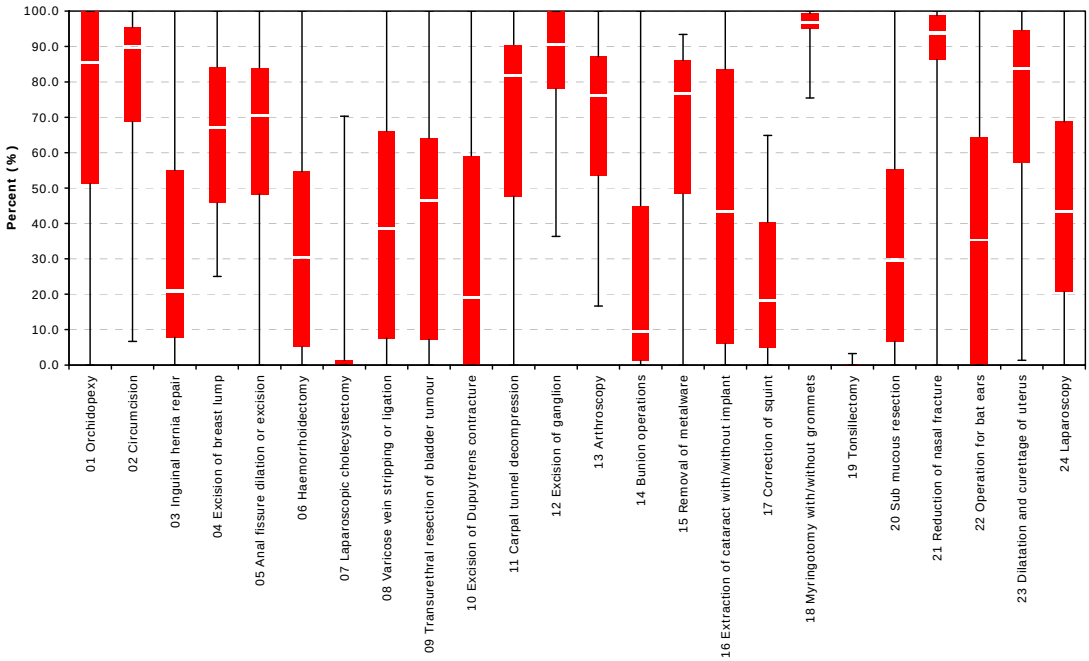
Specialty[a]		Number of Hospitals	Day Patients N	Day Case Rate (Total %)	Day Case Rate (Median %)	Total Discharges[b]
General surgery and urology	01 Orchidopexy	26	387	75.0	85.6	516
	02 Circumcision	38	2,537	87.0	89.9	2,916
	03 Inguinal hernia repair	38	1,162	32.3	21.0	3,603
	04 Excision of breast lump	36	1,228	56.2	67.1	2,184
	05 Anal fissure dilation or excision	37	479	73.6	70.6	651
	06 Haemorrhoidectomy	36	138	34.9	30.4	395
	07 Laparoscopic cholecystectomy	36	173	5.3	0.0	3,279
	08 Varicose vein stripping or ligation	35	1,228	49.7	38.6	2,471
	09 Transurethral resection of bladder tumour	23	243	38.9	46.4	625
	10 Excision of Dupuytren's contracture	25	83	26.9	19.1	309
Orthopaedics	11 Carpal tunnel decompression	35	955	77.0	81.8	1,240
	12 Excision of ganglion	43	346	85.2	90.6	406
	13 Arthroscopy	27	3,886	71.6	76.0	5,427
	14 Bunion operations	23	87	15.3	9.5	569
	15 Removal of metalware	27	2,675	78.0	76.7	3,429
Ophthalmology	16 Extraction of cataract with/without implant	11	4,538	56.8	43.4	7,989
	17 Correction of squint	11	126	24.3	18.2	519
Ear, nose and throat	18 Myringotomy with/without grommets	20	3,796	95.6	96.8	3,970
	19 Tonsillectomy	20	11	0.4	0.0	2,875
	20 Submucous resection	20	163	29.5	29.7	553
	21 Reduction of nasal fracture	19	1,024	89.4	93.8	1,146
	22 Operation for bat ears	17	120	54.5	35.3	220
Gynaecology	23 Dilation and curettage/hysteroscopy	35	5,911	73.9	83.7	7,997
	24 Laparoscopy	43	3,186	57.4	43.3	5,555
	Total	51	34,482	58.6	54.4	58,844

Notes: [a] Procedures are numbered and grouped by specialty in line with the Healthcare Commission (2005) where it is stressed that specialty groups are indicative and some procedures may be carried on in a different specialty.

[b] Includes day patients and elective inpatients.

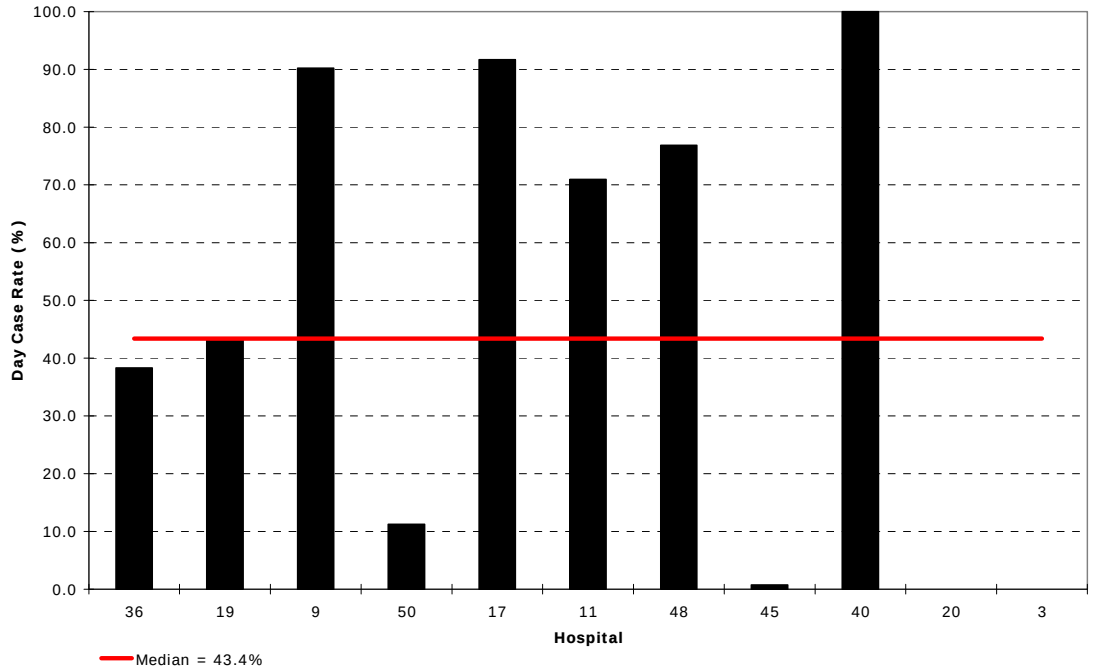
Figure 2.2 summarises the spread of day case rates across 49 hospitals for each of the Basket 24 procedures. When individual procedures from the Basket 24 are examined across all hospitals performing the procedure, it is clear that there is wide variation in day surgery rates for any particular Basket 24 procedure.

Figure 2.2: Day Case Rate (%) for Basket 24, 2006



For example, 'extraction of cataract with/without implant' is a high volume procedure with a median day case rate of 43.4 per cent (mean=56.8 per cent). In 2006, the procedure was performed on a day or inpatient basis in 11 hospitals; all of which performed more than 15 procedures in total (day and elective inpatients). Figure 2.3 shows the day case rate for each of the 11 hospitals where the procedure was performed. In 2006, the day case rate ranged from zero for hospitals 3 and 20 to 100 per cent for hospital 40. Even where hospitals are performing similar volumes of procedures as day cases, the day case rate can vary widely. Hospitals 11 and 19 performed 618 and 551 'extraction of cataract with/without implant' procedures respectively; however, hospital 11 had a day case rate of 71.0 per cent for the procedure whilst hospital 19 had a day case rate of 43.4 per cent. Similar variation, to a greater and lesser extent, can be found for all of the Basket 24 procedures.

Figure 2.3: Day Case Rate (%) for 'Extraction of Cataract With/Without Implant', 2006



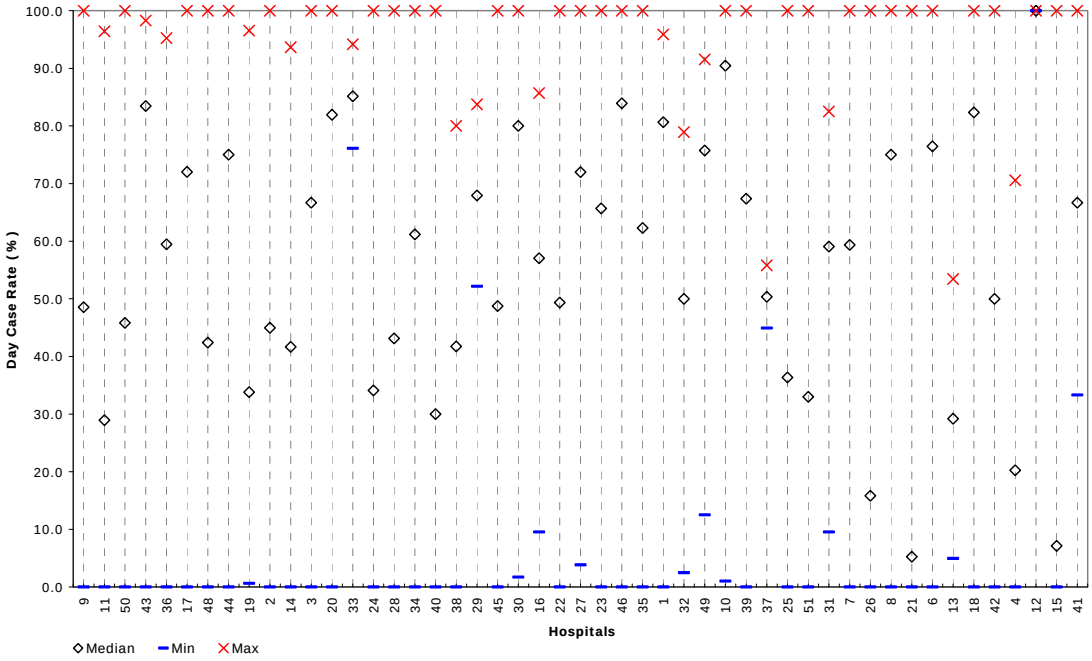
Given the low day case rates for procedures such as 'laparoscopic cholecystectomy' the appropriateness of the Basket 24 and its application in an Irish context may be called into question. However, although the average day case rate for this procedure is 5.3 per cent, many hospitals are achieving day case rates far in excess of this. In 2006, three hospitals (6, 34 and 43) achieved day case proportions above 20 per cent.[20]

Figure 2.4 shows the minimum, maximum and median day case rate across the Basket 24 procedures for each hospital, in descending order of the total number of procedures performed. It is clear that, as well as large variations in the day case rate for the Basket 24 procedures in hospitals, there was also variation in the day case rates between the procedures within the hospitals in 2006. A particular hospital can have a high day case rate for one procedure and a low rate for another. For example, hospital 11 has a day case rate of 20.7 per cent for 'orchidopexy' and 62.6 per cent for 'circumcision'.

Few of the hospitals performed well for all of the procedures delivered from the Basket 24, and those that did perform well are generally not performing a wide range of the procedures. For example, hospital 33 appears to perform well as the minimum, maximum and the median for the Basket 24 are over 75 per cent. However, this hospital carries out just 2 of the Basket 24 procedures. The majority of the 49 hospitals, performing one or more of the Basket 24 procedures, have at least one procedure for which all discharges are day cases and at least one for which all discharges are elective inpatients.

[20]Hospital 6 achieved a day case rate of 23.4 per cent out of a total of 141 procedures performed. Hospital 34 achieved a day case rate of 21.6 per cent out of 97 procedures performed. Hospital 43 achieved a day case rate of 70.3 per cent out of a total of 111 procedures performed.

Figure 2.4: Day Case Rate for the Basket 24 Procedures by Hospital, 2006



The number of additional day cases that could potentially be achieved in 2006 if each hospital was performing at the upper quartile level was calculated for each of the Basket 24 procedures. If all hospitals in 2006 were performing this set of day case procedures at the upper quartile day case rate for each Basket 24 procedure, the number of day cases, in place of elective inpatient cases, would have been 15.2 per cent (8,926 cases) greater than that actually achieved in 2006. The savings varied between procedures with 'cataracts' procedures allowing for the greatest scope in the reduction of elective inpatient cases and consequently beds days. If all hospitals carrying out 'cataracts' in 2006 achieved the 2006 upper quartile day case rate of 83.6 per cent, it would have meant 2,137 of the elective inpatients being treated instead as day cases. Thus, of the potential additional 8,926 day cases, 23.9 per cent are accounted for by 'cataracts' patients.

If such performance were possible, this would in turn lead to a fall in the number of elective inpatient bed days. If we make the assumption that all hospitals achieved the upper quartile day case rate in 2006 and the average length of stay for the remaining elective inpatients remained the same as it was prior to the day case improvements, there would have been 20,636 (21.7 per cent) fewer elective inpatient bed days required. If a day case rate of 100 per cent were achieved for each of the Basket 24 procedures 36,367 bed days (38.2 per cent) would have been saved in 2006.

This evidence presented here supports the assumption that there is potential to increase day case activity as part of the PHS model. The variation observed between hospitals and across procedures would suggest, however, that the achievement of the proposed targets may necessitate customisation of this policy for individual hospitals and for specific procedures.

2.4 Overview of Inpatient Length of Stay Within the Acute Public Hospital Sector

A reduction in inpatient length of stay in acute public hospitals is a key assumption underlying the projection by PA Consulting Group (2007a) that public patient bed requirements may be reduced by 2020 in the context of the PHS.[21] The importance attributed to this development may be deduced from the fact that almost 60 per cent of the difference in the public patient bed capacity projections for the 'current use' and the PHS models are attributed to a reduction in inpatient length of stay.

The purpose of this section is to use hospital inpatient discharge data from HIPE to investigate the demand- and supply-side factors that may influence the duration of hospitalisation. The complex interactions between patient characteristics and the parameters of the hospital system prompted Martin and Smith (1996) to issue a warning to policy makers looking for "easy ways" to reduce utilisation of hospital services.

For acute Irish public hospitals, inpatient average length of stay has fallen from 7.2 days in 1995 to 6.3 days in 2006 (Health Research and Information Division ESRI, 2008). [22] In order to present some context for the length of stay targets proposed for the PHS in the PA Consulting Group (2007a) report, this section benchmarks hospitals' current performance on inpatient length of stay for selected procedures against that required under the PHS in 2020. Given the data available in the PA Consulting Group (2007a) report, this analysis focuses on the following subset of conditions and procedures which are likely to become increasingly important as the population ages:

- Acute myocardial infarctions (AMIs);
- Arrhythmias;
- Hernia repairs;
- Hip procedures;
- Diabetes.[23]

Table 2.2 reports the average length of stay for acute inpatients as reported to HIPE in 2006 and projected under the PHS in 2010 and 2020. In an attempt to ensure comparability with the analytical approach used in PA Consulting Group (2007a), this Table focuses on inpatients with a length of stay of 30 days or less. For each of the five conditions, the move to the PHS requires substantial reductions in inpatient length of stay

[21]While reducing inpatient length of stay enables hospitals to treat more patients with a given number of beds, it does not necessarily follow that there will be a concomitant fall in total costs. In a systematic literature review, Clarke (1996) argued that a disproportionately large share of the costs of inpatient stays is accumulated during the early part of the stay when intensive treatment and investigation occur. The effect of early discharge on clinical outcomes and patient satisfaction must also be considered (Spencer *et al.*, 2004; Clarke, 1996).

[22]For acute inpatients (that is, those with a length of stay of 30 days or less), the average length of stay has fallen from 5.5 days in 1995 to 4.8 days in 2006.

[23] The AR-DRG codes for AMIs are F41A, F41B, F60A, F60B, F60C. The AR-DRG codes for Arrhythmias are F70A, F70B, F71A and F71B. The AR-DRG codes for hernia repairs are G08A, G08B and G09Z. The AR-DRG codes for hip procedures are I03A, I03B and I03C. The AR-DRG codes for diabetes are K60A and K60B. This categorisation was adopted in the PA Consulting Group (2007b) report.

between 2006 and 2020 of the order of approximately 25 per cent for hip procedures, 30 per cent for diabetes, about 40 per cent for arrhythmias and hernia repairs, and over 47 per cent for AMI. That the achievement of these objectives may be challenging may be deduced from the finding that during the period 1995 to 2006, the national acute inpatient average length of stay fell by about 13 per cent.

Table 2.2: Average Length of Stay for Acute Inpatients, Recorded for 2006 and Projected for 2010 and 2020

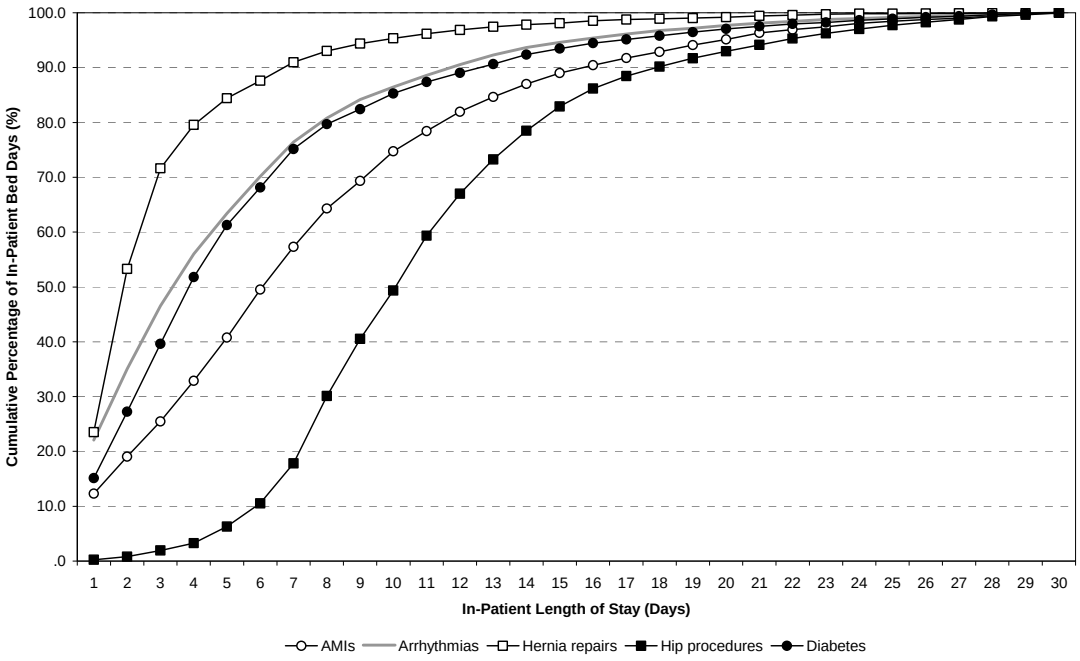
	Number of Acute Inpatients in 2006	Average Length of Stay (Days)		
		2006 *(Observed)*[a]	2010 *(PHS Target)*[b]	2020 *(PHS Target)*[b]
AMIs	4,270	7.8	6.1	4.1
Arrhythmias	6,625	5.4	4.7	3.2
Hernia Repairs	3,997	3.5	2.9	2.2
Hip Procedures	5,040	11.5	11.5	8.6
Diabetes	4,060	5.9	6.1	4.1

Note: [a] These figures were calculated by the authors and, therefore, may be slightly different to those reported by PA Consulting Group (2007b). However, these differences are unlikely to substantially affect the subsequent analysis.

Source: [b] PA Consulting Group (2007b).

To enable an assessment of variation in this indicator for these conditions at the hospital level, Figure 2.5 illustrates the cumulative distribution of acute in-patient average length of stay across all hospitals. It is interesting to note that the duration of hospitalisation for approximately one out of every two acute in-patient discharges with diabetes, arrhythmia, or hernia repair actually surpassed the 2020 target. For AMIs and hip procedures, however, only about one-third and two-fifths of acute in-patient discharges, respectively, achieved or surpassed the 2020 target under the PHS. This would suggest therefore, that optimisation of progress towards the 2020 target would be enhanced if efforts to reduce in-patient length of stay focussed more on areas such as AMIs and hip procedures, though there are still potential improvements to be made in the other three areas.

Figure 2.5: Cumulative Distribution of Acute Inpatient Length of Stay for Five Conditions, 2006



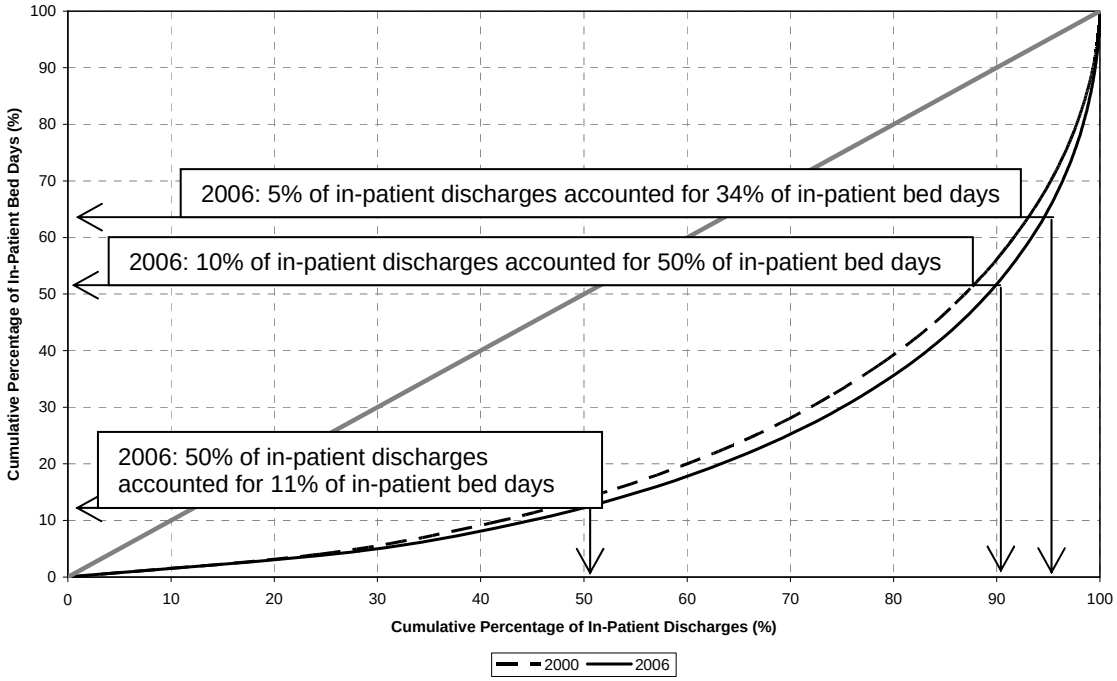
The remainder of this section examines how demand-side factors, such as patients' demographic characteristics, affect length of stay by comparing high users with other users. In what follows, "high users" are described as those in-patient discharges in the 90th percentile of the in-patient bed days distribution.[24] On the basis of this definition, there were 56,533 high users in 2000 who accounted for 45.8 per cent of total in-patient bed days. The absolute number of high users was slightly higher in 2006 (61,899) and they accounted for a higher percentage of bed days (49.8 per cent).[25]

Figure 2.6 compares the cumulative distribution of in-patient bed days and discharges in 2000 and 2006. If there was a one-to-one relationship between in-patient bed days and discharges (for example, 40 per cent of discharges accounted for 40 per cent of bed days), the data would lie along the solid grey diagonal line in the figure. Instead, the lines for 2000 and 2006 indicate an unequal relationship, with a small proportion of in-patient discharges using a disproportionately large share of bed days. Thus, in 2000, approximately 88 per cent of in-patient discharges used as many bed days as the remaining 12 per cent of in-patient discharges (that is, 50 per cent of total in-patient bed days were used by 88 per cent of in-patient discharges, and the other 50 per cent of bed days were used by the remaining 12 per cent of discharges).

[24]Recall that this analysis is based on discharge level data. Therefore, a single patient may account for a number of high user discharges.

[25]For comparison, 10 per cent of inpatients in Scotland accounted for 59 per cent of overall inpatient bed days in 2003/4 (National Health Service Scotland, 2005).

Figure 2.6: Cumulative Distributions of Inpatient Discharges and Bed Days, 2000 and 2006



In Figure 2.6, the 2006 line was positioned slightly further away from the diagonal than the 2000 line. This indicates a marginal increase in the existing inequality between in-patient bed days and discharges in 2006 compared to 2000 (which is also evident from the fact that in 2006, approximately 89 per cent of in-patient discharges used as many bed days as the remaining 11 per cent).

The characteristics of high users are compared to other users in 2000 and 2006 in Table 2.3. There were obviously stark differences between the two groups in their average length of stay: in 2006, high users were, on average, staying in hospital for over eight times as long as other users. As age has been consistently found to be an important determinant of length of stay (see, *inter alia*, McMullan *et al.,* 2004; Spencer *et al.,* 2004; Rochon *et al.,* 1996), it is not surprising that high users tend to be much older, on average, than other users (62.1 years versus 40.0 years in 2000 and 64.2 years versus 40.8 years in 2006). The high user group is also characterised by a higher proportion of medical card holders (GMS).

Pre-existing illnesses have a substantial impact on length of stay (Rochon *et al.,* 1996; Roe *et al.,* 1998)). In this analysis, the proportion of discharges with more than 2 diagnoses provides an indication of the level of comorbidity. About eight out of every ten high users had more than 2 diagnoses recorded, which in both years was far higher than the corresponding percentage for other users. A substantially higher proportion of high user discharges underwent more than two procedures. Moreover, the proportion of high users grouped into the highest category of resource intensity was more than double that for other users in 2006.[26] Finally, Table

[26]Resource intensity is determined by the level of complexity associated with the AR-DRG to which the case is assigned.

2.3 also shows that, although the percentages are small in absolute terms, high users were more likely to be discharged to long-stay accommodation.

Table 2.3: Characteristics of High Users and Other Users, 2000 and 2006

		2000		2006	
		High Users	Other Users	High Users	Other Users
N[a]		56,533	460,365	61,899	513,776
Inpatient bed days (%)		45.8	54.2	49.8	50.2
Inpatient average length of stay (days)	Mean	25.3	3.7	28.5	3.5
	(SD)	25.0	2.8	32.4	2.8
	Median	18.0	3.0	20.0	2.0
	(IQR)	(15.0, 27.0)	(1.0, 5.0)	(15.0, 30.0)	(1.0, 5.0)
Age (years)	Mean	62.1	40.0	64.2	40.8
	(SD)	22.7	25.3	22.7	25.2
GMS (%)[b]		57.1	40.4	70.8	42.7
Public (%)[c]		78.6	75.7	78.1	72.9
Surgical diagnosis related group (%)[d]		34.6	24.1	31.1	23.7
Highest resource intensity category (%)[e]		-	-	39.9	17.0
More than 2 diagnoses (%)[f]		77.6	43.3	85.2	47.7
More than 2 procedures (%)[f]		49.2	19.8	62.9	19.3
Discharged to long-stay accommodation (%)[g]		12.3	1.7	15.8	2.3

Notes: SD, standard deviation. IQR, interquartile range between the 25th and 75th percentiles.

[a] Refers to number of discharges, not patients.

[b] Entitlement to a medical card changed in July 2001. Medical card status 'unknown' were included in the calculation of these percentages.

[c] Refers to public/private status on discharge. Does not relate to the type of bed occupied by the discharge.

[d] Certain DRGs are considered to be surgical for the purposes of assigning discharges to groups of homogeneous discharges.

[e] Based on the resource intensity of the DRG to which a discharge is allocated. This categorisation became available with the move to AR-DRGs in 2005 and, therefore, was not available for 2000.

[f] In 2000, diagnoses and procedures were coded using ICD-9-CM. A potential maximum of six (one principal and up to five secondary) diagnosis codes and four (one principal and up to three secondary) procedure codes could be reported to HIPE in 2000. Since 1 January 2005, ICD-10-AM is used to code diagnoses and procedures in HIPE. A total of 20 potential diagnosis and procedure codes could be reported to HIPE in 2006.

[g] Includes convalescent home, nursing home or long-stay accommodation.

The ten AR-DRGs with the highest number of inpatient discharges for high users and other users in 2006 are reported in Table 2.4. The top ten AR-DRGs for high users accounted for almost one-fifth of total inpatient bed days for all high users and 17.2 per cent of high user discharges.

The top ten AR-DRGs for high users shows that inpatient bed days among this group were predominantly used for chronic conditions, or acute episodes associated with chronic conditions – for example, stroke and chronic obstructive airways disease. Acute conditions were more likely to be recorded among other users.

The AR-DRGs associated with the higher levels of severity (as denoted by a fourth character of 'A' in the AR-DRG code) were more common among high users. That high users are complex discharges was also evident

from the higher mean casemix units assigned to these cases.[27] High users in the top ten AR-DRGs were four times more resource intensive than the average across all AR-DRGs, while the corresponding other users were 60 per cent less complex than the national average.

Table 2.4: Top Ten AR-DRGs by Inpatient Bed Days for High Users and Other Users, 2006

AR-DRG	Description	In-Patient Discharges N	In-Patient Bed Days N	In-Patient Casemix Units N	In-Patient Casemix Units Mean
High users					
A06Z	Tracheostomy or Ventilation >95 hours	1,698	92,857	27,427	16.2
E65A	Chronic Obstructive Airways Disease W Catastrophic or Severe CC	1,334	33,969	2,414	1.8
I03C	Hip Replacement W/O Catastrophic or Severe CC	1,061	19,667	2,981	2.8
F62B	Heart Failure and Shock W/O Catastrophic CC	1,052	23,389	1,461	1.4
E75A	Other Respiratory System Diagnosis Age>64 W CC	1,017	26,148	1,586	1.6
B70C	Stroke W/O Catastrophic or Severe CC	966	28,823	1,836	1.9
E62A	Respiratory Infections/Inflammations W Catastrophic CC	966	32,436	2,703	2.8
E62B	Respiratory Infections/Inflammations W Severe or Moderate CC	936	25,273	1,643	1.8
I03B	Hip Replacement W Cat or Sev CC or Hip Revision W/O Cat or Sev CC	813	22,798	3,334	4.1
B70B	Stroke W Severe CC	805	29,665	2,189	2.7
Total – Top 10		**10,648**	**335,025**	**47,574**	**4.5**
Total – High Users		**61,899**	**1,763,992**	**191,730**	**3.1**
Other Users					
O60B	Vaginal Delivery W/O Catastrophic or Severe CC	33,031	99,828	15,870	0.5
O66A	Antenatal & Other Obstetric Admission	20,482	44,404	6,098	0.3
O01C	Caesarean Delivery W/O Catastrophic or Severe CC	12,508	64,814	13,028	1.0
F74Z	Chest Pain	12,111	31,491	3,769	0.3
O66B	Antenatal & Other Obstetric Admission, Sameday	10,383	10,383	882	0.1
O60C	Vaginal Delivery Single Uncomplicated W/O Other Condition	9,874	23,552	3,589	0.4
G66B	Abdominal Pain or Mesenteric Adenitis W/O CC	8,298	18,642	2,352	0.3
D63B	Otitis Media and URI W/O CC	8,277	16,827	2,284	0.3
G67B	Oesophagitis, Gastroent & Misc Digestive Systm Disorders Age>9 W/O Cat/Sev CC	7,926	25,679	3,012	0.4
G68B	Gastroenteritis Age <10 W/O CC	6,457	11,667	1,994	0.3
Total – Top 10		**129,347**	**347,287**	**52,878**	**0.4**
Total – Other Users		**513,776**	**1,777,768**	**382,077**	**0.7**

To summarise, in 2006 approximately 10 per cent of discharges accounted for about half the bed days used in acute public hospitals. These discharges, the so called high users, were older and sicker than other users. The high users were being treated for more complex conditions which were often associated with chronic conditions. While treatment in other care settings may be equally or more appropriate for many in this group,

[27] Casemix units are calculated by weighting discharges according to their level of resource intensity.

this analysis would suggest that an attempt to reduce bed day utilisation within the acute public hospital sector will have to ensure that an appropriate response to the needs of this potentially vulnerable group are specifically addressed.

2.5 Supply-Side Determinants of Length of Stay: Variability in Inpatient Average Length of Stay by Hospital

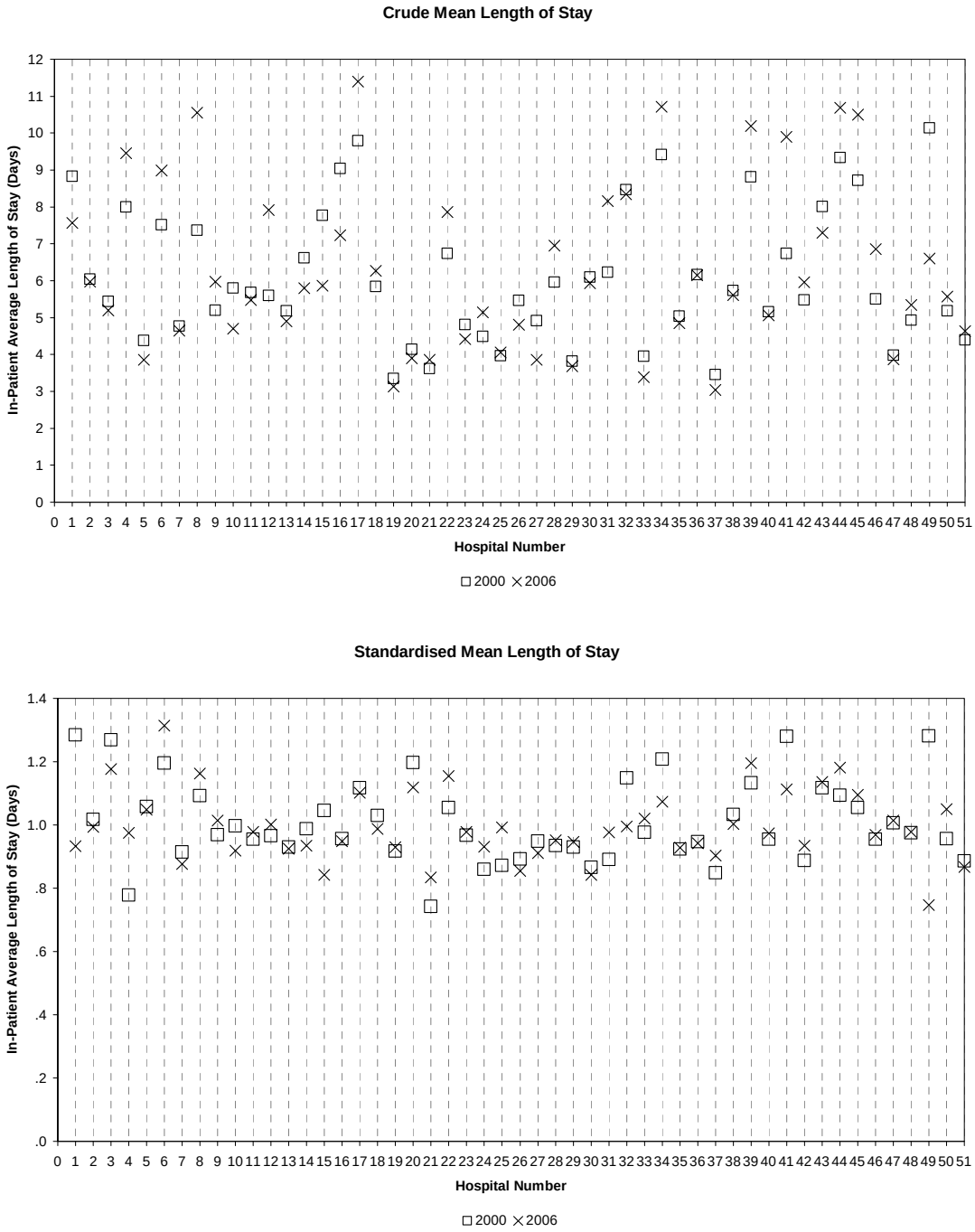
Research has found that unexplained variation in length of stay across hospitals persists after controlling for patient characteristics (Peterson *et al.,* 2002). The supply-side influences on length of stay are predominantly centred on those pertaining to the hospital (including, for example, teaching status (Yuan *et al.,* 2000), physician practices (McMullan *et al.,* 2004) and funding (Yuan *et al.,* 2000; Theurl and Winner, 2007).

The crude mean length of stay for each of the 51 acute public hospitals included in this analysis in 2000 and 2006 is shown in Figure 2.7. The crude mean length of stay ranged from 3.3 to 10.1 days in 2000 and from 3.0 to 11.4 days in 2006. The unadjusted figures do not control for differences in the case mix across hospitals. They do demonstrate, however, that while average length of stay at a national level declined over the period, this downward trend was not experienced by all hospitals (only 28 of the 51 hospitals shown in Figure 2.7 recorded a decline in mean length of stay between 2000 and 2006).

The mean standardised length of stay, also presented in Figure 2.7, makes some attempt to control for differing patient profiles across hospitals. Of the 51 hospitals, 21 (41.2 per cent) had a mean standardised length of stay above unity in 2000; by 2006 this number had slightly declined to 19 (37.3 per cent) hospitals. However, there was also a marginal increase in the share of inpatient discharges accounted for by those hospitals with a mean standardised length of stay of greater than unity (from 35.0 per cent of total inpatient discharges in 2000 to 40.5 per cent in 2006).

In both 2000 and 2006, the lowest mean standardised length of stay for any hospital was 0.7, indicating that the mean length of stay in that hospital was approximately 30 per cent below what would have been expected given the case mix of that hospital's discharges. At the other extreme, the highest hospital mean standardised length of stay was 1.28 in 2000 and 1.31 in 2006, suggesting that in these cases the mean length of stay was 28 per cent and 31 per cent respectively above what would have been expected.

Figure 2.7: Crude and Standardised Mean Length of Stay, 2000 and 2006



Given the considerable variation in the standardised length of stay across hospitals, it is interesting to explore the association between length of stay and hospital type. The mean standardised length of stay is shown in Figures 2.8 and 2.9 for general (voluntary, regional and county) hospitals and special hospitals in both 2000 and 2006. All voluntary, regional and county hospitals provide general hospital services, as distinct from special hospitals which provide treatment in a particular specialty (for example, maternity, paediatrics, etc.). Voluntary, regional and county hospitals differ in terms of governance and management structure and the level at which services may be provided. These hospitals may also differ in terms of their teaching status.

In both years, voluntary and special hospitals consistently had a higher than expected mean length of stay given the composition of their discharges. For voluntary hospitals, the mean length of stay was 8 per cent and 10 per cent higher than the expectation (based on the national average) in 2000 and 2006 respectively. A potential confounding factor may be that this group contains five of the eight teaching hospitals in Ireland (as classified for the purposes of the National Casemix Programme). Teaching hospitals have been shown to have longer lengths of stay, partly perhaps related to their role in providing training and medical education, and undertaking research activities (Yuan *et al.,* 2000). Special hospitals also had a longer length of stay than expected on average (2 per cent and 1 per cent above unity in 2000 and 2006 respectively). Conversely, the mean standardised length of stay was consistently lower in regional and county hospitals in both years.

Figure 2.8: Mean Standardised Length of Stay by Hospital Type, 2000

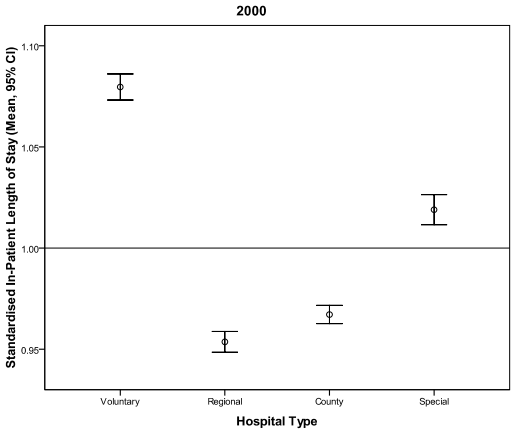
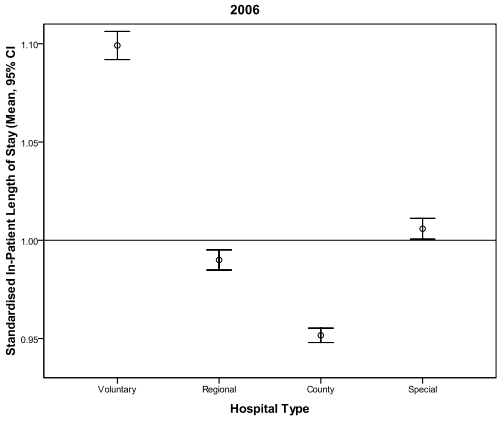


Figure 2.9: Mean Standardised Length of Stay by Hospital Type, 2006



Notes: CI, confidence interval.
In 2001, one hospital changed its status from a voluntary to a county hospital. For the purposes of this analysis, this hospital was categorised as a voluntary hospital in 2000 and a county hospital in 2006.

The analysis presented here shows that 'hospital type' has a bearing on patient length of stay. While voluntary and special hospitals are shown to have a mean standardised length of stay that is higher than expected, the standardised mean length of stay for regional and county hospitals is lower than expected. In pursuing the objective of reducing average length of stay, this analysis suggests that performance improvements may need to be tailored to the specific characteristics of, and circumstances facing, individual hospitals. The considerable deviation across individual hospitals in both crude and standardised length of stay warrants further investigation.

2.6 Conclusions

While future population growth will undoubtedly impact on the demand for health services, perhaps more important from the perspective of acute hospital services is that the population is ageing. By 2021, those aged 65 years and over are projected to increase their share of the overall population from 11 to 15 per cent, while the population aged 85 years and older will more than double (Morgenroth, 2008).

The PA Consulting Group (2007a) report was commissioned by the HSE to estimate acute hospital bed capacity requirements for Ireland for 2020. When estimated on the basis of current utilisation patterns, this study estimated that 19,822 public patient hospital beds will be required by 2020 while the projections based on the Preferred Health System model estimate that just 8,834 public patient beds will be required by 2020. Over three-quarters of the savings in public patient bed numbers between the two models have been attributed to the proposed reduction in in-patient length of stay and increasing day case activity. Given the crucial role proposed for these two factors in facilitating the achievement of reductions in acute hospital bed capacity in the context of the PHS, this chapter has been concerned with identifying those issues which may be critical to the achievement of these objectives.

In assessing the potential for increasing day case activity towards the levels proposed in the PA Consulting Group (2007a) report, the analysis presented here examined variations in day case activity relative to available capacity at the hospital level and at the level of specific procedures. The variation in day case rates across hospitals with similar proportions of day beds would suggest that the achievement of national objectives in relation to day case rates may need a more targeted intervention where the rates for individual hospitals are lower than would be expected given the capacity available.

The day case rates for the individual procedures in the internationally-recognised Basket 24 (adapted for Ireland) were reviewed and shown to vary across the hospitals in which they were performed. The number of additional day cases that could potentially be achieved in 2006 if each hospital was performing at the upper quartile level was calculated for each of the Basket 24 procedures. If all hospitals in 2006 were performing this set of day case procedures at the upper quartile day case rate for each Basket 24 procedure, the number of day cases, in place of elective in-patient cases, would have been 15.2 per cent (8,926 cases) greater than that actually achieved in 2006. The savings varied between procedures with 'cataracts' procedures allowing for the greatest scope in the reduction of elective in-patient cases and consequently beds days.

The evidence presented here supports the assumption that there is potential to increase day case activity as part of the PHS model. The variation observed between hospitals and across procedures would suggest, however, that the achievement of the proposed targets may necessitate customisation of this policy for individual hospitals and for specific procedures.

The potential to reduce in-patient average length of stay was assessed from the perspective of demand and supply. On the demand side, the top 10 per cent of inpatient discharges used almost 50 per cent of in-patient bed days. These discharges, the so called high users, were older and sicker than other users. The high users were being treated for more complex

conditions which were often associated with chronic conditions. While treatment in other care settings may be equally or more appropriate for many in this group, this analysis would suggest that an attempt to reduce bed day utilisation within the acute public hospital sector will have to ensure that an appropriate response to the needs of this potentially vulnerable group are specifically addressed.

When variations in average length of stay for specific procedures were assessed, it became evident that many hospitals were achieving, or surpassing, the 2020 targets in 2006. There was, however, substantial variation by procedure and by hospital suggesting that optimisation of progress towards the achievement of the 2020 targets at the hospital system level may benefit from a performance management approach focussed on specific procedures and individual hospitals.

On the supply side, there is considerable variation in average length of stay across hospitals and hospital groups. Controlling for discharge characteristics, the mean standardised length of stay for voluntary and special hospitals was higher than expected while that for regional and community hospitals was lower than expected.

While there are undoubtedly benefits to an integrated model of health care provision as proposed by the HSE, reducing the over-reliance on hospitals inherent in the Irish health care system will be a challenge not only for the acute public hospital sector but for the health care system as a whole. The variation observed in the volume and mix of day case rates in the analysis presented here indicates very clearly that any national policy aimed at increasing day service rates will have to be specifically targeted at the individual hospital level. Targeting specific procedures may also be required. With regard to average length of stay, the variation in length of stay observed by hospital type, together with the fact that many of the so called 'high users' are elderly, medical card holders suffering from multiple morbidity/chronic conditions is indicative of the complexity faced in attempting to address this issue.

The implementation of the policy of community-based, integrated care will also be important for any initiative aimed at moderating future demand for hospital services. Given projected population growth, together with the ageing of the population, ongoing study is required to ensure that there is adequate provision of the required services in the community and the acute hospital sector to meet potentially increasing demand over the coming decades.

APPENDIX 2.1: BASKET OF PROCEDURES

To get a clearer picture of day case activity, it is common practice to use a list of selected surgical procedures which are frequently performed as in-patient procedures but which are increasingly practised in a day setting (De Lathouwer and Poullier 1998; De Lathouwer and Poullier 2000; Wasowicz *et al.* 2000; Healthcare Commission 2005; Auditor General for Wales 2006). The list of procedures used varies from study to study but there are a number of procedures which are common to many studies, these include cataract surgery, varicose vein ligation and stripping, hernia repair and myringotomy amongst others.

According to the Audit Commission (2001), it was usual for the day case rate to be reported as an aggregate either across NHS Trusts or for a particular specialty. It was felt that this aggregation did not take into account the differences in the nature and complexity of the cases treated. In 1990, the Audit Commission, in association with the Royal College of Surgeons, developed a basket of 20 surgical procedures to provide a more consistent measure of performance. The procedures included in the original basket of procedures (Audit Commission, 2001, p 3):

- are commonly performed, so account for a large volume of surgery;
- are suitable for treatment as day cases; and
- would not generally be performed for an outpatient, thus focusing attention on the potential to treat more in-patients as day cases.

The original list of 20 procedures was revised in association with the British Association of Day Surgery in 2000. Some procedures were amended or excluded and, given technological advancements over the period, additional procedures were added. The new Audit Commission 'Basket 2000' contains 25 procedures. The list of procedures was chosen to include representative procedures from each of the main surgical specialties (general surgery, urology, orthopaedics, ophthalmology, ear, nose and throat, and gynaecology). As one procedure, 'termination of pregnancy', is not applicable in the Irish case the group of procedures will be referred to as the 'Basket 24' procedures.

Based on the method outlined by the Audit Commission, a procedure is included in the Basket 24 where:

- the definition code appears as a principal procedure; or
- the definition code appears as a secondary procedure and the principal procedure is one of the acceptable principal procedures; and
- there are no exclusion codes present as either a principal or secondary procedure.[28]

The Audit Commission Basket 25 procedures were originally specified using expert advice from clinicians and from what is now the NHS Classifications Service. The procedure codes were specified from the OPCS Classification of Interventions and Procedures (OPCS-4), which is the clinical coding scheme used by the NHS in the UK. For the analysis contained in this report, ICD-9-CM and ICD-10-AM codes were identified by the Clinical Coding Support Team in the Health Research and Information Division in the ESRI to be the closest match to those used by the Audit Commission. The codes used here are available from the authors on request.

[28]To avoid the potential double counting where a definition code is found in both principal and secondary positions, the discharge is allocated to the procedure identified as the principal procedure.

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3. General Practitioner Care

Stephen Thomas, Richard Layte

3.1 Introduction

Primary care is often the first point of contact with the health care system for people requiring care. Primary care is often thought synonymous with general practitioners, but actually encompasses a large range of different professionals and services including nurses/midwives; physiotherapists; occupational therapists; dentists; opticians; chiropodists; psychologists and pharmacists. The list is not exhaustive, but still gives an indication of the wide range of services that can be grouped under the general heading of primary care. Nonetheless, GPs do have a core part to play in primary care as well as performing the role of 'gate keeper' to other health services such as accident and emergency or outpatient care in hospitals. The balance of treatment and referral between general practice and secondary care is, therefore, a very important issue and it has been argued that the under development of primary care services in Ireland in recent decades has contributed, and indeed, may be the most important reason, for the over-crowding of accident and emergency services and long waiting lists for elective procedures in Irish health care (Layte *et al.*, 2007b; Tussing and Wren, 2006).

This chapter has three main objectives. In the first part of the chapter we examine the current structure of primary care and possible future developments as these have major implications for the development of primary care to 2021. The first section also examines the impact of policies that control the pricing of primary care in Ireland on the take-up of GP care. Ireland is fairly unique in Europe in its mix of private and public financing and this has a considerable impact on the pattern of utilisation found at present. In the second part of the chapter we bring together the demographic projections outlined in the first chapter of this report with current utilisation patterns to project the absolute number and distribution of GP consultations across age and sex groups to 2021 for the state as a whole and within HSE regions. Ideally, this chapter would project demand for and delivery of other forms of primary care such as dentistry, chiropody etc., but this would mean less detail on trends in the core element of primary care which is general practitioners. Given this we choose in this chapter to focus exclusively on GP care. In the third and final part of the chapter we examine the current supply of GPs in Ireland and how this is likely to change in the period to 2021. This is then contrasted with the increases in population that are projected to occur over the same period.

3.2 The Policy Context: The Primary Care Strategy

The needs and demands of the population may well be a significant determinant of change in the provision of primary care in Ireland over the next decade or so, but present government policy may also have a profound impact if implemented. The Primary Care Strategy, *Primary Care: A New Direction* makes it clear that the current system of primary care in Ireland is inadequate. Primary care has the potential to supply 90 to 95 per cent of all health and personal social care services (Department of Health and Children, 2001), yet at present primary care falls significantly short of this target because the current system has a number of structural problems. First and foremost, primary care infrastructure has developed in a fragmented and unsystematic fashion so services are delivered by different disciplines and agencies in an uncoordinated fashion.

O'Dowd *et al.* (O'Dowd, O'Kelly and O'Kelly, 2006) found that although only 35 per cent of GPs now work in single-handed GP practices, over 60 per cent work either alone or with just another GP. Less than 20 per cent of GPs work with more than four GP colleagues in the same practice. Users often find it difficult to access GP services out of office hours and this means that they are more likely to attend already busy accident and emergency departments.

Use of information technology has increased over the last decade and a half from 27 per cent of practices to 89 per cent in 2005 (O'Dowd *et al.,* 2006), but there is no centralised and harmonised record system and it is still rare for GP practice computer systems to be connected to hospital databases, although this is now beginning to occur.

Although over 70 per cent of practices now employ a nurse either full-time or part-time, it is still rare for GPs to work alongside other health professionals to provide an integrated primary care system.

The Primary care strategy proposes that primary care be delivered through 'primary care teams' which are to include:

- GPs
- Nurse/midwives
- Health care assistants
- Home helps
- Physiotherapists
- Occupational therapists
- Social Workers
- Receptionists
- Clerical officers
- Administrators

These inter-disciplinary teams will come together, preferably in a single location, to serve a population of 3,000 to 7,000 people and will be integrated into a wider 'primary care network' made up of chiropodists, pharmacists, dieticians, psychologists and other health professionals. These integrated care teams will have access to effective information and communications technology which will provide a single patient record that

can be accessed in a controlled fashion by eligible health professionals across the care system.

Although the strategy envisages 600 to 1,000 primary care teams nationally under the life of the current health strategy, in fact development has been very slow and only a fraction of that number have come into existence. Ten teams were established in the Eastern part of Ireland during an initial pilot phase and these have been joined by another 87 teams as of April 2008. However, few of these teams actually practice from the same premises and given constraints in the availability of health professionals and infrastructure across the country it is likely that many are actually aspirational rather than a reality. If this rate of development continues then the degree of change in the delivery of primary care by 2021 will be modest and the present fragmented system will largely remain. If, however, the proposed system were to be developed it would have a major impact on the delivery of care. Bringing services together within a 'network of care' could theoretically increase the demand for care across the population because access would be improved. As we will go on to discuss however, the impact of greater access to a range of medical services in these structures may be negated by the pricing of services for those without a medical card.

The greater efficiency and coordination provided by care teams and better information technology could also significantly improve the health and well-being of the population. This may reduce the demand for primary health care over the long term. A reformed primary care would also have profound implications for the hospital sector. Improved health promotion and a better integration of health professionals may improve health overall and reduce the need for secondary care by treating illness before it becomes serious enough to warrant hospital care. The availability of sophisticated diagnostic services in primary care would mean that patients do not need to attend hospitals for these services.

3.3 The Influence of Pricing Structure on the Use of Primary Care

Another factor that impacts on the present utilisation patterns of primary health care is the pricing structure. GP, dental, optician and aural services are only free for the 30 per cent of the population who qualify for a medical card under an income means test (known as medical card patients). While the majority of those who are granted a medical card qualify on the basis of an income means test, individuals may also qualify on the basis of age, particular health needs and participation in approved Government training and employment schemes. After July 1 2001 all over 70s in Ireland were eligible for a medical card regardless of income although an income means test was subsequently implemented in 2009. This made those over 70s with a weekly income over €700 ineligible for a medical card.

The income thresholds for a medical card are set nationally and updated annually by the Health Service Executive (HSE). Currently (as at January 2009), the (gross) weekly income thresholds are €184.00 for a single person under 66 years living alone, €266.50 for a married couple and €342.50 for a married couple with two children. The thresholds are higher for individuals aged between 66 years and 69 years, and there are additional allowances available for rent/mortgage, childcare and commuting costs (see www.medicalcard.ie/guide/). A GP consultation fee of €40-45 (without adding any associated prescription costs), which would not be unusual

(although there are no national figures on visiting costs at present), would constitute 20-22.5 per cent of the weekly disposable income of a single individual earning €200 per week (i.e., above the threshold for a medical card). To put the thresholds in context, the average gross weekly industrial wage in Ireland in 2006 was about €600 (CSO, 2006). Since 2005, individuals whose means are above the standard medical card threshold can avail of a doctor only medical card which gives free access to GPs, but does not cover prescriptions. The means test for this card is 50 per cent higher than for the standard medical card.

The remaining 70 per cent are entitled to public hospital services at a nominal charge (€60 per night up to an annual maximum of €600) and prescription medicines over a monthly limit, but must pay in full for GP services, although they are eligible for subsidised dental and optical treatment under the Treatment Benefit Scheme administered by the Department of Social and Family Affairs (provided they have the necessary PRSI (social insurance) contributions). Private patients are also entitled to tax relief on certain medical expenses at their marginal rate of tax (they must however pay the first €125 per annum) and in addition, the three main private insurers (VHI, BUPA (now Quinn Health Care) and VIVAS) have recently introduced new plans that provide limited cover for primary care expenses. Providers are free to set the level of charges levied on private patients. However, the majority of private patients pay the full cost of their GP services (as they do not visit frequently enough to avail of tax relief and/or partial reimbursement under private health insurance), while the majority of those visiting their dentist or optician will receive some assistance from the state, although not to the same extent as that afforded to medical card patients. Table 3.1 sets out the current entitlements to free or subsidised GP, dentist and optician services for medical card and private patients in Ireland.

While the income thresholds for a medical card increase annually in line with inflation, rising employment and average incomes in recent years have meant that the proportion of the population eligible for a medical card fell steadily, from 35.8 per cent of the population in 1993 to 28.1 per cent in 2005 (General Medical Services Payments Board, various issues). Coverage subsequently increased to 29.4 per cent in July 2007. It is in this context that recent discussion has focused on the affordability of GP services, and in particular the situation of those just above the income threshold for a medical card.

In part in response to such concerns, a GP visit card was introduced in October 2005, with income guidelines initially 25 per cent higher, and now 50 per cent higher, than for the standard medical card, but which only covers the cost of a GP visit, and not the associated prescription costs, or other ancillary services, such as physiotherapy or dentistry. GP visit cardholders must also pay public overnight charges and Accident and Emergency charges in hospital which are not levied on medical card holders. Currently, the income thresholds for a GP visit card are €276.00 per week for a single individual aged up to 65 years, €400 for a married couple with no dependents and €557 for a married couple with two children under 16 years. Again, the thresholds are higher for those aged over 66 years, and the same allowances as for the standard medical card are available (see www.medicalcard.ie/guide/). By July 2007 about 70,500 GP visit cards had been issued (compared with the figure of 200,000

mentioned when the scheme was being introduced). Unlike those covered by the standard medical card, those who hold a GP visit card have to pay not only charges for hospital care, but at primary level also have to pay the cost of prescribed medicines (up to a monthly ceiling of €100).

Table 3.1: Eligibility for Free Primary Care Health Services in Ireland

	GP Services	Dentist Services	Optician Services
Medical Card Patients	Free	Free	Free
Private Patients	Full cost, but may also be eligible for:	Full cost, but may also be eligible for:	Full cost, but may also be eligible for:
	(1) Tax relief on medical expenses over €125 per annum	(1) Tax relief on medical expenses over €125 per annum	(1) Tax relief on medical expenses over €125 per annum
	(2) partial reimbursement if privately insured and GP fees exceed a large annual deductible*	(2) partial reimbursement of cost if privately insured and dental fees exceed a large annual deductible*	(2) partial reimbursement of cost if privately insured and optician fees exceed a large annual deductible*
	(3) partial reimbursement if privately insured under a dedicated primary care health insurance plans**	(3) partial reimbursement if privately insured under a dedicated primary care health insurance plan	(3) partial reimbursement if privately insured under a dedicated primary care health insurance plan
		(4) free or subsidised routine dental treatment under the Treatment Benefit Scheme	(4) free or subsidised routine optician services (e.g. eye examination, glasses) under the Treatment Benefit Scheme

*For example, under the Essential BUPA plan, GP expenses in excess of €250 per annum are reimbursed at €20 per subsequent visit.
** For example, under the Health Manager BUPA plan, half the cost of GP expenses are reimbursed, up to a maximum of €7,650 per annum

In part in response to such concerns, a GP visit card was introduced in October 2005, with income guidelines initially 25 per cent higher, and now 50 per cent higher, than for the standard medical card, but which only covers the cost of a GP visit, and not the associated prescription costs, or other ancillary services, such as physiotherapy or dentistry. GP visit cardholders must also pay public overnight charges and Accident and Emergency charges in hospital which are not levied on medical card holders. Currently, the income thresholds for a GP visit card are €276.00 per week for a single individual aged up to 65 years, €400 for a married couple with no dependents and €557 for a married couple with two children under 16 years. Again, the thresholds are higher for those aged

over 66 years, and the same allowances as for the standard medical card are available (see www.medicalcard.ie/guide/). By July 2007 about 70,500 GP visit cards had been issued (compared with the figure of 200,000 mentioned when the scheme was being introduced). Unlike those covered by the standard medical card, those who hold a GP visit card have to pay not only charges for hospital care, but at primary level also have to pay the cost of prescribed medicines (up to a monthly ceiling of €100).

This mix of universal provision for specific groups and a fee-based system for the majority may well contribute to the quite unique pattern of GP utilisation found across the income distribution in the Republic of Ireland compared to other European countries. Research (Layte and Nolan, 2004) has shown that lower income groups in Ireland are far more likely than those higher up the income range to use GP services. This is similar to other European countries and is the result of the greater need for health care among those with lower income. However, in Ireland the difference in the frequency of GP visiting between the lowest income groups (i.e. those who qualify for a medical card) and all others is far larger than in other countries (Nolan and Nolan, 2004). Even controlling for the fact that those lower down the income distribution are more likely to be older, analyses show that there is a large difference between the GP utilisation patterns of those with and without a medical card. The higher utilisation of those with a medical card may reflect the absence of financial disincentives but may also reflect the fact that these groups are less likely to have medical insurance and thus tend to wait longer for secondary care. Frequent GP visits may, therefore, be required to maintain chronic health conditions in the absence of more specialist interventions.

However, the pricing structure of primary care in Ireland does not influence all forms of care in the same way. Layte and Nolan (2004) found that dental services are far more likely to be used by those with higher levels of income and the lowest visit rate is among those in the medical card group, even though the same basic structure of charges applies.[1] This suggests that other factors may be important other than income alone. It may be for instance that higher income groups put a greater value on dental health, perhaps as a result of their higher levels of education. This could have significant implications for the future provision of dental services as levels of education are increasing substantially year on year.

The impact of pricing on the use of health care may limit the gains achieved through a reform of the primary care system. It is not possible to say whether medical card recipients 'over use' GP services or whether non-medical card patients 'under-utilise' services, but it is reasonably clear that the structure of pricing does artificially increase visiting among one group and lower for the other. This suggests that the reform of the pricing structure of care in the future may have a significant impact on the patterns of utilisation.

[1] The number of HSE dentists has been falling over time and this may mean that access to dental services for medical card patients may be more problematic than access to GPs.

3.4 Data and Methodology

Projections of the impact of demographic change on GP utilisation to 2021 not only require a through analysis of the changing population patterns that are likely to occur in the intervening period, they must also take changing trends in GP utilisation into account. Analysis of these trends is made somewhat difficult by the relative lack of evidence on GP use available upon which to measure trends. The Living in Ireland Panel Survey (LII) carried out by the ESRI included measures of GP use from 1995 to 2001. In 2003 the European Union Survey of Income and Living Conditions (EU-SILC) began but this only measured GP visits among those with a medical card, around one-third of the population. This makes it impossible to examine trends in GP utilisation across the entire population over the last five years. The absence of information on health care use among those aged under 16 years in LII also means that there is no available information on trends in children's use of health care for any period. This means that all analyses in this chapter refer to the population aged 16+ years.

Using the LII data we will first examine the current distribution of GP visits across age and sex groups. Demographic projections by age and sex by year will then be used to project future GP utilisation at both a national and sub-national level (county and HSE area). We discuss below whether trends in GP utilisation over the recent past should be factored into future use projections. Epidemiological projections are integrated by inflating the future utilisation projections to take account of changes in morbidity across a number of conditions as described in the opening chapter of this report.

3.5 Current Patterns and Past Trends in GP Utilisation

Descriptive analysis of the LII survey using data from 1995 to 2001 shows that the overall rate of GP visiting did not change over the period with the average person having 3.5 visits in 1994 and 3.3 visits in 2001. However, a more sophisticated multivariate analysis using 'count' models of GP use controlling for the age distribution of the population does show an increase in the frequency of consultation. This difference in findings stems from the fact that the proportion of the population having one or more visits in the previous year did increase between 1995 and 2001 from just over 70 per cent to 74 per cent. This increase is an important development as it could suggest that any projection of GP use into the future should factor in an overall increase in utilisation. However, before doing this it is necessary to identify the source of the increase and the extent to which this source will continue into the future or represents a specific 'period effect' that will not continue.

Further analysis of the LII data shows that the trend can be explained by the addition of variables representing the extent of chronic illness in the population and the individual's level of income. The period from 1995 to 2001 covers the years when the Irish economy was growing very quickly with annual increases in national income in double figures and it seems likely that this increase in affluence led to an increase in the propensity to visit the GP, even though the average health status of the population remained roughly the same. Although average health status did not change, analysis shows that there were counter-veiling developments across age groups. At the same time as there was an increase in the proportion of younger respondents with a chronic illness, the proportion of older respondents reporting an illness actually fell (see Layte, Nolan and Nolan,

2007a). Thus, only once we control for the distribution of health and income do we account for the trend in GP utilisation.

If change in levels of income 1995 to 2001 largely account for the changing propensity to visit the GP it is arguable that this trend should not be included in the projection since income trends could be very different in the period from 2006 to 2021, the projection horizon. It certainly seems likely that the intense income growth, both nationally and at the household level that was experienced between 1995 and 2001 will not return in the near future. Given this the projection models used in this section do not include a factor for growth in utilisation.

PROJECTING GP UTILISATION ON CURRENT UTILISATION PATTERNS

Table 3.2 shows the average number of GP visits per year by age and sex measured over the period from 1995 to 2001 in the Living in Ireland Panel Survey.

Table 3.2: Average Number of GP Visits Per Year 1995 to 2001

Age Group	Men	Women
16-20 years	1.4	2.2
21-30 years	1.6	3.3
31-40 years	2.1	4.0
41-50 years	2.4	3.5
51-60 years	3.1	4.0
61-70 years	4.8	5.1
71-80 years	5.9	6.9
81+ years	7.2	7.8

Source: Authors calculations, Living In Ireland Panel Survey 1995-2001.

Table 3.2 shows that the average number of GP visits among women is higher than among men in each age group, a pattern which has been repeatedly observed across a number of countries and contexts. The table also shows a steep increase by age, particularly for men. Men in the oldest age group, those aged 81+ years, have almost six times the number of GP consultations as men in the youngest age group. The increase is not so steep among women, but even here, the oldest age group have almost twice the number of visits as the youngest age group. The first chapter of this report showed that all counties in the Irish Republic will experience significant population growth over the period to 2021 and this overall increase is shown in Table 3.3.

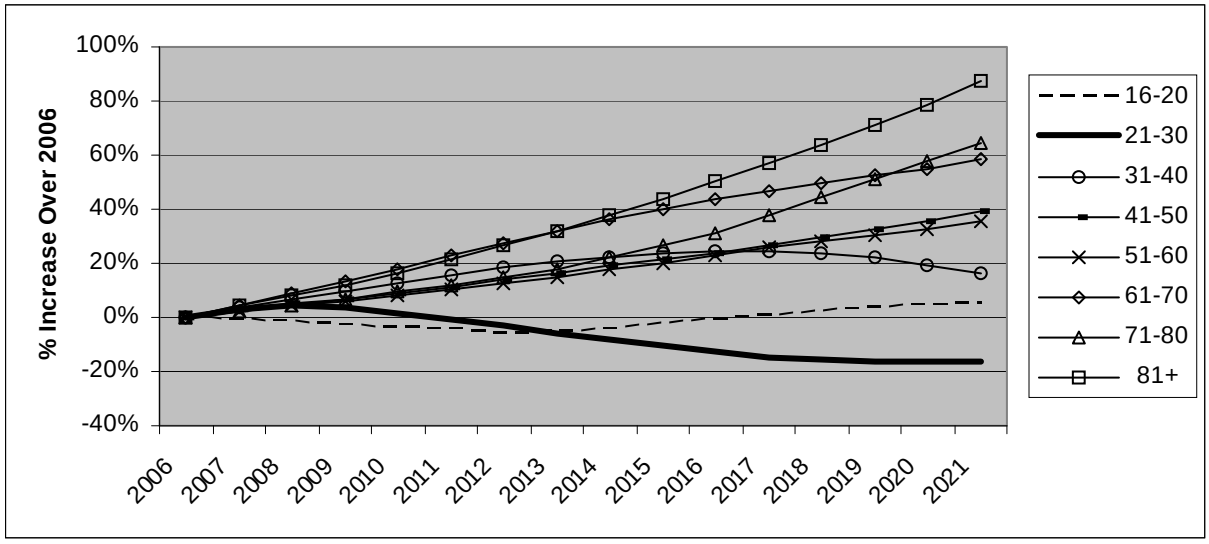
Table 3.3: Projected Increase in Overall Population Aged 16+ Years by Sex 2006-2021

	2006	2010	2015	2021
Men	1,648,015	1,789,636	1,919,833	2,067,239
% Change on 2006	-	8.6%	16.5%	25.4%
Women	1,669,066	1,791,833	1,904,644	2,035,159
% Change on 2006	-	7.4%	14.1%	21.9%
Total	3,317,081	3,581,469	3,824,477	4,102,397
% Change on 2006	-	8.0%	15.3%	23.7%

The proportion of men is expected to rise by 25 per cent, women by 22 per cent and the overall population by 24 per cent over the projection period. But, apart from a substantially increasing population, the primary demographic change to occur is an increase in the number and proportion of older people in Irish society with a concomitant decrease in the younger age groups. The implication is that the very age groups who are the heaviest users of health care will be exactly the age groups that increase substantially in size.

This is shown well in Figure 3.1 which shows the proportionate population change by age group using the same age ranges as used in Table 3.2. This shows a proportionate decline in those aged 21 to 30 years (after a peak in 2009) with the number in this age group reaching 83 per cent of its 2006 size by 2021. Among the youngest age group (16 to 20) the number initially falls to a 94 per cent of its 2006 level by 2012 before recovering to 105 per cent of this level by 2021, largely as a result of the increase in the number of births over recent years. Above age forty all age groups increase significantly in size between 2006 and 2021 with the oldest age groups increasing the most. Among those aged 61 to 70 we see a 58 per cent increase, among those aged 71 to 80 a 65 per cent increase and among the oldest age group (81+), an 87 per cent increase.

Figure 3.1: Proportionate Change in Size of Population Age Groups 2006-2021



3.6 The Impact of Population Change on Overall GP Consultations

By combining Table 3.2 and the projected population numbers 2007-2021 we can assess the impact of demographic change on GP utilisation patterns on the basis of current utilisation.[2] As the average number of visits to GPs does not change over time (see above), the proportionate increase in number of visits to GPs per year for each age group is essentially the same as the proportionate population change (except for minor changes in the balance between the sexes). However, as the older age groups are heavier users of GP services the change in population composition will

[2] The introduction of the over 70s medical card in July 2001 may have increased the propensity to visit the GP among this age group although analyses by Layte *et al.* (2009b) did not detect an independent effect for the change in eligibility.

influence both the total number of consultations and the age composition of these consultations. Based on the 2001 consultation rates by age and sex groups in Table 3.2, there were 11.2 million consultations for the population aged 16 years or more in 2006. Table 3.4 shows how this total number of consultations is projected to increase between 2006 and 2021.

Table 3.4: Projected Increase in GP Consultations Aged 16+ Years 2006-2021

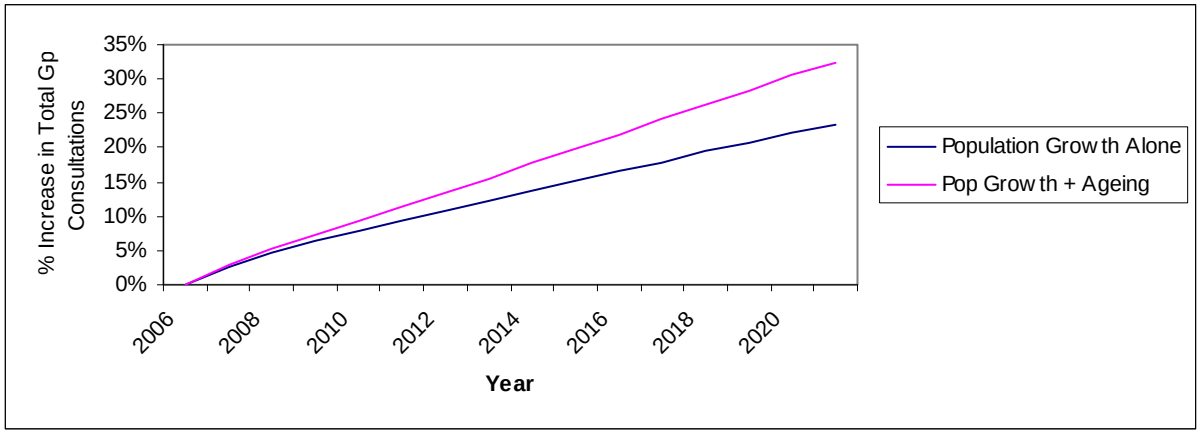
	2006	2010	2015	2021
Men	4,393,483	4,871,608	5,433,740	6,139,622
% Change on 2006	-	10.9%	23.7%	39.7%
Women	6,752,777	7,325,845	7,919,734	8,632,071
% Change on 2006	-	8.5%	17.3%	27.8%
Total	11,146,260	12,197,453	13,353,474	14,771,693
% Change on 2006	-	9.4%	19.8%	32.5%

With the overall increase in population we project the 2006 figure to increase to 12.2 million by 2010, 13.4 million by 2015 and 14.8 million by 2021. This represents a 20 per cent increase by 2015 and a 33 per cent increase by 2021. Table 3.4 also shows a very pronounced difference in the rate of growth in consultations between men and women over the projection horizon with the former increasing by 40 per cent compared to 28 per cent among the latter. This stems from the larger increase in the numbers of men over the period[3] and the steeper increase in consultation rates among men with age as shown in Table 3.2.

It is useful to try to separate the impact that the ageing of the population over the period from 2006 to 2021 is having on the growth in consultations compared to the overall growth in population size. Even without the average age increasing, the increasing size of the population would still lead to an increase in consultations even if the age composition of the population remained unchanged. We can perform this thought experiment by simply summing the overall population growth by the average number of consultations in the population for men and women (rather than summing by the average in each age and sex group). Doing so will essentially yield the figure for population growth over the projection period, that is, an increase of 25 per cent among men and 22 per cent among women, with an overall growth rate of 23 per cent. This shows that the projected ageing of the population will produce a 14 per cent increase in the number of consultations among men and 6 per cent among women (9 per cent overall) on top of the 25 and 22 per cent increases that would be expected with the overall growth in population size as shown in Figure 3.2.

[3] The number of men in the population is projected to increase by 25.4 per cent compared to 21.9 per cent among women. This will lead to the proportion of men in the population increasing from 49.7 per cent to 50.4 per cent.

Figure 3.2: The Impact of Population Ageing on Total GP Consultations



3.7 The Changing Distribution of GP Consultations Across the Population

The pronounced gradient in number of GP consultations a year across age groups and the higher level of increase in the number of older people in the population will lead to a redistribution of the pattern of consultations across the age groups as shown in Table 3.5. Among the three youngest age groups we see decreases in the proportion of total consultations whereas the proportion increases among older age groups. The drop in proportion is particularly pronounced among those aged 21 to 30 years where the proportion is projected to fall from 16 per cent to 10 per cent over the projection period. The proportion of consultations projected for those aged 31 to 40 years actually increases initially from 17.8 to 18.3 per cent before falling precipitously to 15.5 per cent.

Table 3.5: The Projected Distribution of GP Consultations Across Age Groups 2006-2021

Age Group	2006	2010	2015	2021
	%	%	%	%
16-20 years	4.6	4.1	3.8	3.7
21-30 years	15.9	14.7	11.8	9.9
31-40 years	17.8	18.3	18.3	15.5
41-50 years	14.9	14.8	15.1	15.6
51-60 years	14.7	14.5	14.7	15.0
61-70 years	13.8	14.9	16.1	16.5
71-80 years	11.7	11.7	12.3	14.5
81+ years	6.6	7.1	7.9	9.3
Total	100	100	100	100

The proportion of consultations which those aged 71 years or more constitute is projected to increase from 18.3 per cent to 23.8 per cent, an increase of 5.5 per cent.

3.8 County Level Change in GP Consultations

As set out in the first chapter of this report, all counties except Dublin are projected to experience an increase in total population between 2006 and 2021. The rates of growth vary significantly across counties with Meath, Laois, Cavan and Wexford projected to have particularly strong rates of growth whereas Limerick, Sligo and Kerry sit at the other end of the table with lower, albeit positive growth rates. These differences clearly have implications for the projection of the volume of GP consultations. It is important to remember that we do not have disaggregated figures on

consultation rates for each county so differences in growth rates in total numbers of consultations in each county are driven solely by the changing composition of county populations between 2006 and 2021. Table 3.6 shows the overall growth in consultations projected to occur between 2006 and 2021 disaggregated by county. As we would expect, the patterning of the counties largely reflects the population growth discussed in the first chapter with Meath and Laois experiencing the largest projected growth in consultations at 73 and 58 per cent respectively. In the earlier analysis of county change in population size, the next highest growth rates were in Cavan and Wexford, but in Figure 3.5 County Kildare now emerges as experiencing the third highest growth rate in consultations. The change in the position of Kildare relative to other counties can be explained by the very large increase in the size of the older cohorts in Kildare that are projected to occur by 2021. The national projection for those aged 71to 80 years and 81+ is for increases of 65 per cent and 87 per cent respectively, in Kildare these figures are 151 per cent and 93 per cent. The relatively lower total population growth projected for Kildare stems from the small increases in younger age groups. For example, those aged 21-30 years in Kildare are projected to increase by just 0.3 per cent during the projection period.

Table 3.6: Projected Percentage Increase in GP Consultations Over 2006 to 2021 by County – Ranked by Growth in 2021

	2007	2010	2015	2021
Meath	5.2	19.0	42.4	73.3
Laois	3.5	13.9	32.8	58.3
Kildare	4.0	13.7	30.3	52.6
Cavan	3.7	12.9	29.1	50.3
Wexford	3.7	13.4	29.7	50.0
Offaly	3.6	12.3	26.9	45.3
Leitrim	3.7	12.4	26.3	44.1
Wicklow	3.2	11.1	24.5	41.9
Kilkenny	3.0	10.9	24.4	41.6
Longford	3.3	10.9	24.1	40.4
Louth	2.9	10.2	22.6	39.2
Westmeath	3.3	10.9	23.2	39.0
Roscommon	2.9	9.9	22.0	37.6
Galway	3.5	11.1	22.6	36.8
Carlow	3.0	10.0	21.3	35.6
Clare	2.4	8.6	19.4	33.6
Donegal	2.7	9.0	19.5	32.7
Cork	2.7	9.0	19.0	31.2
Tipperary N.	2.4	7.9	17.8	30.0
Monaghan	2.7	8.8	18.4	30.0
Tipperary S.	2.0	7.4	16.6	28.3
Waterford	2.3	7.8	16.3	27.0
Limerick	2.4	7.8	16.1	26.1
Mayo	2.2	7.2	15.5	25.9
Kerry	2.2	7.3	15.6	25.4
Sligo	1.9	6.9	14.5	23.9
Dublin	2.5	7.2	13.3	19.6

At the other end of the spectrum, Dublin, Sligo and Kerry are projected to experience the lowest increases in total consultations by 2021, but even here, the projection is for their levels to increase by 19.6, 23.9 and 25.4 per cent respectively. The lower level of total consultations in these counties stems partly from lower levels of increase among the older age groups (although even here rates of increase are between 50 and 100 per cent), but mostly because of lower levels of increase among younger age groups.

3.9 Change in GP Consultations by HSE Region

As well as looking at the patterns for all counties it is also useful to group the patterns of population change into the HSE regions under which health care is organised.

Table 3.7: Population Change Over 2006 to 2021 by HSE Region

	2007	2010	2015	2021
Dublin North-East	3.1	9.3	17.9	28.1
Dublin Mid-Leinster	2.5	6.8	12.4	18.8
Southern	2.6	8.1	16.0	25.1
Western	2.7	8.0	15.6	24.0

Table 3.7 shows that the populations of the four HSE regions are all projected to increase substantially between 2006 and 2021 but as we would expect from the first chapter, the rate of increase varies substantially. Dublin Mid-Leinster is predicted to experience the lowest rate of population growth over the period at 19 per cent followed by the Western region (24 per cent) and Southern (25 per cent). Interestingly, Dublin North-East is predicted to experience the highest rate of population growth at 28 per cent even though Dublin itself will be experiencing the lowest rate of growth of any county. The reason for this high level of growth can be found in the changes predicted to occur in Meath and Cavan over the same period.

Table 3.8: Percentage Change in Number of GP Consultations Over 2006 to 2021 by HSE Region

	2007	2010	2015	2021
Dublin North-East	3.3	11.0	23.1	37.9
Dublin Mid-Leinster	2.8	8.7	17.7	28.6
Southern	2.7	9.2	19.9	33.1
Western	2.7	8.9	19.0	31.6

When we turn to the impact that population growth and ageing will have on GP consultations across HSE regions in Table 3.8 we see that it is substantial, although the same ordering of HSE regions persists with Dublin North-East experiencing the highest increase at 38 per cent followed by the Western region at 32 per cent, Southern at 33 per cent and Dublin Mid-Leinster at 29 per cent.

3.10 The Impact of Changing Morbidity and Demand on GP Consultations

The projections of GP consultation growth presented so far in this section have been based solely on the changing composition of the population between 2006 and 2021. It is possible, however, that the changing health of the population will also impact on utilisation of GP services. Such 'epidemiological projections' are extremely problematic as they require the selection of current indicators which are predictive of health care utilisation and then establishing the processes that may impact on these indicators over the projection horizon. Our solution to this problem was to adopt the methodology (described in more detail in the first chapter) of a recent PA Consulting Group report (PA Consulting Group, 2007a; PA Consulting Group, 2007b) which combined projections from two main sources on three different indicators of morbidity (essentially the incidence figures of three groups of diseases). This method produces a projection of morbidity change that is expressed as a

proportionate change in the incidence of the conditions included, but which could also be used as a general indicator of improvement or disimprovement in overall morbidity. This method involves two very large assumptions:

- that the diseases included are acceptable indicators of the much larger group of possible diseases and
- that the proportionate change in the incidence of these diseases can be translated directly into proportionate change in GP consultations.

These are rather heroic assumptions but given limitations on the information available they will provide a rough indication of the direction and scale of change in health status across the projection period.

Between 2006 and 2021 the combined incidence of the diseases within the morbidity measure are projected to increase by 12 per cent overall with the proportion increasing by 14.4 per cent among men and 10 per cent among women. These significant positive changes in the level of morbidity can be applied to the projections for growth in GP consultations over the same period. Doing so produces the figures shown in Table 3.9.

Table 3.9: Percentage Change in Number of GP Consultations Over 2006 to 2021 by Sex (Including Epidemiological Change)

	2007	2010	2015	2021
Men	4.6	15.3	34.0	59.8
Women	3.6	11.6	24.0	40.6
All	4.0	13.1	27.9	48.2

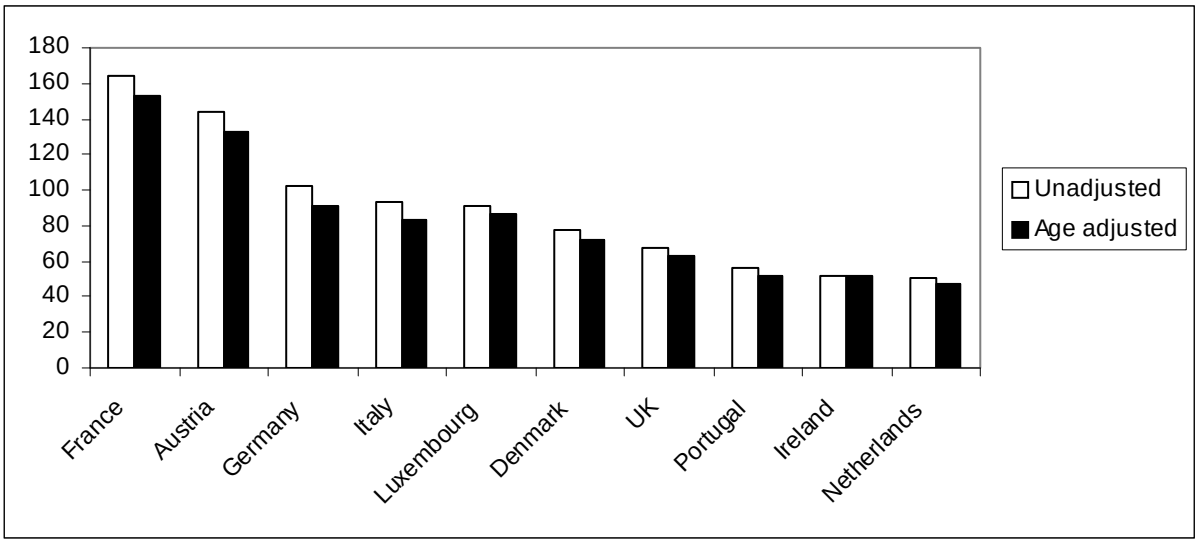
When compared to Table 3.4 above, this shows very significant additional increases in GP consultations in each year up to 2021. For example, demographic change alone is projected to lead to the number of consultations increasing by 9.4 per cent by 2010, but Table 3.8 shows that this is increased by 3.7 per cent by worsening epidemiological trends over the same period. By 2021 epidemiological trends are projected to increase consultations by a further 15.7 per cent overall, a figure that rises to 20.1 per cent among men (12.8 per cent among women). In the PA Consulting report to the HSE (PA Consulting Group, 2007a) a further inflation factor of 1 per cent a year representing change in the demand for health care as a result of changing levels of access, technology and expectations was also applied. It is debatable whether this factor should be applied in the context of GP consultations given the reduction in access that is likely to occur with the projections described in this section. Nonetheless, if such an increase in demand were to occur it would worsen an already difficult trend. An increase of almost 50 per cent in GP consultations by 2021 is a major cause for concern given current trends in the training and availability of GPs.

3.11 The Supply of GPs in the Republic of Ireland from 2008 to 2021

The limited supply of GPs has been highlighted as a major capacity constraint in the current health care system (Thomas, Normand *et al.,* 2008). According to recent OECD data, Ireland had only 52 GPs per 100,000 population in 2004, an extremely low ratio for a high income country (see Figure 3.3). ICGP membership data implies a slightly higher figure of 61 GPs per 100,000 population in 2004, falling to 56 for 2008. Yet, even using these slightly higher figures, the GP to population rate in Ireland is very low in comparison to other EU 15 countries,[4] for which data are available (Nkhoma and Thomas, 2008). Indeed, only the Netherlands has a marginally lower ratio, with several countries having over 100 GPs per 100,000 (namely France, Austria and Germany). Ireland may thus appear to be chronically undersupplied with GPs in comparison to EU states at similar per capita income levels.

It may be countered that Ireland has a younger population than many other Western European countries and, therefore, that such an international comparison is unfair as ageing populations require more GPs. To take account of this the authors also include data in Figure 3.3 which compares GPs per equivalent population in each country. While this makes a slight difference to the ranking, Ireland is still third lowest in its availability of GPs.

Figure 3.3: Availability of GPs Within the EU, 2004



Source: Nkhoma and Thomas (2008), Eurostat (2009).

In the light of this apparent current shortage it is vital to review the future demand and supply balance for GP services. To do this the authors in this chapter draw on current trends in GP supply and the project's population projections to estimate future patterns of, and gaps in, service provision as a whole and across counties. Finally, the authors explore potential government interventions to resolve supply-side deficiencies.

[4] Definitional problems (proportion practicing) and differing sources of information (surveys, professional registers) within the OECD database make comparisons problematic.

FORECASTING AGGREGATE SUPPLY AND DEMAND

To investigate how the primary health care system will evolve it is important to review existing information on the characteristics of GP supply. As well as the Layte *et al.* (2009a) report on existing services and the Morgenroth (2009) analysis of future population dynamics, this chapter draws on available data, and related analyses, on GP supply, retirement, training and gender balances from Thomas, Normand and Smith (2008) and O'Dowd, O'Kelly and O'Kelly (2006). Thomas, Normand and Smith (2008) explored capacity constraints within the market for GP services and supply deficiencies in the face of current demand and future policy options. O'Dowd, O'Kelly and O'Kelly (2006) outlined GP supply trends, behaviour and preferences from the results of their survey of 545 GPs.

The bases for projecting future aggregate supply and demand are:

- Population projections by county.
- Fixed GP to population requirements.
- Current GP training places (121).
- Increases in general medical education in line with government policy.
- Continuation of current trends in workforce gender balance and retirement.
- Lags in new supply of GPs caused by the length of GP training.
- No change in the current trade of GPs between Ireland and other countries.
- Future distribution of *new* GPs will occur according to the *historical* distribution patterns of GPs.

FORECASTING DISTRIBUTION

The data on the distribution of actual numbers of GPs across the counties in the Republic of Ireland is drawn from various sources. The data were extracted from Irish College of General Practitioners website, their membership list and the Irish Medical Directory for the years 2004 to 2008 (with 2008 data being preliminary data). Not all GPs are members of the ICGP and also not all members of the ICGP agree to their names being advertised on the ICGP website. Hence, it was necessary to check such data against membership records of the ICGP by Faculty (geographic area) and by the listing of GPs by county in the appropriate years of the Irish Medical Directory. Using these sources a total of 2,495 GPs were captured and located by county for 2005 respectively, up from 2,030 listed on the ICGP website. As a further check, a study by Teljeur *et al.* (2008) estimated the number of GPs in 2005 (compiled from lists for the GMS and the 'mother-to-be and infants' schemes) to be 2,477 in 2005. This independent assessment is within 1 per cent of the authors' estimate.

Estimating the future distribution of GPs is made more complex because there is, at least in theory, a market mechanism in operation. Nevertheless, the market for GPs is complex. While a higher supply of GPs might theoretically improve competition and bring prices down (Indecon

2003), literature shows that in such a high supply setting GPs may induce demand through repeat visits in order to boost income (Tussing and Wojtowycz, 1986).

The current undersupply of doctors is consolidated by the lagged nature of new supply as it takes at least six years to train a GP. Further, it is unclear how easy it is for GPs to shift locations in response to new demand, given the high costs of setting up new practices and the costs and difficulties associated with moving. All this may place, and indeed has placed, limits on the ability of the market to correct imbalances between supply and demand without government intervention.

The last assumption deserves some exploration as it appears quite conservative. It allocates the balance of GPs coming into the system across the counties based on where GPs are already present. This reflects the reality that most GPs aim to join an existing practice (Nkhoma and Thomas, 2008). This is not only because of the high start-up costs and the risks of developing a new practice. By joining an existing GP practice new GPs are more liable to inherit a medical card list, which can be extremely profitable (as discussed later). As will be seen, the importance of "inheritance" creates inertia in the current market for GP services.

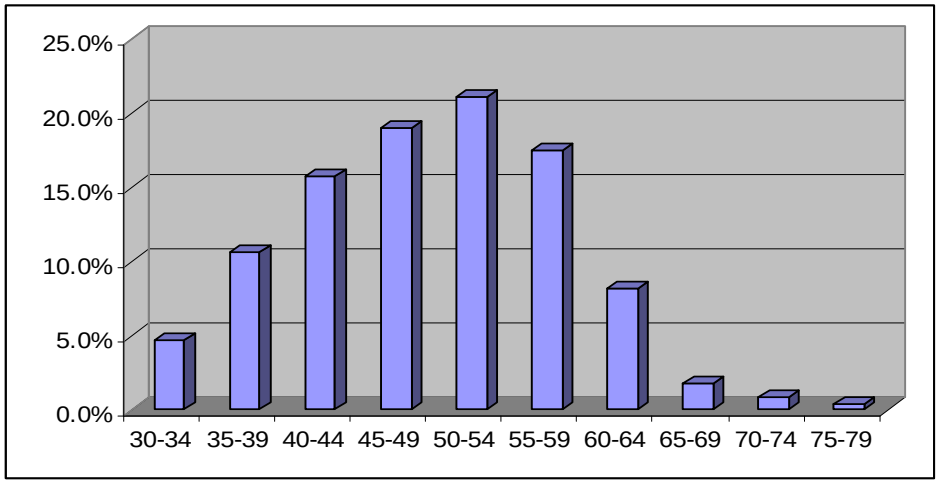
3.12 Current GP Supply Trends

Data over time on numbers of GPs in Ireland is difficult to obtain. However, data from the Department of Health and Children (Department of Health and Children, 2007) shows that in 2005 there were estimated to be around 2,500 GPs in Ireland (as per our estimate) up from approximately 1,900 in 1992 and 1,800 in 1982. This translates to an annual average increase of 54 GPs each year from 1992 to 2005. There are indications, however, that this growth has flattened off in recent years, with only a 1 per cent growth between 2004 and 2008, according to the ICGP data for 2008. This has resulted in a steady decline in the number of GPs per capita in Ireland, from 61 in 2004 to an estimated 56 in 2008.

According to O'Dowd, O'Kelly and O'Kelly (2006) the average age of GPs was approximately 51 in 2005, with rural areas having an older cohort. Given that in a few years many of these GPs will retire, this may create a problem in supply with knock-on effects for patient access as noted by the Buttimer report (Department of Health and Children, 2006). The 2005 GP age distribution is highlighted in Figure 3.4.

Another key trend highlighted in the O'Dowd *et al.* (2006) survey is the increasing feminisation of the GP workforce. The survey estimated that in 2005, 30 per cent of GPs were women, up from 15 per cent in 1992 and 12 per cent in 1982. According to more recent ICGP data on their members (which account for around 90 per cent of all practising GPs in Ireland) on average, between 2004 and 2008, 40 per cent of GPs were women (Irish College of General Practitioners 2008). Their data show an increase in female GPs of 31 between 2004 and 2008 at the same time that the number of male GPs decreased by 16.

Figure 3.4: Proportion of GPs by Age Range, 2005



Source: O'Dowd, O'Kelly and O'Kelly (2006).

The impact of these two key features, ageing and feminisation of the workforce, are important to explore as they signify changes in supply. O'Dowd, O'Kelly and O'Kelly (2006) suggest that fewer female GPs consider themselves in full-time practice (80 per cent as opposed to 96 per cent for male GPs); implying that increasing feminisation of the workforce may impact on the number of GP Full-Time-Equivalents (FTEs). Further, increasing feminisation may decrease the average retirement age of the workforce, as female GPs have a preference for earlier retirement. The survey also suggests that female GPs wish to retire on average 3 years earlier than their male counterparts.

Given current age profiles this means that, between 2006 and 2010, over 350 GPs will retire. The number retiring is projected to grow to 450 between 2011 and 2015 and to over 500 between 2016 and 2020 (authors' calculations).

3.13 Projected Aggregate Need for GPs

Apart from factors relating to feminisation and ageing, population growth will also require an increase in the number of GPs just to maintain the existing GP to population ratio, let alone improve that ratio. Indeed, given the importance of strengthening community services noted in the PA Consulting Group (PA Consulting Group, 2007a) review of the acute hospital sector, it is essential that the GP to population ratio is improved significantly. For that reason, the authors also include an estimate of scaling up of GP supply to reach the 87 GPs per 100,000 population by 2021. (This represents an EU average for GPs per 100,000 adjusted by Ireland's relatively younger population.) While this number is not linked with the PA Consulting Group acute hospital review it does provide an idea of the scale of investment needed to rapidly boost supply up to levels comparable with other high income European countries.

Table 3.10 and Figure 3.5 outline the number of additional GPs required in order to keep pace with retirement and population growth from 2006-2021. It is estimated that approximately 119 additional GPs will be needed each year between 2006 and 2010, increasing to just 121 per annum between 2011 and 2015 and reaching 126 per year between 2016 and 2021. Further Table 9 and Figure 3 also highlight that to reach a GP to population ratio comparable to the EU average would require a further 113

GPs trained each year. Consequently, to reach an EU average GP population ratio would require an additional 3,530 FTEs by 2021. Population growth accounts for only one-seventh of this need for expansion.

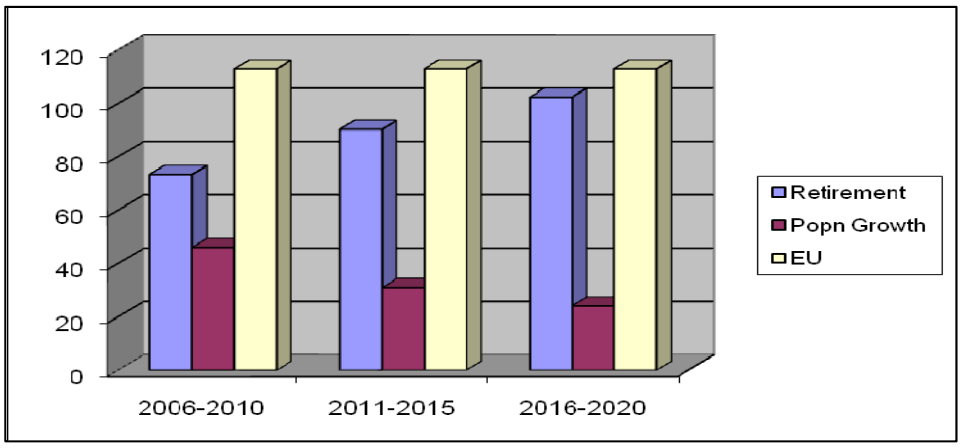
Table 3.10: Additional FTE GPs Required Per Year to Meet Retirement, Population Increases and EU Average, 2006 to 2021

	Retirement	Population Growth	Sub-Total	EU Average	Total
Per annum (2006-2010)	73	46	119	113	194
Per annum (2011-2015)	90	31	121	113	196
Per annum (2016-2021)	102	24	126	113	201
Grand Total (2006-2021)	1,433	529	1,962	1,695	3,530

Key Assumptions:

1. Population growth in line with project projections.
2. Retirement of female GPs is on average three years earlier than male GPs.
3. EU average GP: 1000,000 population is 102. Nevertheless, Ireland has a younger population and adjusting for this gives Ireland a target of 87 GPs per 100,000.

Figure 3.5: Additional GPs Required Per Year To Cope With GP Retirement, Population Growth and Increasing Supply to the EU Average, 2006-2021



3.14 Supply Dynamics

It is important to investigate how realistic it would be to achieve such increases in GP supply in the Irish context. The Fottrell report highlights the constrained supply of doctors into the Irish health system (Department of Health and Children, 2006). The annual intake of doctors into medical training in 2003/04 was around 760, approximately 60 per cent of which were non-EU. This left only 305 candidates from EU countries that were potentially more easily employable within the Irish health system. To meet the additional GP supply requirements, in the absence of additional places for medical education this would have required between 30 per cent – 60 per cent of all EU newly trained doctors becoming GPs per annum.

The Fottrell Report estimates that the Irish system requires the employment of 725 doctors per year (Department of Health and Children, 2006) and the Buttimer report (Department of Health and Children, 2006)

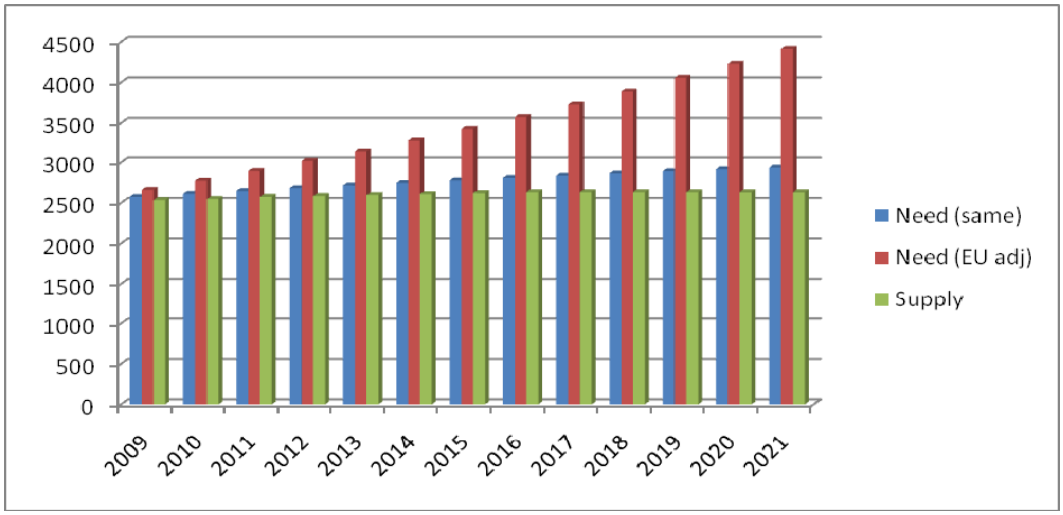
that the number of places for GP training needs to increase to 150 per year. Current government policy endorses this expansion of medical education with a move to 60 per cent of all medical students being from EU countries in four years, which will create a throughput of 456.[5] Nevertheless, it is clear that there are competing needs and claims on these extra doctors. GP training places have increased recently to 121, but they have not climbed to the 150 mark as endorsed by government (ICGP, 2008).

It is important to reflect on the implications of this current supply pattern. Even if all the new trainee GPs take-up Irish posts immediately, the extra 121 GPs per year would not be able to cope with the projected population increases and retirement patterns. Further the move toward an integrated system, with improved community services, would require even more GPs.

Such shortfalls are highlighted in Figure 3.6 and Table 3.11, where the supply of Irish GPs based on current training capacity is plotted against two need scenarios:

- Need (Same) – which preserves the same GP to patient ratio as in 2008.
- Need (EU adjusted) – which increases the GP to patient ratio up to an EU average level (adjusted for the relatively younger population in Ireland).

Figure 3.6: Projected Need Versus Supply, 2009-2021 in FTEs



[5] Simple substitution of Irish candidates for non-EU students will not, by itself, help as the medical schools rely on non-EU students as an important source of income. Substitution of just one year's intake of non-EU students with EU students would result in a loss of €13 million in revenue from student fees in a single year, amounting to approximately €70 million over the duration of the medical training programme. Department of Health and Children (2006). *Medical Education in Ireland: A New Direction.* Report of the Working Group on Undergraduate Medical Education and Training. Dublin.

Scenarios for the expansion of GP training are modelled in Table 3.11. This estimates what difference expanding training would have on the GP to population ratios. As can be seen the move to 150 GP training places will still fail to hold constant the GP to population ratio and this is even assuming lower migration of Irish trained GPs. An expansion to 250 GP places would certainly compensate for retirement and population growth and start to make real progress in improving the supply of GPs toward an adjusted EU average.

Table 3.11: Projected Need Versus Supply

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Need (Maintain Same Ratio)	2,575	2,611	2,646	2,681	2,714	2,747	2,778	2,808	2,837	2,865	2,891	2,917	2,937
Need (Improve Ratio to EU)	2,660	2,775	2,894	3,019	3,149	3,285	3,427	3,574	3,728	3,889	4,057	4,232	4,414
Supply (No Change)	2,535	2,548	2,576	2,586	2,597	2,609	2,621	2,632	2,632	2,632	2,631	2,631	2,631

Table 3.12: GP Training Scenarios and the Impact on GP to Population Ratios (GPs Per 100,000)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
GP supply (No Change)	56.6	56.5	55.9	55.5	55.0	54.6	54.2	53.6	53.1	52.6	52.1	51.6	51.2
GP Supply (150 Places)	58.3	58.5	58.4	58.3	58.3	58.2	58.2	58.0	57.8	57.6	57.5	57.4	57.4
GP Supply (250 Places)	62.5	64.8	66.7	68.5	70.4	72.2	74.0	75.6	77.1	78.7	80.2	81.8	83.5

Note: The '150' and '250' scenarios assume current rates of Irish GP migration to other countries will halve.

If there is no expansion of the existing GP supply there is likely to be a shortfall of approximately 1,800 GPs by 2021 if the EU target is to be reached and over 300 GPs if only population and retirement are to be compensated for. If there is an immediate increase to 150 GPs being trained annually, it is estimated that the shortfall will decrease to 1,500 GPs by 2020 for the EU target and the population and retirement target will be met. An immediate expansion of GP training places to 250 would allow supply to move Ireland significantly toward the EU GP to population ratio.

Even with expanded training, there is a significant loss of trained GPs to other countries. For example, the Career Tracking Study (McEntee, Daly *et al.*, 2005) noted that of all 1994 and 1999 medical graduates working as GPs 29 per cent and 43 per cent respectively were now practising in other countries. Such high attrition undermines GP supply and it is important to review how to limit this.

A failure to expand GP supply would have knock-on effects which could include price increases, longer waiting lists and an increased burden on Emergency Departments in hospitals as patients seek alternative modes of care. There are tentative indications that individuals who hold neither private health insurance nor a medical card (i.e. low-mid socio-economic status) are more likely to use ED services than they are to use primary care

services (Smith, 2007). There is also some evidence that the limited availability of primary care is linked with higher levels of emergency department utilisation, particularly non-urgent utilisation (Smith, 2007).

DISTRIBUTION OF GPS

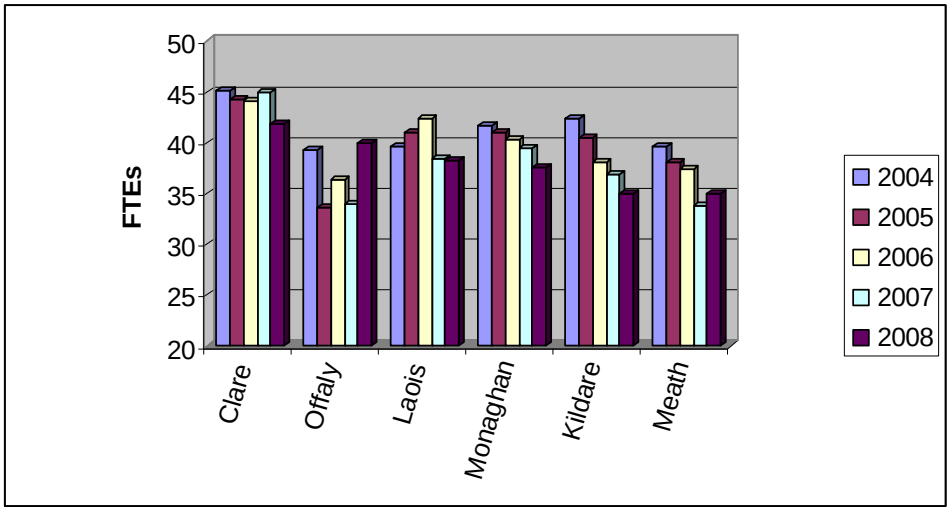
It is important to explore whether the overall shortage of GPs is and will be universal across counties and to identify which counties fare better and worse. Table 3.13 highlights the concentration of GPs across each county (using data for GP FTEs by county relative to the local population). Cork, Galway and Waterford appear to be the better supplied with an estimated average of more than 65 GP FTEs per 100,000 for 2008 while Clare, Offaly, Monaghan, Laois, Meath and Kildare have the worst ratios at less than 45 GPs per 100,000 in the same year. Indeed the GP/population ratio in Kildare is estimated to be almost half what it is in Cork.

Recent trends in the worst supplied counties are highlighted in Figure 3.7. In Monaghan and Kildare rising populations have been met with declining numbers of GPs over the 2004 to 2008 period, meaning that each county requires at least 30 more GPs to match the national average GP to population ratio. In Laois and Meath there have been increased numbers of GPs but bigger proportionate increases in population. The supply of GPs has improved in Offaly from a low level outstripping population increases, while the supply of GPs in Clare has not responded to the population increases in that county.

Table 3.13: GP FTEs Per 100,000 Population Across Counties, 2004-2008

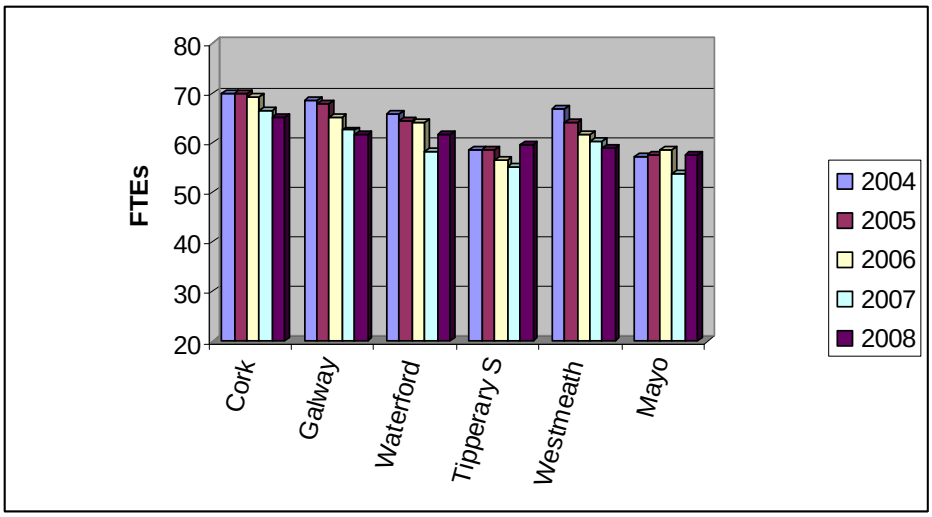
	2004	2005	2006	2007	2008	% Change
Cork	70	70	69	67	65	-7
Waterford	66	64	64	58	62	-6
Tipperary South	59	59	56	55	60	2
Mayo	57	58	59	54	58	1
Galway	69	68	65	63	62	-10
Dublin	56	55	56	53	54	-4
Limerick	59	61	59	53	56	-5
Sligo and Leitrim	56	54	59	54	57	1
Westmeath	67	64	62	60	59	-12
Kerry	59	59	58	56	53	-10
Tipperary North	50	48	49	51	54	10
Average	*56*	*55*	*55*	*52*	*52*	*-7*
Wicklow	61	57	56	53	54	-12
Donegal	53	55	52	49	48	-10
Carlow	59	56	52	49	50	-16
Louth	52	49	50	49	45	-13
Wexford	55	51	50	46	48	-13
Clare	45	44	44	45	42	-8
Kilkenny	44	46	47	40	43	-3
Longford and Roscommon	46	46	46	42	43	-6
Monaghan	42	41	40	40	38	-10
Cavan	48	46	44	42	43	-9
Offaly	39	34	36	34	40	1
Laois	40	41	42	38	38	-3
Kildare	42	41	38	37	35	-17
Meath	40	38	37	34	35	-12

Figure 3.7: FTE GPs per 100,000 in the Worst Supplied Counties, 2004-2008



Even in the better off counties only Tipperary South and Mayo have seen an overall increase in their GP to population ratio, with large increases in actual GP supply. In Cork, Galway, Waterford and Westmeath, the concentrations of GPs have been falling because of large population increases with very little response in GP supply (except in Westmeath where the actual number of GPs has also gone down), see Figure 3.8.

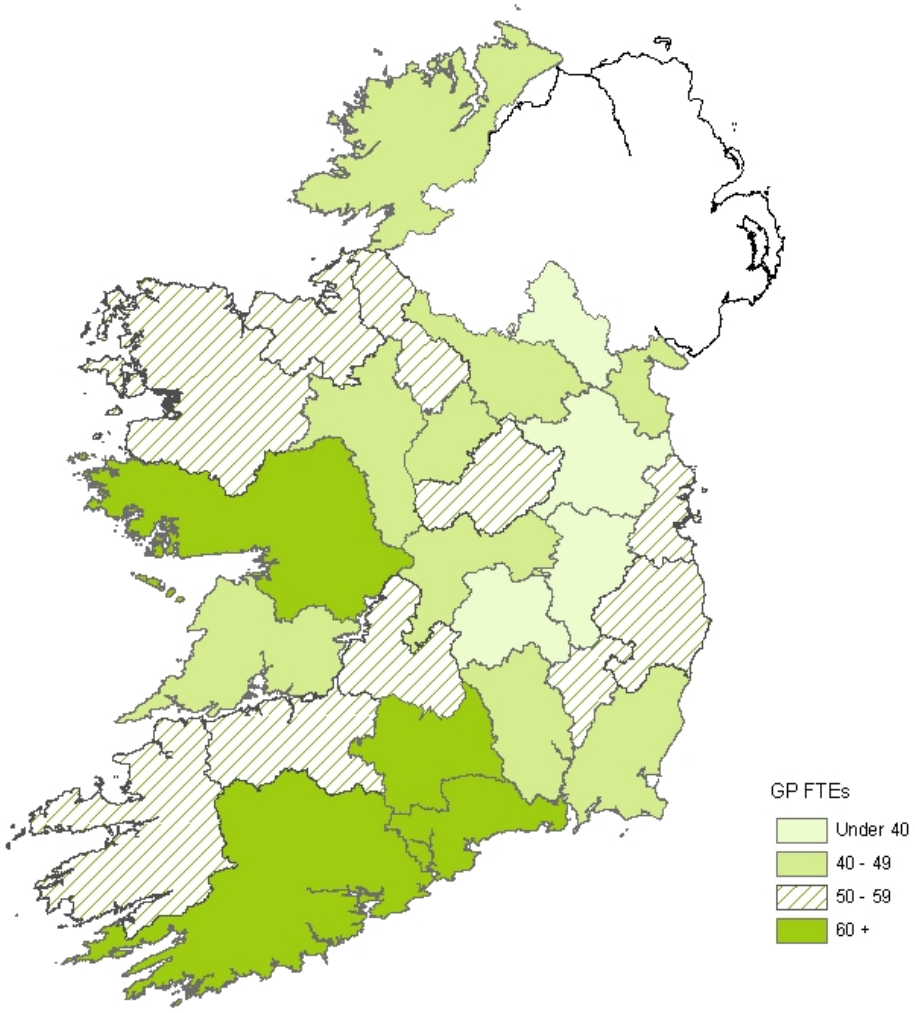
Figure 3.8: FTE GPs Per 100,000 in the Best Supplied Counties, 2004-2008



The feminisation of GPs effectively reduces GP supply by almost 200 FTEs. Hardest hit are Dublin, Tipperary North, Westmeath and Galway with around a 9-10 per cent reduction in actual supply of FTEs. These counties are however relatively better off in their original supply. Underserved counties typically have a lower proportion of female GPs and so are less badly affected. The exceptions to this are Meath and Monaghan, where female GPs account for 46 per cent of all GPs, well above the national average. Accounting for FTEs, Meath's already low GP to population ratio, of 39 GPs per 100,000 in 2008, worsens to 35 GP FTEs per 100,000.

The concentration of GP FTEs per 100,000 population in 2008 across the country is shown in Figure 3.9. This colour-codes by county the ratio of GP FTEs to the local population, with blue being better and red worse.

Figure 3.9: GP Concentration of GPs by County, 2008

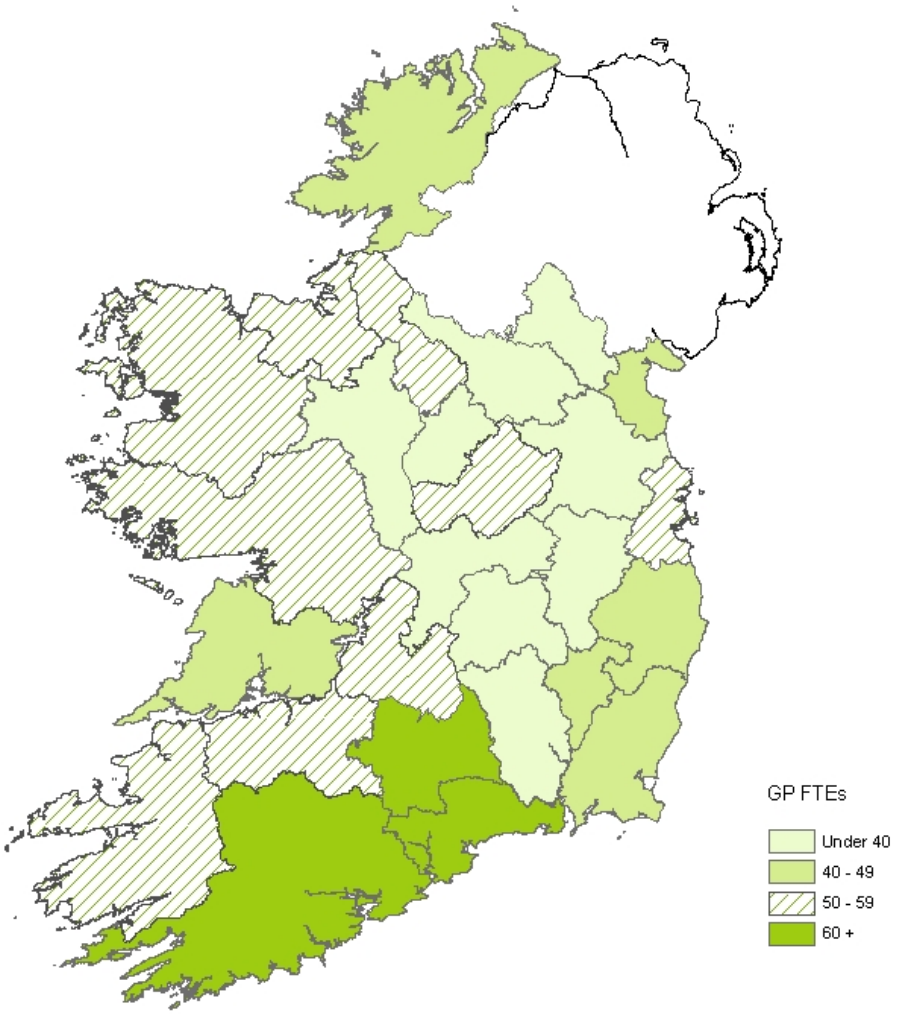


PROJECTIONS OF DISTRIBUTION

Those counties faring better between the 2008 and 2021 period are Dublin, Limerick, Tipperary South and Monaghan. The biggest losers over the same period are Meath, Laois, Cavan and Wexford. By 2021, it is projected that Meath will have only 27 GP FTEs per 100,000 population compared to 63 in Cork. Kildare and Laois will also have worse ratios than in 2008 with little over 30 GP FTEs. Without intervention there would seem to be a profound and worsening problem of distribution of GPs across the country.

The projected national picture for 2021 is shown in Figure 3.10. A key theme that emerges is a furthering of the East/West dichotomy highlighted in Figure 3.9. In particular in-land commuter counties in Leinster seem to be particularly hard hit.

Figure 3.10: GP Concentration by County, 2021



POTENTIAL GOVERNMENT INTERVENTIONS

To remedy the problem of limited supply in primary care there are several strategies for government:

- increase the number of students in medicine;
- increase the number of GPs trained per year;
- remove the barriers to entry, such as by helping with the start-up costs for new GPs and investigate ways for improving access to GMS lists (see below);
- facilitate the market entry of additional numbers of qualified GPs from other countries;
- consider using other professions to do some of the work currently conducted by GPs;
- encourage GPs to retire later or attract back qualified GPs who have left active practice; and

- investigate ways to make practice in underserved areas more attractive.

While it is essential to increase the number of GPs trained in Ireland, it is also important to realise that there is a general shortage of doctors in the Irish health system. Medical schools have traditionally faced capped numbers of EU students with incentive structures that favour the training of non-EU higher-fee paying students. Such capping and incentives have meant a limited supply of Irish doctors which has in turn generated fierce competition for doctors from across the system. Recent initiatives to expand doctor training must be continued so that any increase in GP numbers is not a loss to other parts of the system.

Nevertheless, it is also important to realise that other professionals, such as nurses and pharmacists, have the ability to do some of the jobs currently conducted by GPs. Careful use of the right skill mix might lower the need for training as many additional GPs. Such an initiative would have to be handled carefully, given stakeholder interests and the private nature of the GP market, but given the scale of need in the coming years it is an appropriate time to evaluate this option.

Relatedly, the Primary Care Strategy proposes that primary care be delivered through 'primary care teams' which are to include:

- GPs
- Nurse/midwives
- Health care assistants
- Home helps
- Physiotherapists
- Occupational therapists
- Social Workers
- Receptionists
- Clerical officers
- Administrators

These inter-disciplinary teams will come together, preferably in a single location, to serve a population of 3,000 to 7,000 people and will be integrated into a wider 'primary care network' made up of chiropodists, pharmacists, dieticians, psychologist and other health professionals. Although the strategy envisages 600 to 1,000 primary care teams nationally under the life of the current health strategy, in fact development has been very slow and only a fraction of that number have come into existence.[6] If this rate of development continues then the degree of change in the delivery of primary care by 2020 will be modest and the present fragmented system will largely remain. If, however, the proposed system were to be

[6] A response by the HSE to parliamentary question PQ11777/08 in April 2008 stated that there were 97 primary care teams operating in Ireland at that point. No information is available on the structure or functioning of these teams but very few were likely to be based in one location or have the full complement of professions available, a point made in the response.

developed it would have a major impact on the delivery of care and could be used as a basis for thinking through how other professionals could substitute for GPs, to alleviate current and expected shortages.

While it may also be expedient to attract foreign-trained GPs into Ireland, this strategy may be the most questionable. Currently, there is a world-wide shortage of doctors. Poaching doctors from already under-served low and middle income countries runs counter to Irish Aid's focus of improving the retention of health professionals in aid-recipient countries. According to Tussing and Wren (2006) almost 20 per cent of all physicians in Ireland were trained overseas. Hence, the dependency on foreign GPs to make up the numbers is not going to change for some time.

Research into GP motivation is essential to understand what sort of package of incentives might be effective in increasing the supply of GPs and also ensuring that rural areas are more adequately covered. Currently, not enough is known about this important topic, though recent studies including Nkhoma and Thomas (2008), and Teljeur, Thomas *et al.* (2008) have started to explore issues around GP motivation and location.

A key element in improving the motivation of GPs is boosting their income. All GPs are self-employed private practitioners, government funding through medical card payments makes up the majority, approximately 60 per cent, of their funding (Thomas, Normand *et al.*, 2008). In the current system the majority of GPs hold a contract with the government to treat medical card patients and are reimbursed on a capitation basis for these patients. The fees represent the sum of two elements:

- A demographic factor designed to reflect differences in demands by various groups (age and gender).
- A geographic factor designed to reflect the expenses incurred in visiting patients in various age/distance categories.

Apart from capitation rates GPs also are eligible for out-of-hours fees, allowances for special leave and other supplementary allowances (such as equipment maintenance, out of hours arrangements, study leave, practice manager, medical indemnity). Further, there is a specific rural practice allowance for those who live and have their main centre of practice in a population centre of less than 500 and there is a remote area payment for those who live and work in remote areas. Such payment mechanisms represent tools by which government can work to structure better incentives for GPs.

Nevertheless, recent OECD data reveal that Irish GPs are well paid in comparison to their colleagues in other EU 15 countries. In Ireland GPs are paid four times the GDP per capita value, which is a higher multiple than in the UK, Germany and the Netherlands and much higher than in France and Sweden. Thus, it will be important to identify which factors, in addition to expected income, are important in choosing general practice as a career and in choosing a location of practice.

3.15 Discussion and Conclusions

This chapter has examined the number and distribution of general practitioners, the pattern of GP utilisation in the population and the impact which demographic change may have on the demand for GP care. The first part of this chapter showed that demographic change will have a significant impact on the demand for GP care in the period to 2021 and beyond. Overall population increase will be significant between 2006 and 2021 with Ireland experiencing a 21 per cent increase, but this overall increase will interact with population ageing to increase the level of demand. Analysis of the pattern of GP utilisation in this chapter shows that older individuals, and particularly those over the age of 80 years, are significantly more likely to visit their GP. Although the oldest old (80+) are a comparatively small part of the population their numbers will almost double by 2021. Together with the overall population growth projected this will lead to a 33 per cent increase in GP consultations by 2021 at a time when the density and number of GPs available is falling quickly.

The projected increase in GP consultations will be particularly pronounced in the counties surrounding Dublin where overall population growth and ageing will have a dual impact in increasing the level of need. This will mean that these counties will probably experience severe shortages in the availability of GP care by 2021 with implications for health and welfare as well as the cost of GP care. It will also seriously impact on the ability of government to deliver health care reform.

The analysis in the second part of the chapter shows that compared to other countries Ireland has a low number of GPs per capita and that this impacts on the availability of GP care, particularly in some deprived urban areas. However, given current GP training capacity alongside projections of GP retirement and population growth, the availability of GPs per 100,000 population will worsen from 2008 to 2021. The decreasing density of GPs in the population may significantly impact on the availability of GP care over the next decade and beyond at a time when professed government policy is the expansion of care in the community and movement away from acute care in the hospital sector. It now seems unlikely that a decrease in the density of GPs can be avoided but GP training capacity must increase immediately if the medium term outlook is to be improved. The government approved target of 150 GP training places will not deal with the projected impact of retirement, population growth and feminisation. If government is to implement the recommendations of the acute hospital bed review (PA Consulting Group, 2007a) to boost community services, GP training capacity must increase immediately to 250 per year. Such an expansion will be extremely important as the government looks to enhance primary care in general and reduce the need for extra acute hospital beds, in line with the key scenario of the PA Consulting report to the HSE (PA Consulting Group, 2007a). Without a significant expansion in GP numbers it is difficult to see how primary care can be sufficiently boosted.

Furthermore, there appears to be a growing East/West divide in the availability of GPs for the population and this trend will become more pronounced. In particular, in-land commuter counties will be the hardest hit in terms of reduced GP availability. Meath, Kildare and Laois are chronically short of GPs for their populations. It is imperative that government acts to redress these imbalances and find ways to get GPs into these under-supplied areas.

This chapter with its new data on GP supply and distribution has opened up a rich seam for new and important research. Particular themes that need further analysis are:

- International comparability of age-related need for primary care and how Ireland compares with other EU countries
- Human resource planning around GPs including issues of
  - training
  - costs
  - skill-mix and the delegation of tasks to other professionals
  - incentives to choose general practice as a career
  - incentives to choose the location of general practice
- Regulation of the GP market by government and its use of GMS lists.

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4. OUTPATIENT SERVICES

Richard Layte

4.1 Introduction and Chapter Plan

This chapter looks at the area of outpatient care in Ireland. Although there is no agreed definition of outpatient care, the term is commonly taken to encompass the care provided by clinics within hospitals for patients who are not currently inpatients within the hospital at that point or attending for a day procedure. But the term is also often taken to cover the activities of specialist doctors working outside the hospital sector (both private and public) in smaller clinics or their own specialist surgery space. The majority of both public and private outpatient care is provided within public hospitals, but a significant proportion of private secondary, specialist care is also provided outside of the public hospital sector in private hospitals, clinics and surgeries. The increase in proportion of the population with health insurance over the last decade in Ireland has probably increased the level of private outpatient care although no data are available to confirm this. The extent of private provision of outpatient care has important implications for the availability of care and its distribution across the population. We return to this in more detail later in the chapter.

In this chapter we first examine trends in outpatient utilisation in administrative data before moving on to the projection of levels of outpatient utilisation from 2007 to 2021. Projection analyses are performed for the total population and then for the three age groups which are available in the administrative data from the National Hospitals Office. Using a number of assumptions, the impact of population projections across hospital networks are also then examined.

4.2 Data and Methodology

The majority of both public and private outpatient care is provided within public hospitals in Ireland but a significant proportion of private secondary, specialist care is also provided outside of the public hospital sector in private hospitals, clinics and surgeries. Records of public hospital consultations nationally are collated by the Performance Monitoring Unit of the National Hospitals Office (NHO) of the Health Service Executive (HSE). Unfortunately, national data are only available from 2006 onward although data for the Dublin Hospitals in what was the Eastern Region Health Authority (ERHA) are available from 2001 to 2006. These hospitals carried out over 57 per cent of all public outpatient consultations nationally in 2006 and so are likely to closely approximate national developments although the lack of national longitudinal data is clearly not ideal. The

NHO data provides information on a limited range of areas including the sex and age of patients (in three categories: less than 18 years, 18 to 64 years and 65+ years) as well as whether the consultation is a new or return visit, the hospital and health board where it took place and the specialty of the consultant undertaking the consultation.

The vast majority of outpatient care is also provided in the public service but there is a significant level of private outpatient activity, often in public hospitals. Unfortunately, this activity is not recorded and so is not available for analysis. Given this, in this chapter we focus solely on data provided by the NHO and seek to examine the impact which demographic change will have on the demand for and delivery of public outpatient services to 2021.

Our approach to projecting the requirement for outpatient care to 2021 is very similar to the approach taken in the last chapter on GP care as the data available are very similar. First we harmonise the demographic projects that we have with the data on outpatient care, that is, we construct demographic projections for three age groups (less than 18 years, 18 to 64 years and 65+ years) by sex. We then use these projections to inflate or deflate the patterns of utilisation found in the NHO data for 2006. Once we have established this projection on a current use basis we then examine the impact of different assumptions for trends in outpatient care based on the ERHA patterns observed between 2001 and 2006. Lastly, we also inflate the current use and trend inflated projections by our epidemiological projections. The complex pattern of referral for outpatient care in Ireland means that break downs by geographical area are not easy to perform. However, by applying a number of assumptions and using data on referral patterns for inpatient care we produce projections by hospital network. A full account of the approach taken is provided below.

4.3 Measuring Trends in Outpatient Utilisation

In the first chapter of this report we discussed the important distinction between supply and demand factors in determining levels of utilisation. The 'need' for health care among some groups, notably older people or those with lower levels of income means that we see higher levels of demand and utilisation among these groups compared to others. However, the available supply of health care is also important in determining patterns of utilisation and this is particularly true in the area of outpatient care where under supply has led to lengthy waiting times for public patients. The extent of this under supply is not well understood as there are no systematic data on the numbers waiting. However, some data for those aged 65 years or more are available from the Health and Social Services for Older People Survey (HeSSOP – see O'Hanlon *et al.*, 2005) which was carried out in 2004. This shows that 7.1 per cent of those aged 65+ years (32,838) were waiting for an outpatient appointment in 2004. Those who were waiting had been on the waiting list for an average of 16 weeks, but 27 per cent had been waiting more than a year and 10 per cent had been waiting more than three years.

4.4 Trends in Outpatient Consultations

In terms of public outpatient consultations, the only data available that allow us to examine trends over time are for the Dublin Hospitals in what was the Eastern Region Health Authority (ERHA). Data are available for 2001 and 2006 and show that there has been a 44 per cent increase in total volume over the period. This increase is not uniform over age groups however. Among those under the age of 18 years there has been an increase of 17 per cent in total consultations whereas among those aged 18 years to 64 years and 65+ years, the number has increased by 47 and 58 per cent respectively. It is important to understand the reasons for this very large increase if we are to project the demand for and delivery of future levels of outpatient care.

Although there was some population growth and population ageing between 2001 and 2006, this is far outstripped by the increase in consultations. For example, the overall population increase of 8.2 per cent and increase among the over 65 year olds of 7.3 per cent is far outstripped by the 44 per cent rise in consultations. However, over the period there was a substantial increase in the number of both consultant and non-consultant doctors within Irish hospitals. The former increased by 33 per cent from 1,574 to 2,096 and the latter by 25 per cent from 3,726 to 4,648 (DoHC, 2007) between 2001 and 2006. At the same time there was a concerted effort by central government to decrease the significant waiting times being experienced for outpatient care and this translated into a pressure through out the public hospital system to increase the number of clinics and throughput within clinics. Given this, it could be that the large increase over the period is actually the result of a substantial increase in the supply of services rather than an increase in the demand. On the other hand, it could be that the large rise in consultations that occurred is simply an artefact of better data collection and reporting over the period. The NHO acknowledge that data collection did improve over the period but cannot quantify the impact that this had. It could, of course, also be that the large rise in consultations that occurred is a combination of both effects.

Either way, it is likely that the rate of growth in supply will not continue into the future. Budget restrictions brought in as part of the October budget of 2008 will block further expansion in the short term and in the medium term it is likely that expenditure growth will moderate as overall national income growth slows from the rates experienced in the late 1990s and early 2000s. Similarly, the rate of improvement in data reporting are probably negligible at this stage so it is likely that increases in the number of consultations reported from this source will slow. One countervailing process may be the implementation of the new contract for hospital consultants. The successful renegotiation of the consultant's contract was meant to precede the recruitment of a large number of extra hospital consultants. If this were to occur it is likely that the number of outpatient consultations would rise.

No national data on waiting lists for outpatient appointments are available so it is impossible to assess the extent to which the increase in consultations over recent years has decreased the back log of referrals into the system. If it has it is likely that at some point in the medium term the incidence of new patients requiring care will peak and begin to decline. If population growth and ageing counterbalance the decrease in the backlog

of past cases this may lead to a plateauing or even increase in need for outpatient services.

4.5 The Impact of Changing Policy

The projection methodology used in this chapter is a combination of a population projection model combined with an analysis of current utilisation patterns. Such a simple analysis has its benefits but it cannot take into account the possible impact which changes in national health policy may have on the supply of health care and outpatient care in particular. There are a large number of possible practice and policy changes which could impact on outpatient care in Ireland. One good example is the picture of possible change presented in the PA Consulting Group report *Acute Hospital Bed Capacity Review: A Preferred Health System in Ireland to 2020* which was published in 2008 (PA Consulting Group, 2007a; 2007b). This report sets out a vision of change in which health services are configured locally around the patient rather than centrally around hospitals via the expansion of primary care facilities including greater access to diagnostic services. Currently, almost three-quarters of outpatient consultations are return visits (Layte *et al.* 2009), largely so that the consultant can monitor progress.

If primary care were to develop in the direction set out in the PA report just mentioned (i.e. in the direction set out in the Primary Care Strategy, DoHC, 2001) then many of the follow up work which is being carried out in repeat visits to outpatient clinics could be transferred to primary care thus drastically reducing the number of outpatient consultations. This would be a positive development in terms of freeing up expensive hospital resources although such savings would need to be set alongside the costs of increasing the services available to primary care and paying GPs to carry out the follow up care.

Another possible policy change that would have a substantial impact on outpatient care, primarily through the redistribution of care across the country, is the implementation of the recommendations of the Hanly Report (DoHC, 2003) which argues that health service regions should become largely autonomous of each other in terms of their ability to provide the majority of specialty care required for their population. Although national centres of excellence would require some travel by patients for services, an increase in the availability of services locally would mean substantial changes in the distribution of outpatient consultations across the country. At present close to half of all consultations occur in Dublin hospitals and half of the patients attending outpatient clinics in Dublin come from outside of the Dublin region.

4.6 Projecting Overall Public Outpatient Consultations

As shown in the first chapter to this report the total population of Ireland is projected to increase substantially in the period to 2021 under the assumptions of the central projection adopted in this project (M2F2). Table 4.1 shows that overall population numbers are projected to increase by over a fifth or 21 per cent between 2006 and 2021.

Population growth will not be uniform across age groups, however, with older age groups projected to increase at a substantially higher rate than younger age groups. Table 4.1 shows that whereas children aged under 18 years are projected to increase by almost 12 per cent by 2021, the

proportion aged 18 to 64 years will rise by 16 per cent and the proportion over 65 years by 69 per cent.

Table 4.1: Projected Increase in Population By Age Group 2006-2021

	2006	2010	2015	2021
Aged <18 years	1,036,034	1,091,155	1,149,026	1,157,021
% Change on 2006	-	5.3%	10.9%	11.7%
Aged 18-64 years	2,735,888	2,943,832	3,065,817	3,183,546
% Change on 2006	-	7.6%	12.1%	16.4%
Aged 65+ years	467,926	509,951	639,466	792,067
% Change on 2006	-	12.7%	36.7%	69.3%
Total	4,239,848	4,499,396	4,854,310	5,132,633
% Change on 2006	-	7.6%	14.5%	21.1%

The first report of this project (Report 1: *Recent Demographic Trends and their Impact on the Delivery of Health Care in Ireland*) showed that the average number of outpatient consultations among older age groups per capita per annum was far higher than among younger age groups. The average number of consultations among those aged under 18 years in 2006 was 0.27 whereas this number increases to 0.75 among those aged 18 to 66 years and 0.96 among those aged 65+ years, almost four times the rate.

The combination of higher utilisation rates among older age groups paired with an differential rates of increase at older age means that the rate of outpatient consultations should increase at a higher rate than the overall population. This is shown by Table 4.2 which shows overall outpatient consultations increasing by almost 25 per cent by 2021, 3.4 per cent higher than the population increase over the same period.

Table 4.2: Projected Increase in Outpatient Consultations By Age Group 2006-2021

	2006	2010	2015	2021
Aged <18 years	275,581	290,243	305,636	307,763
% Change on 2006		5.3%	10.9%	11.7%
Aged 18-64 years	2,053,403	2,209,474	2,301,029	2,389,390
% Change on 2006		7.6%	12.1%	16.4%
Aged 65+ years	450,311	490,754	615,394	762,249
% Change on 2006		12.7%	36.7%	69.3%
Total	2,779,295	2,961,869	3,222,059	3,459,402
% Change on 2006	-	8.2%	15.9%	24.5%

Source: Calculations based on NHO National outpatient data 2006.

The changing population composition will also change the proportion of outpatient consultations falling to different age groups as shown by Table 4.3. Here the proportion of consultations among those aged under 18 years falls from 9.9 per cent of the total in 2006 to 8.9 per cent by 2021. Among the middle aged group we also see a fall from 74 per cent to 69 per cent. For those over the age of 65 years on the other hand Table 4.3 shows a substantial increase in the share of outpatient consultations from 16 per cent to 22 per cent.

Table 4.3: Projected Distribution of Outpatient Consultations By Age Group 2006-2021

	2006	2010	2015	2021
	%	%	%	%
<18 years	9.9	9.7	9.5	8.9
18-64 years	73.9	73.7	71.4	69.1
65+ years	16.2	16.6	19.1	22.0
Total	100.0	100.0	100.0	100.0

Source: Calculations based on NHO National outpatient data 2006.

4.7 Projecting Public Outpatient Consultations Including Growth and Epidemiological Forecasts

As explained above, there was a 44 per cent increase in the number of outpatient consultations in ERHA hospitals between 2001 and 2006. This is the average rate of increase across all age groups and rates of increase among the two older age groups were substantially higher. Were these rates of increase to continue it would of course mean that the impact of demographic change and population ageing would be amplified. Table 4.4 shows the significant impact that this would have on overall increases in outpatient consultations and on those for the different age groups. Table 4.2 above projected that overall consultations would increase by 25 per cent by 2021. Table 4.4 increases this almost threefold to 58 per cent. This figure is the average growth rate with projected consultations among the youngest age group 4.2 per cent lower than the core projection whilst the rate of increase among the oldest age group almost doubles from 69 per cent to 132 per cent.

Table 4.4: Projected Increase in Outpatient Consultations By Age Group 2006-2021 Including Growth 2002-2006

	2006	2010	2015	2021
Aged <18 years	275,581	279,339	294,155	296,201
% Change on 2006		1.4%	6.7%	7.5%
Aged 18-64 years	2,053,403	2,810,558	2,927,020	3,039,419
% Change on 2006		36.9%	42.5%	48.0%
Aged 65+ years	450,311	672,010	842,684	1,043,780
% Change on 2006		54.3%	87.1%	131.8%
Total	2,779,295	3,726,473	4,063,859	4,379,401
% Change on 2006		36.2%	46.2%	57.6%

Overall however, it is unlikely that such high rates of increase will continue into the future as the waiting lists for outpatient care are reduced. However, epidemiological change may nonetheless mean that the need for consultations still increases at a higher rate than population growth alone would suggest. The first chapter of this report used a combined projection based on a number of different conditions to suggest that the 'need' for care as measured by the incidence of these conditions would increase by around 12 per cent, with marginally higher rates for men compared to women.

4.8 Projecting Public Outpatient Consultations by Hospital Network

The core national demographic projection provides a picture of the average change across the country but as the first chapter to this report showed, demographic change varies considerably across Ireland. This will lead to different patterns across the country in terms of the demand for health care, including outpatient appointments. However, projecting the impact of regional demographic trends on outpatient care is complicated by the fact that a high proportion of outpatient consultations are carried out in hospitals which are not in the hospital network area in which the patient lives. This is especially true in the old Eastern Region Health Authority Area, essentially the large Dublin hospitals, where 48 per cent of total outpatient consultations are with patients from outside of the region. The proportion in other regions is not as large, although 'out of region' consultations in the old Western Health Board make up 42 per cent of the total work load. This complex pattern of referral stems from the fact that not all specialities are available in every region or hospital network and so patients must be referred to consultants in other regions, quite often in Dublin hospitals.

Since patients are referred for outpatient appointments outside of their own region we cannot simply inflate current outpatient utilisation within a specific geographical area by the demographic projections for that area (as individuals from outside that area may be travelling in for treatment). This presents a problem as no data are available on the patterns of referral for outpatient services. However, patterns of referral are available for inpatient care and these have been published in a recent PA report (PA Consulting Group, 2007b, p.84). It is very likely that the pattern of outpatient referral is close to that for elective referral for inpatient procedures and treatment since the same hospital consultants will be involved in both processes. What is more uncertain, however, is the extent to which inter-hospital transfers, which are also part of the referral pattern for inpatient services, would not be reflective of the pattern of outpatient referrals. Given the relatively small number of inter-hospital transfers it is nonetheless likely that the pattern of inpatient referral is sufficiently similar that it can be used as a method for disaggregating the impact of demographic change.

Table 4.5: Current Inpatient Referral Pattern from CSO Regional Authority Areas to HSE Hospital Networks (Row Percentages)

Area of Residence	Dublin Midlands	Dublin North East	Dublin South	Mid-Western	North-Eastern	South Eastern	South-ern	West/ North-West	Non-Acute
Border	1.99	7.30	3.81	0.03	39.77	0.03	0.07	46.86	0.15
Dublin	20.80	42.64	34.09	0.05	1.16	0.16	0.08	0.17	0.85
Mid-East	33.06	17.95	28.39	0.06	18.65	1.09	0.10	0.20	0.51
Midland	76.13	4.67	7.43	0.50	0.96	0.64	0.09	9.39	0.19
Mid-West	2.18	1.47	2.54	81.05	0.02	3.01	5.61	3.91	0.20
South-East	3.98	2.77	6.20	0.69	0.04	80.32	5.52	0.11	0.38
South-West	0.90	0.56	0.67	0.66	0.01	0.18	92.97	0.10	3.95
West	1.52	1.75	1.70	0.19	0.07	0.02	0.09	94.57	0.09

Source: Reproduced from PA Consulting Group (2007b,) p. 84.

Table 4.5 shows the current pattern of inpatient referral from the eight regional authority areas to the eight hospital networks of the HSE. This shows that those regions close to the capital are significantly more likely to refer to hospitals in the Dublin region with the proportion falling as distance from Dublin increases. However, even the Western region still refers almost 5 per cent of its patients to Dublin hospitals.

To apply this pattern of referral to outpatient data and project the impact of demographic change we first transformed the data produced by the demographic projection into CSO regional authorities. The data on outpatient consultations from the National Hospitals Office were then grouped into hospital networks. The population projection by regional authority by year were then distributed across the hospital networks in the proportions set out in Table 4.5. The increase in the populations serviced by each of the hospital networks was then used as an inflator for the volume of outpatient consultations in each hospital network in 2006.

Figure 4.1: Projected Increase in Outpatient Consultations By Hospital Network 2006-2021

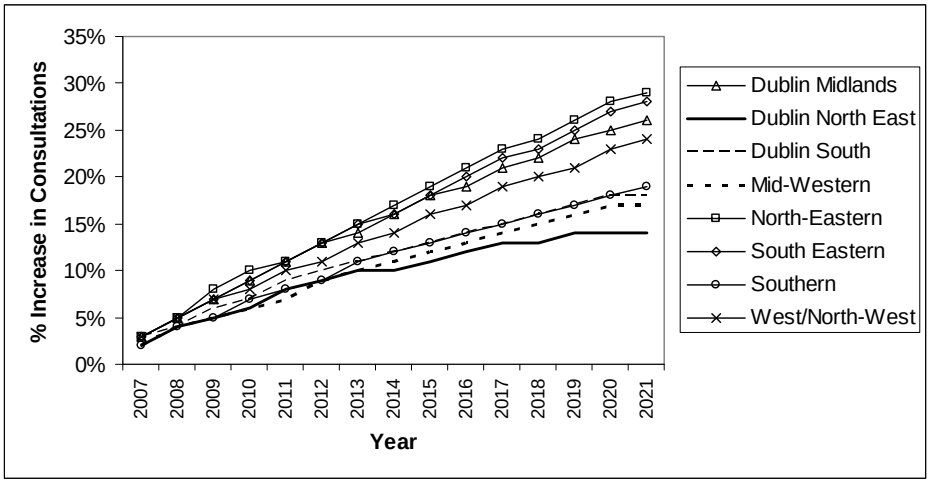

Figure 4.1 shows how the volume of outpatient consultations across hospital networks is projected to increase as a result of changing demographic patterns alone between 2006 and 2021. Table 4.6 gives the actual volume of outpatient consultations projected to occur and Table 4.7 the proportionate increases these imply. Figure 4.1 graphs the complete set of increases projected to occur and shows that volumes of consultations are projected to increase substantially across all hospital networks between 2006 and 2021. However, rates of increase are projected to differ substantially. The North Eastern and South Eastern networks are projected to experience the highest levels of growth at 29 per cent and 28 per cent respectively by 2021. At the other end of the scale the Dublin North-East and Mid-Western networks are projected to experience the lowest levels of growth at 14 and 17 per cent respectively.

Table 4.6: Projected Increase in Outpatient Consultations By Hospital Network 2006-2021

	2006	2010	2015	2021
Dublin Midlands	513,767	560,273	604,318	647,898
Dublin North East	451,723	480,778	502,148	516,207
Dublin South	489,792	525,494	554,630	577,949
Mid-Western	153,048	162,406	171,146	179,713
North-Eastern	191,497	209,620	227,753	247,246
South Eastern	260,488	283,691	307,522	333,345
Southern	324,909	346,891	366,935	386,172
West/North-West	394,071	426,012	456,117	487,713
Total	2,779,295	2,995,165	3,190,569	3,376,242

Table 4.7: Projected % Increase in Outpatient Consultations By Hospital Network 2006-2021

	2007	2010	2015	2021
	%	%	%	%
Dublin Midlands	2.9	9.1	17.6	26.1
Dublin North East	2.3	6.4	11.2	14.3
Dublin South	2.5	7.3	13.2	18.0
Mid-Western	1.9	6.1	11.8	17.4
North-Eastern	2.9	9.5	18.9	29.1
South Eastern	2.7	8.9	18.1	28.0
Southern	2.2	6.8	12.9	18.9
West/North-West	2.6	8.1	15.7	23.8
Total	2.5	7.8	14.8	21.5

4.9 Summary and Conclusions

This chapter has combined the analysis of patterns of outpatient care set out in the first report of this project with the demographic projections of the second report. Population change in Ireland for the period to 2021 is projected to be substantial with the overall population projected to increase by just over a fifth. At the same time the age composition of the population will also change substantially. Although the absolute number of those aged less than 18 years is projected to increase (by 12 per cent), this rate of growth will be far outstripped by that among older age groups and particularly the oldest old (85+). Although the oldest age groups are a small proportion of the overall population, the rate of growth combined with the higher rate of utilisation of outpatient services means that demographic change will have a significant impact on the demand placed on outpatient services.

Fortunately, the volume of public outpatient care undertaken in Ireland has increased dramatically in recent years, rising by 44 per cent between 2001 and 2006. Although there was some population growth over this period, the rate of increase in consultations stems largely from the substantial growth in the supply of services available. The number of both consultant and non-consultant doctors in service expanded significantly over this period, as did the number and size of outpatient clinics. Although it is difficult to measure whether these changes have had an impact on the level of unmet need for outpatient care, it is likely that the waiting times for care have improved in recent years and that the growth in supply has

peaked or will peak in the relatively near future (if only because of budget constraints).

Analyses in this chapter project that demographic change alone will require an increase in the requirement for outpatient consultations of 16 per cent by 2015 and 25 per cent by 2021. If epidemiological forecasts are correct these figures could rise to 46 per cent and 58 per cent. These are very substantial figures, even without the poor epidemiological outlook and would require a substantial extra investment in services. Disaggregated analyses suggest that these national estimates would need to be altered substantially across hospital networks where growth forecasts between 2006 and 2021 vary between 14 per cent and 29 per cent.

These growth requirements into the future assume that the current supply of services is in rough equilibrium with the demand, or 'need' for services. At this point it is difficult to assess the extent to which this is true as official figures are not available. If the growth in services in recent years has cleared the existing unmet need or continues to decrease the queuing times then it may be that the existing supply of services will not need to expand by the proportion stated above. On the other hand, if levels of unmet need are not being reduced, or are being reduced more slowly than population and epidemiological change, then service levels will need to be expanded. Another source of uncertainty in our projections is the current and future level of private outpatient care being provided in Ireland. It is likely that the amount of private care has increased strongly over the last decade in line with the growth in health insurance as this improved access to the insured in front of those waiting in public queues. The recent downturn in Ireland's economic fortunes may mean that the prevalence of health insurance will decline and this may well force individuals back into the public system for treatment thus increasing the need for care above the estimates given in this chapter. The same effect may also occur if the stated policy of a unified public/private queue for outpatient services is actually adopted in practice in Irish hospitals. If it is, the prime reason for buying health insurance, preferential access to hospital services, will disappear and many will return to the public system.

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5. PHARMACEUTICALS

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5.1 Introduction

Prescribing of medicines is one of the most common interactions between clinicians and individual patients. In 2006 drug expenditure in Ireland was around €1.84 billion or 15 per cent of total health care expenditure, which is comparable to other European countries (Barry and Tilson, 2007). In Europe an average of about 20 per cent of public health care expenditure is spent on pharmaceuticals.[1] The new EU Member States tend to allocate a greater share of their health care budget to the purchase of pharmaceuticals than the EU-15 Member States. The majority of pharmaceutical expenditure (85 per cent) occurs in primary care. The General Medical Services (GMS) Scheme is the largest of the Community Drug Schemes (CDS) and it covers approximately 29 per cent of the population and accounts for nearly three-quarters of publicly funded prescriptions. Those who are eligible for the GMS scheme (i.e. medical card holders) are entitled to receive a free general medical service including prescription medicines and appliances provided through community pharmacies. At the time of the analysis (September 2008) medical cards were available to all those over 70 years of age (this entitlement was introduced in July 2001) as well as those on low incomes. A new income threshold for eligibility for medical cards for people aged 70 years and over was introduced in January 2009 but these reforms are not included in the current analysis. The high threshold for the means test of over 70s (€700 per week) means that only a small proportion of existing medical card holders were effected by the change and so its impact on our analyses here is negligible.

The other categories receiving medicines for free or on a subsidised basis are those with Long Term illnesses (LTI) and those whose drug costs exceed specified limits in the Drug Payments (DP) scheme. Irish residents who are not entitled to a medical card are eligible for the DP scheme. Under the DP scheme no individual or family member is required to pay more than €100 per month for approved prescribed medicines. Eligibility in relation to the various community schemes has important implications for likely future costs.

All three schemes cover approximately 2.9 million (67.4 per cent) of the population in Ireland. The HSE-PCRS reimburses all the costs associated with dispensing of medicines under the GMS and LTI schemes. However, HSE expenditure data does not generally incorporate information on prescriptions that do not give rise to a claim on the community drug

[1] PPRI report: http://ppri.oebig.at/Downloads/Publications/PPRI_Report_final.pdf)

schemes. An exception is data relating to drugs for DPS cardholders below the reimbursement threshold, where the private co-payment forms a base (€85 up to end-2007 and €90 up to end-2008, now €100) for reimbursement. The total of these co-payments and HSE reimbursements are reported in Primary Care Reimbursement Service (PCRS) Annual Reports as the gross cost of the DPS, with reimbursements as the net cost. In 2006, the total gross cost was €443 million and the net cost was €283 million; the difference of €160 million (36 per cent) represents private payments for drugs to pharmacists, below the reimbursement threshold, which are not reimbursed by HSE.

5.2 An Overview of Current Prescribing and Recent Trends

Approximately 55 million prescription items were paid for by the Primary Care Reimbursement Service in 2006 and more than 60 million items in 2007. This represents an increase of over 5.6 million on 2006. The General Medical Services (GMS) scheme (medical card scheme) accounted for 40.6 million prescription items in 2006 i.e. 74 per cent of all items prescribed that year. There were 11.9 million prescriptions items issued under the Drug Payment (DP) scheme and 2.2 million items under the Long Term Illness (LTI) scheme. These three drug schemes accounted for 99 per cent of all prescriptions issued under the Community Drugs Schemes in 2006. Increasingly newer biological agents are being prescribed for a wide range of indications under the High Technology Drug scheme and this is likely to have an effect on future prescribing trends and the funding required. Due to the limited availability of data on the High Technology Drugs scheme at present, we were not able to specifically investigate use in the current projections. However, we have some recent data to suggest that the numbers of items (248,641 in 2006 to 282,273 in 2007, 13.5 per cent increase) and costs (€168 million in 2006 to €199 million in 2007, 18.5 per cent) are increasing rapidly.

Approximately 85 per cent of total drug expenditure is through the Community Drugs Schemes. Total expenditure was €1,340 million in 2006. Table 5.1 gives the percentage distribution across these community drug schemes in 2006.

Table 5.1: Eligibility, Proportion of Prescription Items and Payment to Pharmacies for Medicines Under the Community Drug Schemes in 2006

Scheme	% Population	% Prescriptions	% Expenditure
General Medical Services (GMS)	28.9	73.4	60.0
Drugs Payment (DP)	36.0	21.5	18.0
Long Term Illness (LTI)	2.5	3.9	7.4
High Technology Drug (HTD) (includes patient care fee paid to pharmacies)*	-	0.46	14.0

Taken from the 2006 HSE-PCRS Annual Report (3).
*In addition the payment to wholesalers under the HTD scheme was €207.25 million.

The impact of demographic change is central to this report. The first chapter in this report showed that growth in the overall size of the population will be an important determinant of health demand to 2021. It also showed that population ageing will also be important, even though the extent of change on this dimension is not as pronounced as in other countries. Nonetheless, it is important to examine the manner in which pharmaceutical use is related to sex and age. Figures 5.1a and 5.1b show the relationship between age and sex on the average number of items and ingredient costs at the level of the individual. Figure 5.1a shows that the number of prescription items increases strongly with age after a brief fall after early childhood and again between the ages of 70 and 74 years. Levels of prescribing are slightly higher for women compared to men. At each age after 15 years women are prescribed a higher number of items than men. Similarly, average costs of medicines also increase with age. This is not surprising as older age groups are prescribed more items, but it is also true that older groups are prescribed more expensive medicines (Fig 5.1b). In 2004 a population based study of prescribing for chronic disease using the GMS database was conducted for all individuals aged 70 years and over. In the study population (271,518), 86 per cent of those over 70 years received a minimum of 3 drug items for a chronic condition that year. The most prevalent condition across all 8 Health Board regions was cardiovascular

Figure 5.1a: Average Items Per Patient Per Year by Age-Groups for 2006 (Baseline Year)

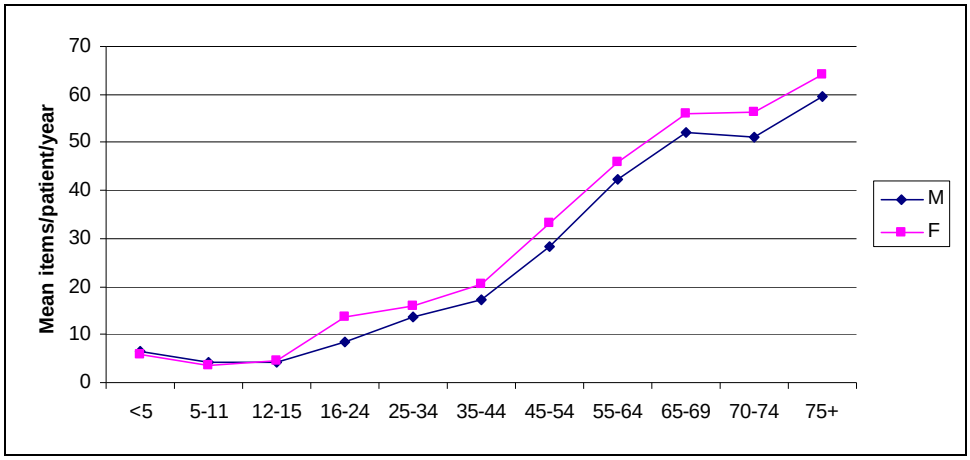
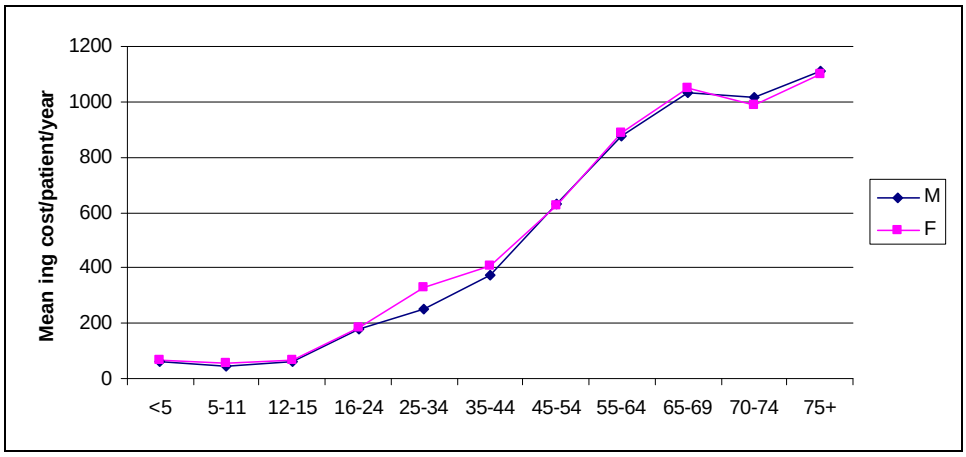


Figure 5.1b: Average Ingredient Cost Per Year by Age-Groups for 2006 (Baseline Year)



disease with over 60 per cent of the elderly population receiving regular cardiovascular medication. Over 30 per cent of persons received regular central nervous system medications and 20 to 30 per cent of patients received musculoskeletal and upper gastrointestinal medicines. Diabetes, respiratory and thyroid conditions had a prevalence of between 7 and 17 per cent (Naughton *et al.*, 2006).

5.3 Growth in Prescription Volumes and Cost

The double-digit year-on-year increase in drug expenditure under the Community Drug Schemes is amongst the highest in Europe even though Ireland ranks amongst the lowest per capita spending on pharmaceuticals (HSE, 2006). The average annual growth rate in pharmaceutical expenditure between 2000 and 2005 in the 25 EU Member States was 8.9 per cent Pharmaceutical Pricing and Reimbursement Information (PPRI) report. The growth in pharmaceutical expenditure in the new EU Member States (EU-10) was higher than the older ones (EU-25). The average annual growth rate between 2000 and 2005 in the EU-10 was 11.6 per cent compared to 7.3 per cent in the EU-15. In interpreting international trends in growth in pharmaceutical expenditure it is important to account for different starting levels as well as inflation rates, which can make a difference regarding high growth in pharmaceutical expenditure in a country.

In 2005, Ireland ranked the lowest of the EU-15 Member States in terms of total pharmaceutical expenditure per inhabitant and was only slightly higher than the average total pharmaceutical expenditure per inhabitant in the EU-10 Member States.

The main reasons for such an increase in Ireland include the prescribing of newer more expensive medications (i.e. product mix), the increased volume of prescribing (i.e. volume effect) as well as the changes which have occurred in terms of eligibility criteria. In 1997 the average cost per dispensed item under the GMS scheme was €11.20 as compared with €23.27 in 2007. In 1997 twenty million prescriptions were issued under the GMS scheme. This increased over two-fold to 44.3 million items in 2007. Demographic changes such as the overall growth in population size and a small increase in the number and proportion of older people in the population may also have contributed to this increase. Since 2000 there has been an increase in prescribing of preventative medications, for example, statins for primary and secondary prevention (Walley *et al.*, 2005; 60). Atorvastatin was the drug with highest total ingredient cost (€47.4 million) on the GMS scheme in 2007. There are two classes of drug which account for approximately 20 per cent of expenditure on the GMS scheme: the proton pump inhibitors and the statins.

5.4 Data and Methodology

GMS SCHEME -METHODS

Information on prescription items and ingredient costs from 2002-2006 were extracted from the HSE-PCRS annual statistical analysis of claims and payments reports for the GMS scheme and prescribing databases.

From 1995-2000 there had been a steady year-on-year increase in prescribing across all schemes, however, the increase was greatest in the GMS scheme from 2001-2006 as can be seen in Figures 5.2a and b.

Figure 5.2a: Ingredient Cost per Eligible GMS Patient Per Year from 1995-2006

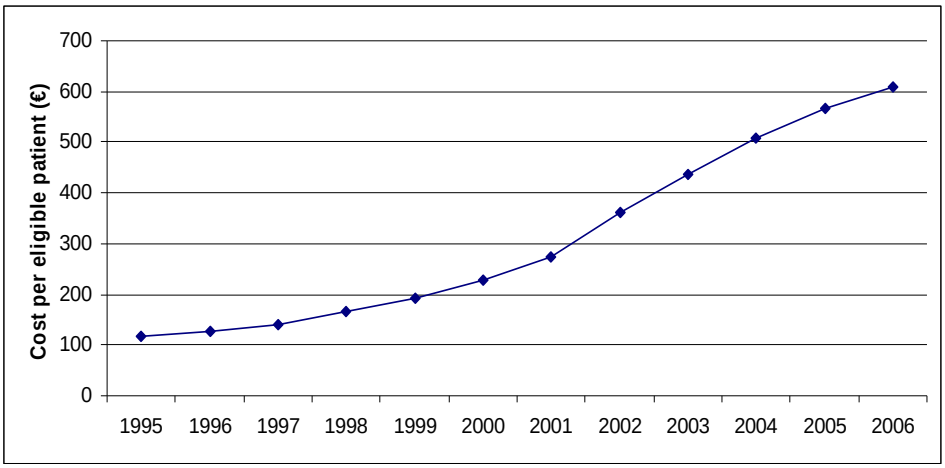
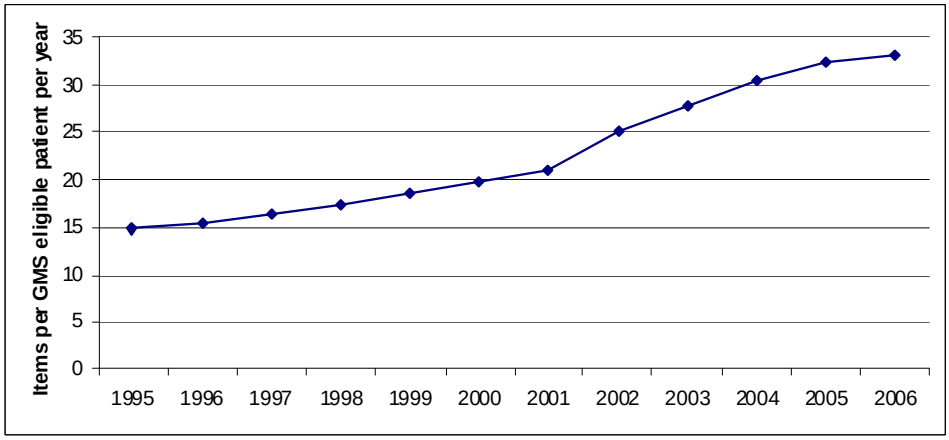


Figure 5.2b: Prescription Items per GMS Eligible Patient Per Year from 1995-2006

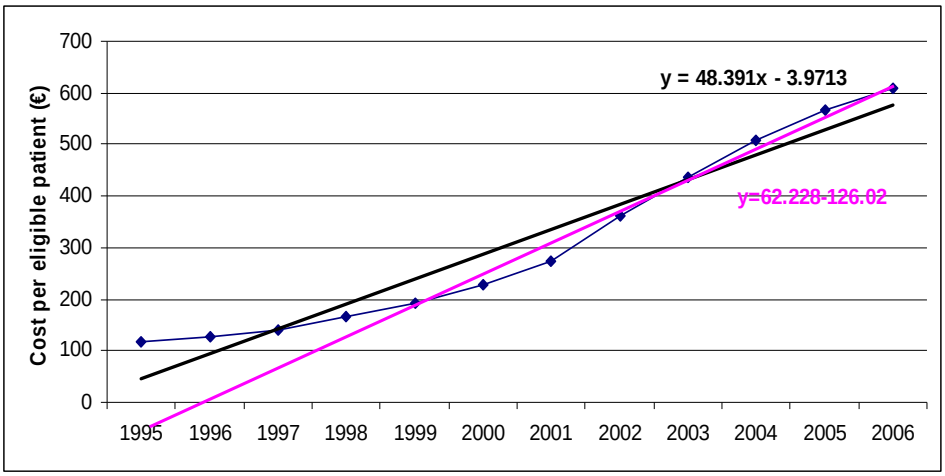


Several reasons may have contributed to this rapid increase, including the introduction in July 2001 of medical card eligibility in all those over 70 years of age and increased volume of prescribing. There have also been increases in prescribing due to newer (more expensive) products becoming available, increases in pharmaceutical marketing of medicines, and increases in evidence-based prescribing. For example, evidence on lipid lowering agents, such as statins, has been increasing over time since the publication of the first clinical trials in the early 1990s. Prescribing of these agents has increased more rapidly recently (since 2000) alongside increasing evidence and guidelines issued by bodies such as the Fourth Joint European Task Force on Prevention of Cardiovascular Disease (Fourth Joint Task Force, 2007).

Two models were adopted to predict trends in future prescribing: (i) current use (2006 rates) and (ii) regression analysis to establish trends in pharmaceutical prescribing since 1995. For the latter trend projection model the rate of growth in prescribing was significantly greater between 2002 and 2006, therefore, separate analyses were carried out and these show the differing trends in the two periods. The gradients were steeper, i.e. the rate of increase in prescribing was higher for the later period (see Figures 5.3a and 5.3b). Generally, the regression slopes for trends 1995-

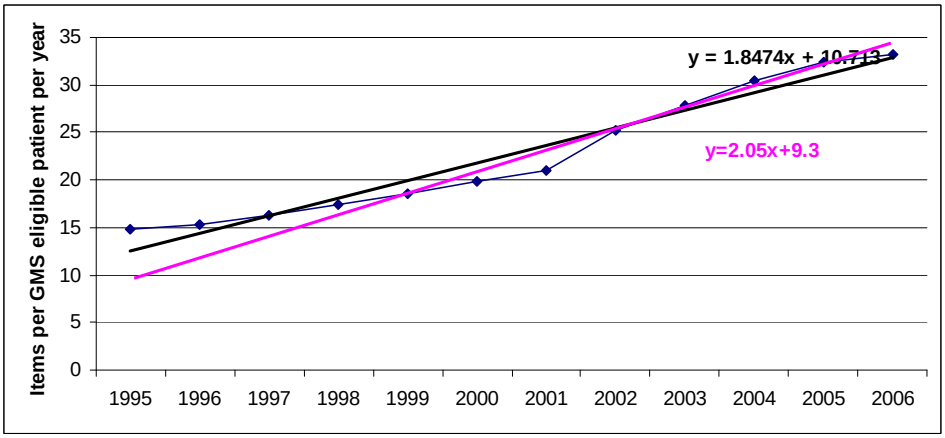
2006 were lower than 2002-2006. As these regression slopes for the period 2002-2006 are likely to over-estimate the true underlying trend, due to the more recent rapid increase, particularly in the over 70s, a downward adjustment was made to allow for this.

Figure 5.3a: Ingredient Costs Per Capita in GMS Scheme – Fitted Regression Slopes



Slope based on 2002-2006 data only. Based on all data from 1995-2006.

Figure 5.3b: Prescription Items Per GMS Eligible Patient Per Year from 1995-2006



Slope between 2002-2006 for items/pt. Based on all data from 1995-2006.

Therefore, using the 1995-2006 regression slopes is likely to under-estimate items/pt per year and costs/pt per year in those over 70 years but over-estimate in younger aged patients. Therefore, we calculated age-sex specific regression slopes from individual patient data available from 2000-2006, but adjusted these downwards by a factor of (slope in 2002-2006)/(slope 1995-2006).

DP AND LTI SCHEMES -METHODS

Two models were adopted to predict trends in future prescribing: (i) current use (2006 rates) and (ii) regression analysis to establish trends in

prescribing. For both the LTI and DP scheme age-sex specific data were not available and, therefore, we could not calculate age-sex specific regression slopes. However, data on prescribing across all ages was available and, therefore, it was possible to calculate items/pt and costs/pt per year from 2002-2006 and overall regression slopes for these. In the case of the over 70 year olds only the age-sex specific regression slopes as applied to the GMS eligible population above were applied for the DPS and LTI. In addition, it was assumed that the same proportion of patients in the GMS, DP and LTI schemes in 2006 applied beyond 2006 over the projection horizon. If there are significant changes to the eligibility for any of these schemes, this will affect the projected figures.

OTHER ISSUES

A price cut was introduced for drugs that were off-patent from March 2007. The price cut was negotiated through the Agreement between the Irish Pharmaceutical Health Care Association (IPHA) and the HSE on the pricing, reimbursement and supply of medicines for the Irish health service. A two-stepped 35 per cent price reduction (20 per cent initially followed by 15 per cent after a period of 22 months) was agreed for off-patent substitutable products. This price cut was not included in the analysis of projected costs but may have an impact on future costs. Since 1993 there has been a price freeze on medicines. Due to the price freeze in operation, recent price inflation can, therefore, be attributed to the price of new and more expensive drugs entering the market. We examined the contribution of price inflation due to new and more expensive drugs between 2000 and 2006 and found that this contributed to <5 per cent of the total cost in the GMS scheme. Therefore, no specific adjustments were made for inflationary changes over the period for calculating the regression slopes or subsequent projections.

5.5 Projected Increase In Numbers And Costs Of Prescribing To 2021

Population projections from Morgenroth (2009) were used to estimate the projected populations of eligible patients in each of the GMS, LTI and DP schemes in each year by age and sex. The age-sex specific regression slopes for prescription items/eligible population and costs/eligible population, described earlier, were then applied to the projected numbers in the GMS eligible population up until 2021 to obtain the expected numbers of items and ingredient costs. Similarly, the overall regression slopes for items and costs for the DP and LTI schemes were applied to the projected eligible populations within these two schemes to obtain the expected numbers of items and ingredients costs.

Figures 5.4a and 5.4b present the estimated projected prescription items over time by age categories based on the current use and projected trend models. Those over 75 years of age will contribute the largest increase in prescribed items, followed by those in the 55-64 and 70-74 year age categories. Trends for males and females were similar. The total number of prescription items in all three schemes (GMS, LTI and DPS) is estimated to increase to 75 million prescription items for the current use model and 110 million prescription items for the projected trend model by 2021. This is double the number of items in 2006 (54 million items). The majority of the 110 million items will be under the GMS scheme (75.7 per cent) followed by the DP (18.75 per cent) and LTI schemes (5.5 per cent). Figure 5.4c gives a sensitivity analysis around the current use and projected trend model (+/-10 per cent) and provides a direct comparison between the two

models. The current use model predicts a lower number of items than the projected trend model.

Figure 5.4a: Total Projected Prescription Items by Current Use Model – All Three Community Schemes Combined

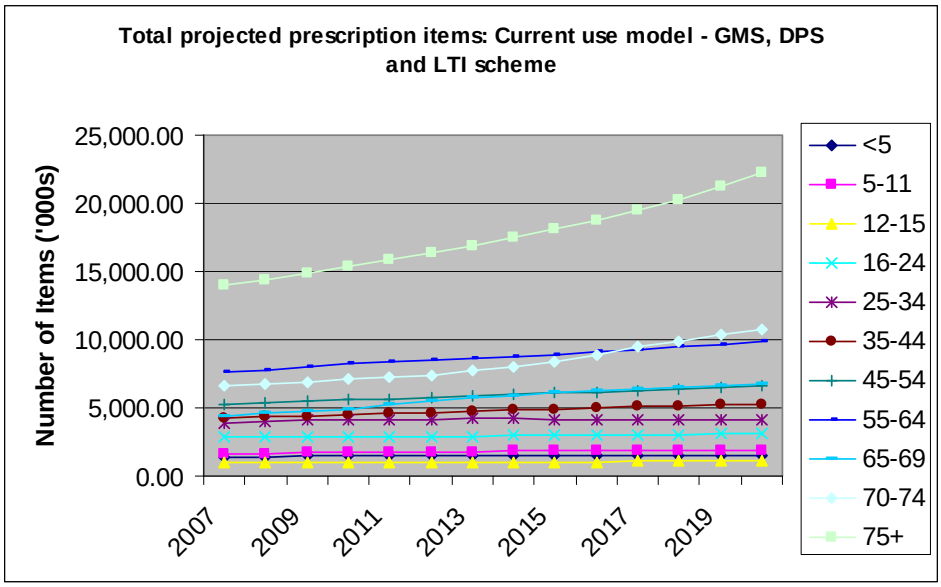


Figure 5.4b: Projected Total Prescription Items by Trend Analysis Model – All Schemes Combined by Age Group

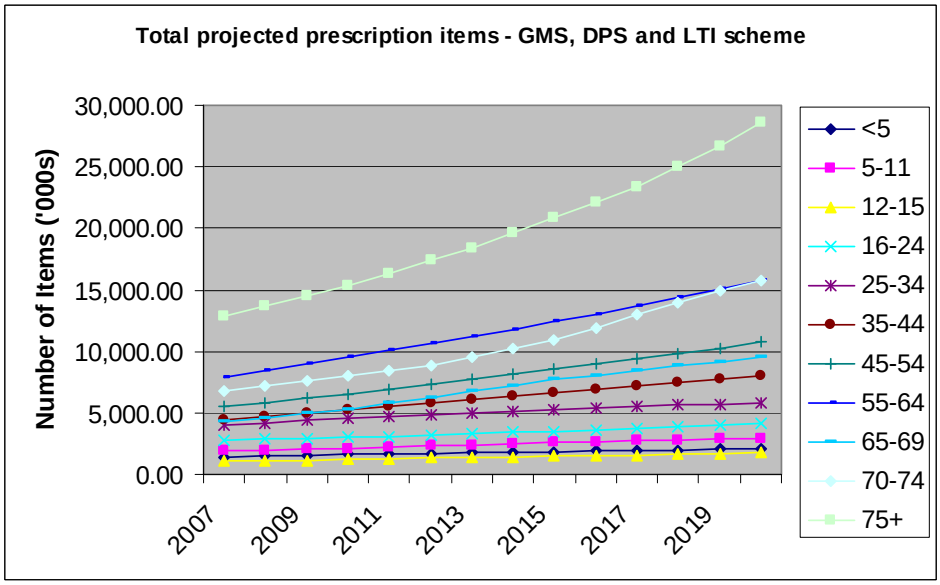


Figure 5.5 shows the differences in projected prescription items between the three schemes: GMS, LTI and DP. Although there is a slight increase in the LTI and DP schemes, this is not as great an increase as that for the GMS scheme. The change in eligibility for some over 70 year olds on the GMS scheme may actually result in a greater increase in the projections for the DP and LTI and a slightly lower increase on the GMS scheme than is reflected in these projections.

Figure 5.4c: Sensitivity Analysis Around the Current Use and Projected Trend Models for Prescription Items

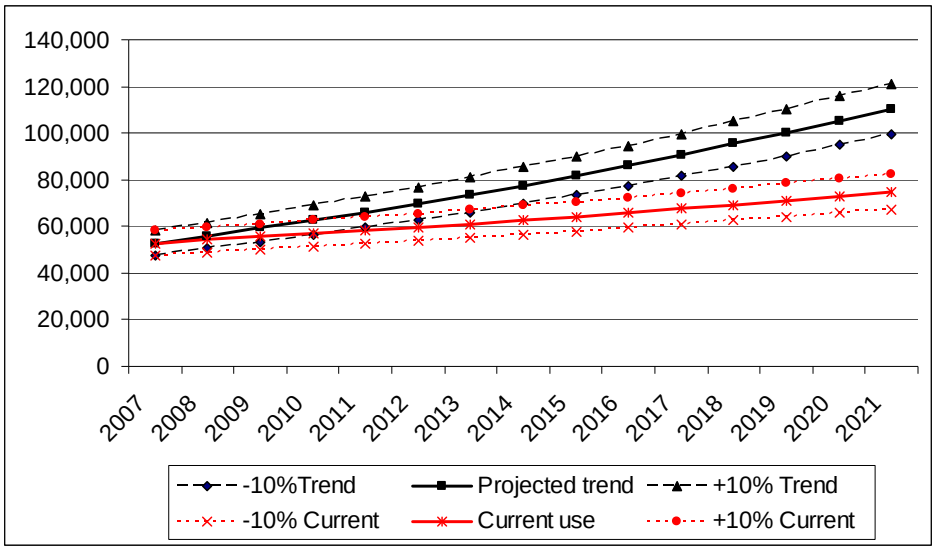
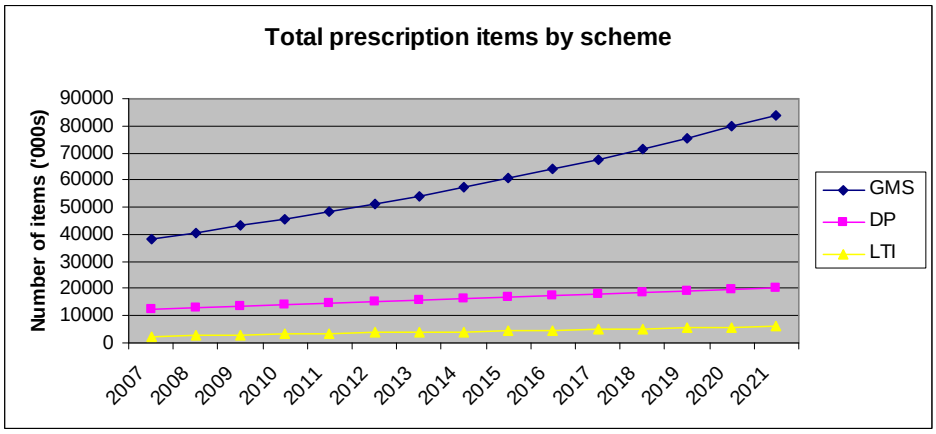


Figure 5.5: Total Projected Prescription Items Based on Trend Model by Each Community Drug Scheme



Figures 5.6a and 5.6b shows the current use and projected trend total ingredient costs associated with prescribing across all three drug schemes. By 2020 it is estimated that total ingredient cost will escalate to €1.5 billion applying the current use model and €2.4 billion applying the projected trend model across all three schemes from €1.06 billion in 2006. The oldest age category (75 years and over) will increase prescription costs by the largest amount. Applying the projected trend model the largest proportion of these projected ingredient costs in 2020 will be to the GMS scheme (€806 million, 67.2 per cent), followed by the DP (€581 million, 24.5 per cent) and LTI schemes (€197 million, 8.8 per cent). Figure 5.6c gives a sensitivity analysis around the current use and projected trend model (+/- 10 per cent) and provides a direct comparison between the two models. The current use model predicts a lower total ingredient cost than the projected trend model after 2009.

Figure 5.6a: Projected Trend Model for Total Ingredient Costs – All Schemes Combined by Age Group

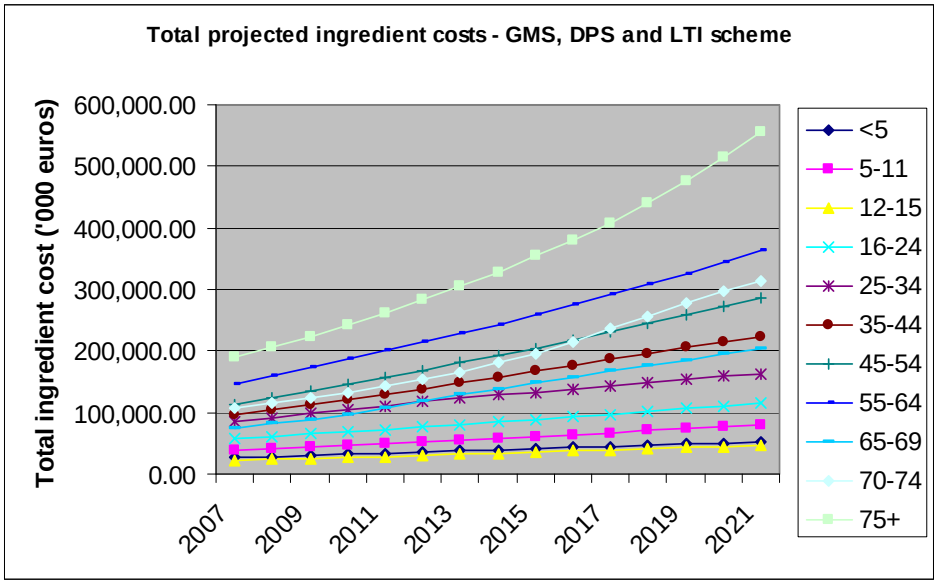


Figure 5.6b: Total Projected Ingredient Costs: Current Use Model Across Three Community Schemes

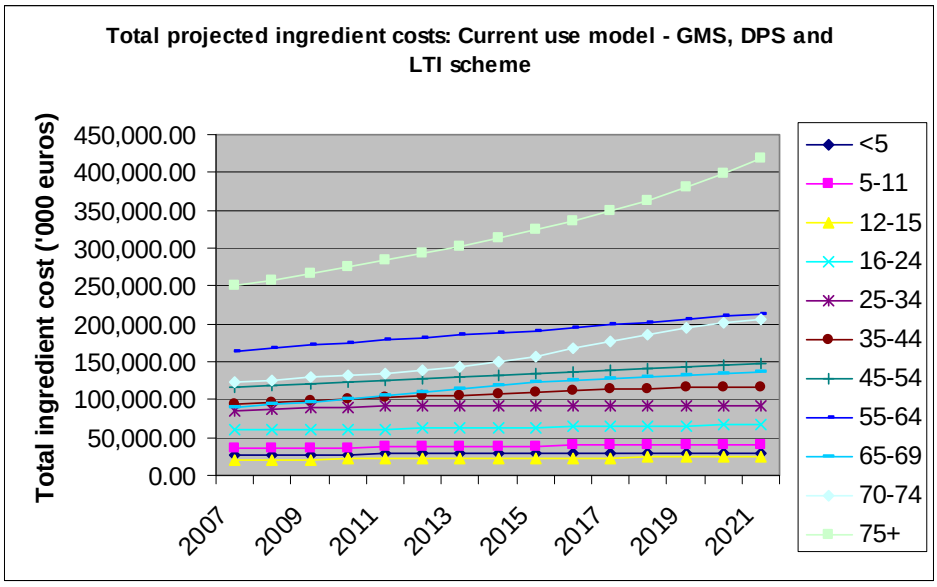
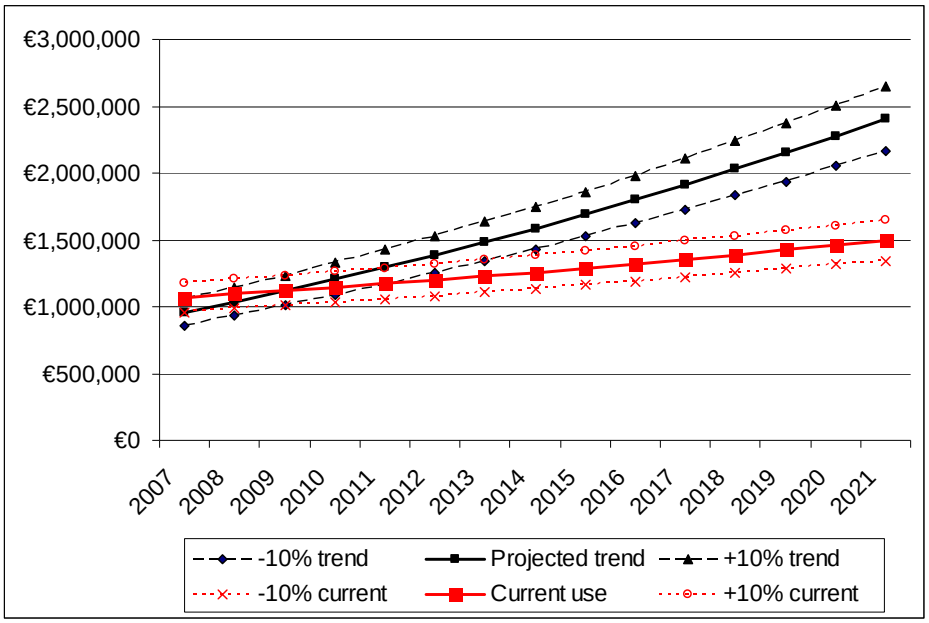


Figure 5.6c: Sensitivity Analysis Around the Current Use and Projected Trend Models for Projected Ingredient Costs



5.6 Conclusions

This chapter has examined prescribing behaviour in the Irish Primary Care Reimbursement Service and how this is likely to increase over time. Prescription items and costs are likely to continue to increase, particularly with the increasing elderly population. The estimated numbers of prescription items will rise from ~54 million items in 2006 to approximately 75-100 million in 2020 and the estimated total drug ingredient costs are likely to increase 1.4-2 fold (from €1.1 billion in 2006 to €1.5- €2.3 billion by 2020).

Prescription costs under the Primary Care Reimbursement Service increase strongly with age reaching a peak among those aged 70 years and over. Much of this extra expenditure results from the increased prevalence of chronic health conditions among older age groups such as cardiovascular disease, respiratory and thyroid conditions.

Some interesting issues arise from this analysis of public sector costs and patterns of prescribing for older people. First, the eligibility of all people over 70 years for free medical care has increased costs and the costs now all fall on the public sector. Second, since the population is growing disproportionately in the eligible age groups this growth is likely to persist.

The Agreement between the Irish Pharmaceutical Health Care Association and the HSE (IPHA-HSE Agreement) outlines the supply terms, conditions and pricing of medicines supplied to the health service in Ireland. The most recent Agreement came into effect on 1 September 2006 for a duration of 4 years.[2] A number of key changes were introduced in the 2006 Agreement which are expected to make an impact on pharmaceutical

[2] Agreement between the Irish Pharmaceutical Health Care Association and the Health Service Executive on the supply terms, conditions and prices of medicines supplied to the health services. September 2006. Available from URL: http://www.hse.ie/eng/About_the_HSE/Whos_Who/IPHA_Agreement_2006.pdf

expenditure in Ireland. First, prior to September 2006, the price of new medicines in Ireland was linked to the currency adjusted wholesale price in the UK, or the average of the wholesale price in Denmark, France, Germany, the Netherlands and the UK (whichever was lower). As all of these countries, with the exception of France, were "high priced" countries, the price of medicines in Ireland was amongst the highest in Europe. The new IPHA-HSE Agreement links the price of new medicines in nine EU Member States: Austria, Belgium, Finland, Denmark, France, Germany, the Netherlands, Spain and the UK. The inclusion of the additional four countries is expected to reduce the price of medicines in Ireland over time. Furthermore, the price to the wholesaler of any new medicine introduced to Ireland under the new Agreement is realigned to the currency adjusted average price to the wholesaler in the nominated EU Member States in which the medicine is available two and four years following commencement of the Agreement.

Second, a post-patent price cut was introduced for medicines under certain agreed conditions (Clause 6.1 IPHA-HSE Agreement). This measure was expected to achieve savings in the order of €300 million across the Community Drug Schemes and in the cost of drugs to hospitals over the duration of the Agreement. The price reduction applies to all off-patent medicines where a generic equivalent with an identical pharmaceutical form, approved by the IMB or EU, is available. A two-stepped price cut was introduced whereby the price to the wholesaler is initially reduced by 20 per cent, followed by a further 15 per cent reduction to the original price to the wholesaler 22 months later. The first 20 per cent price cuts were introduced in March 2007 and the subsequent 15 per cent cut was implemented in January 2009. This measure ensures that the HSE no longer pays a premium price for patent expired medicines.

Finally, under the terms of the 2006 IPHA-HSE Agreement, the HSE reserves the right to assess the cost-effectiveness of new and existing technologies (medicines, diagnostics and devices) that may incur a high cost or have a significant budget impact prior to reimbursement. This represents a major change in the reimbursement of pharmaceuticals in Ireland as it allows decision makers to request and use evidence of the cost-effectiveness of a new medicine in the reimbursement decision.

The next Agreement is due to be re-negotiated in 2010. Further changes to the pricing and reimbursement are likely to exert further downward pressure on drug expenditure.

For example, in Ireland the rate of generic drug utilisation is low compared with other EU Member States. In 2008, 18 per cent of prescription items were dispensed generically. This accounted for just 8 per cent of the total ingredient cost of medicines on the GMS scheme. Future policy measures aimed at increasing the volume of generic drug utilisation and reducing the price of generic medicines could also impact on the predictions of future pharmaceutical expenditure in this report.

LIMITATIONS

It is tempting to simply assume that recent trends will continue in a linear fashion to 2021. However, this is unlikely, given the potential dramatic improvements in future therapies and more effective prevention strategies which raise some uncertainties in the projected figures. Other drivers of

change such as changing expectations or changes in types of disease are likely to have an impact on the medicines being used in the future. Our calculations do not take these factors into consideration and are therefore fairly crude, and although they mainly reflect the predicted demographic changes, the assumptions made of the future behaviour of trends are very simple and may not deal adequately with strong underlying phenomena which are probably happening today and which could have impact in the future.

Only public spending has been included in the projections and no consideration is made of private expenditure. This is mainly because the data was only available from the community drug schemes and it was not possible to make any reliable estimates of expenditure beyond this. In conclusion, our projections indicate significant increases in prescribing frequency and expenditure over time, particularly within the GMS medical card scheme and in the older age groups. If the prescribing trends in the past continue, we can expect to see at least a doubling of numbers of prescription items and expenditure by 2020.

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6. LONG-TERM HEALTH AND SOCIAL CARE

Maev-Ann Wren

6.1 Introduction

This chapter forecasts demand for long-term care (LTC) in Ireland over the period 2006-2021. The basis for this forecast is the analysis of long-term care in Ireland in the first report in this series (Layte *et al.*, 2009) and the demographic projections in the second report (Morgenroth, 2009). This chapter advances the analysis in the first report in some respects: disability rate forecasts are based on analysis of disability prevalence deriving from the detailed disability volume from *Census 2006* and the first report of the National Disability Survey (CSO, 2008); and the potential effect on long-term care demand of policy developments in acute hospital care is discussed in light of international experience. The majority of recipients of LTC in institutions in Ireland are aged 65 years and over and require care because of disabilities associated with ageing. This chapter forecasts the demand for care by such older people rather than demand for care for younger people with disabilities.

Need for LTC is most immediately driven by population growth, developments in life expectancy, disability trends and trends in household composition. Rising expectations and supply-side factors such as greater availability of services may convert hitherto unmet need into active demand for care. Requirements for a higher standard of care may increase the cost of care and, in particular, the staffing levels required to deliver care. Developments in the acute sector, such as reduced length of stay, may translate into increased demand for long-term care. Severe disability is generally considered a reasonable proxy for the need of long-term care, thus defining and measuring disability is important in assessing LTC need (Schulz, 2004).

Long-term care is provided either at home or in institutions, including nursing homes and long-stay hospitals. As new forms of residential arrangements for older people have emerged in many OECD countries over the past 15 years, including sheltered housing options (so-called "extra care"), the OECD observes that it is increasingly difficult to distinguish home care from institutional care within countries (OECD, 2007b). On occasion long-term care is provided in acute hospitals due to the unavailability of care in appropriate long-term care institutions or the community. In the community, long-term care may be supplied by informal carers, typically family members, or by formal carers. It may be delivered publicly, privately or by the voluntary sector, with a greater or lesser degree

of state subsidy. Female labour force participation rates are critical to determining the availability of informal carers.

The interaction of factors influencing demand for and supply of long-term care is graphically represented in Figure 6.1. It is not proposed to model every factor depicted here. Population growth, disability trends and acute sector developments are the drivers of LTC demand incorporated in the forecast. Although less tangible influences on demand and supply such as potential Government policies in relation to long-term care, or developments in public health or access to health care, or wider influences such as trends in income or education levels, are not incorporated in the forecast, this depiction shows the points at which they may influence LTC demand and supply. Supply of care can be influenced by Government policy with regard to: eligibility regimes; investment in direct provision of places; public employment of community care staff; provision of care packages for private purchase; tax subsidy/direct grant aid of privately provided care; state purchase of private care; development of extra care/sheltered housing. Demand for care can be influenced by early detection and treatment of potentially disabling conditions; by public health measures to address obesity and encouraging exercise; by improved educational participation and ensuring adequacy of income in older age.

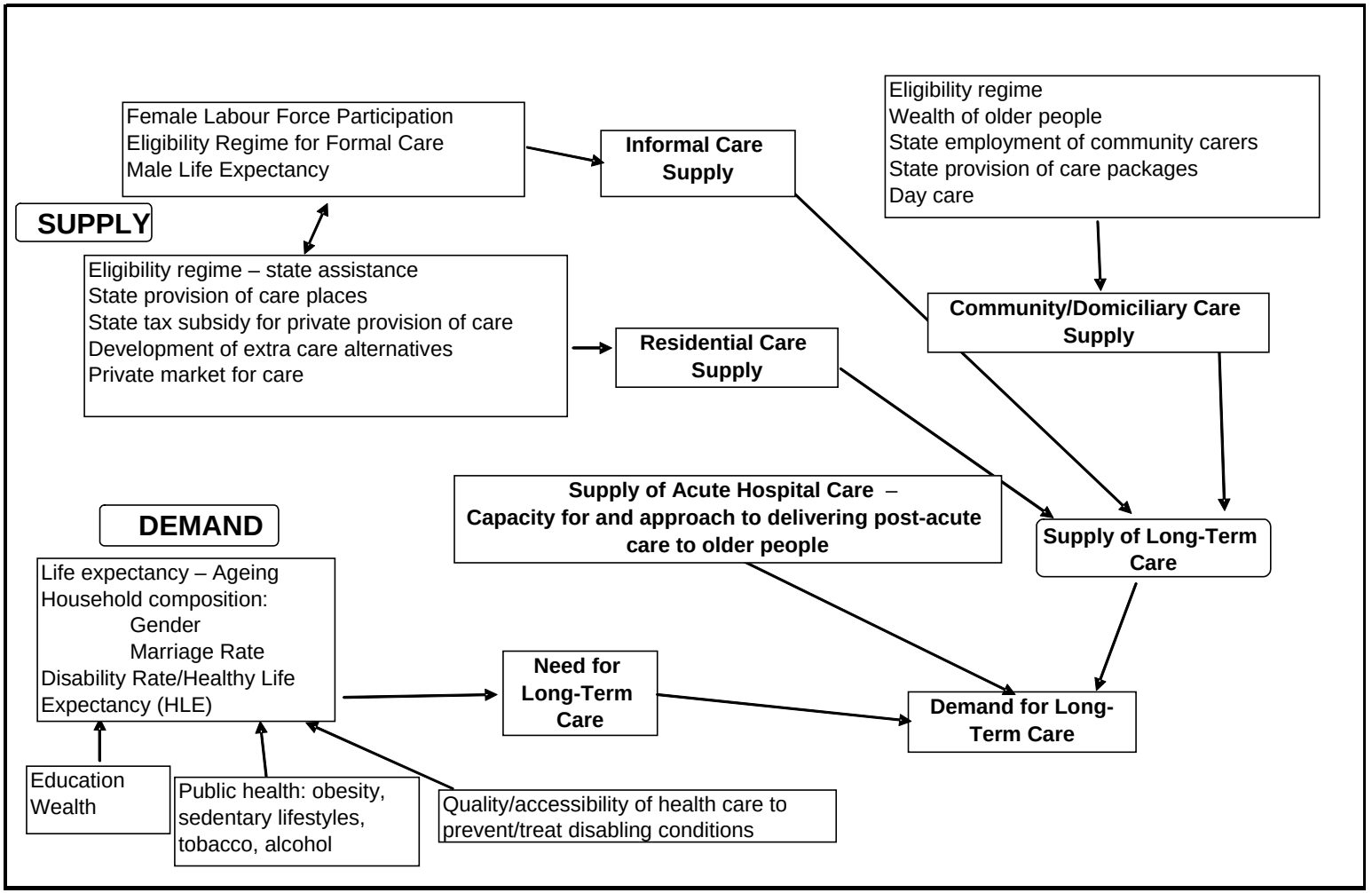
In sequence, this chapter describes: the data sources used; the forecast methodology; and relevant population and household composition forecasts. Detailed disability rate forecasts are then developed and form the basis for forecast population with severe disability, from which in turn residential LTC demand is forecast for the country as a whole and for HSE regions. The potential effect on LTC demand of proposed reductions in acute care services is analysed. The final discussion reviews a range of combinations of residential and community care that Ireland would require to match services for older people in some other European states.

6.2 Data Sources

This chapter analyses and forecasts need for LTC and the pattern in which LTC need has translated and may translate into formally supplied demand, either in institutions or the community. The measure of need is numbers of older people with severe disability. Measures of demand are numbers resident in LTC institutions, numbers in receipt of home help services and numbers experiencing delayed discharge from acute care to LTC.

The *2006 Census of Population* provides the baseline Irish population data. This chapter employs the demographic forecasts of Morgenroth (2009) for population growth by year of age and gender to 2021. Morgenroth in turn employs the mortality forecasts in Whelan (2008). *Census 2002* and *Census 2006* provide data on the evolution of disability in the years 2002-2006, while the 2006 National Disability Survey provides data on the prevalence of severe disability by age. The rate of utilisation of residential LTC in older age cohorts is derived from the *Longstay Activity Statistics Series* (LSAS) published by the Department of Health, which surveys the capacity of and population resident in public, voluntary and private long-stay institutions. Annual surveys conducted by the Irish Nursing Home Organisation supplement the LSAS to generate a more comprehensive capacity count.

Figure 6.1: Model of Demand for and Supply of Long-term Care



For the purpose of international comparison of the relationship between acute hospital care and LTC, OECD Health Data 2007b provides measures of acute and residential LTC capacity. To compare LTC intensity internationally, numbers in receipt of residential LTC, numbers of home help recipients and the average hours of home help received are employed. A new HSE database provides data on Irish home help recipients and home help hours, while Rauch (2007) is the source for such cross-country data. Female labour force participation rates are sourced from the World Bank's World Development Indicators (WDI) database.

6.3 Methodology

This chapter forecasts the need for LTC based on demographic forecasts and disability rate forecasts. This relationship can be summarised as:

LTC need = Population aged 65 years and over **X** Severe disability rate

This formula (applied across years of age for men and women) gives the forecast population with severe disabilities in any year. A number of assumptions about how disability rates might evolve are employed in alternative forecasts.

A range of forecasts for residential LTC demand is generated by first assuming that the relationship of the population with severe disabilities and the population resident in LTC institutions remains as in 2006. A further range of forecasts for residential LTC demand incorporate unmet need. Thus:

Residential LTC Demand = Residential LTC Supply + Unmet demand

Developments in acute care can substantially increase LTC care demand, at any given rate of disability prevalence. A change in the relationship between acute and long-term care may occur because of reduced acute bed capacity and/or a reduction in acute average length of stay (AVLOS). The potential impact of changing acute care provision on residential LTC demand is analysed in the light of international experience. After other factors influencing LTC demand are taken into account, there remains this influence:

LTC Demand (with reduced acute care) > LTC Demand (with current acute care)

Many people in the forecast population with severe disabilities may receive care in the community, possibly from family members, whereas others receive care in institutions or from formal caregivers. Forecast demand for residential LTC should not be solely based on an assumption that the current proportion of the population with severe disabilities that is resident in LTC institutions will prevail at the end of the forecast period, given the potential effect of changes in the supply of care in the community. While factors such as female labour force participation rates and household composition, that influence how LTC need translates into demand for formal care, are discussed but not incorporated into this forecasting model, a cross-country comparison of intensity of LTC supply is employed to discuss the varying ways in which LTC demand is met internationally and could be met in Ireland.

LTC supply = Residential LTC + Formal community care + Informal community care.

6.4 Past Utilisation Trends

Available data are insufficient to support a forecast of demand for residential or community LTC based on past trends in utilisation. Variability of returns to the Department of Health's Long-Stay Activity Statistics series (LSAS) hampers analysis. Although the *Census of Population* appears to offer an alternative data source because it records nursing home population among communal establishments, detailed examination reveals a substantial share of this population in younger age cohorts, suggesting that this category includes institutions that are not LTC facilities.

While the Department of Health's series and the Irish Nursing Home Organisation's annual surveys provide data on numbers of LTC residents and their age profiles, deriving age-specific utilisation from these surveys requires an assumption that they are representative of the population in LTC as a whole. This is assumed below in estimating older LTC residents in 2006, the baseline year for this forecast. The degree of estimation involved in generating such a count for preceding years would undermine a trend analysis. In analysing the level of community LTC provision this chapter employs a HSE database, which commenced in 2006.

The Department of Health has stated that there were 9,488 beds in public long-stay units in 2006 (Department of Health, 2006). The Department's 2006 LSAS, with a survey response rate of 80 per cent, recorded an 88.5 per cent occupancy rate in public beds, suggesting that they accommodated 8,396 residents. An Irish Nursing Homes Organisation (INHO) survey of private and voluntary homes recorded 17,909 beds with an occupancy rate of 89.4 per cent, suggesting that they accommodated some 16,000 patients. It would appear that private, public and voluntary sectors had 27,400 beds and accommodated approximately 24,400 residents in 2006. LSAS 2006 records that 92.3 per cent of residents in all categories of LTC facility combined were aged 65 years and over, giving a count of 22,500 residents aged 65 years and over and a residential LTC utilisation rate of 4.8 per cent of people aged 65 years and over. Utilisation rates range from 0.8 per cent of those aged 65 to 69 years to 33.7 per cent of people aged 95 years and over. Utilisation rates rise sharply with age but the greater numbers of LTC residents are aged 80 to 89 years rather than older. The majority of LTC residents (65 per cent) are aged 80 years and over.

Table 6.1: Age Utilisation Rates of Long-Term Care, Ireland 2006

	Aged 65 to 69 Years	Aged 70 to 74 Years	Aged 75 to 79 Years	Aged 80 to 84 Years	Aged 85 to 89 Years	Aged 90 to 94 Years	Aged 95 Years and Over	Aged 65 Years and Over
LTC Resident Population	1,098	1,976	3,562	5,612	5,807	3,538	903	22,500
Population	143,396	119,152	92,466	64,884	33,302	12,045	2,681	467,926
Utilisation Rate	0.8%	1.7%	3.9%	8.6%	17.4%	29.4%	33.7%	4.8%

Source: Age profile of residents from the Department of Health's Long-Stay Activity Statistics for 2006 applied to the estimated LTC resident population of 24,400 gives estimated LTC resident population by age cohort. Age utilisation rate is this population as a percentage of the population of that age, as in *Census 2006*. Rounded totals.

The estimated age-utilisation rate of long-term care for people aged 85 years and over in Ireland at 21 per cent is above the US and UK with rates of 14 per cent and 17 per cent. Since this is an estimate, actual utilisation may be somewhat lower. In the US and UK, public sector cost containment and the development of alternatives to institutional care have contributed to this decline (Laing and Buisson, 2007). Further factors in the US have been reduced, age-specific disability rates and increased wealth, with concomitant increased care options, among older people. The population of older people in nursing home care in the US dropped from 1.44 million in 1999 to 1.32 million in 2004 (Alecxih, 2006). The Irish utilisation rate of 4.8 per cent for people aged 65 years and over is close to the average for comparable OECD countries (Layte *et al.,* 2009).

6.5 Projecting Need for Long-Term Care

POPULATION

Morgenroth (2009) forecasts that from 2006 to 2021, the Irish population will increase by 21 per cent, the proportion aged 65 years and over from 11 per cent to 15.4 per cent and the proportions aged 80 and over and 85 and over respectively from 2.7 per cent to 4.0 per cent and 1.1 per cent to 2.1 per cent. The growth in numbers of older people is considerable, with numbers aged 85 years and over more than doubling from 48,000 to nearly 106,000 and those aged 74-84 years increasing by over half from 157,000 to 248,000. This forecast is largely independent of assumptions about growth rates and consequent immigration patterns.

Whereas Ireland has had one of the more youthful age profiles within the OECD, over the years to 2021 this is forecast to change rapidly. In 2004 on average across 30 OECD countries the proportion of population aged 65 years and over was 14.1 per cent and the proportion aged 80 years and over was 3.5 per cent (Table 6.2), which compare with projected proportions for Ireland in 2021 of 15.4 per cent and 4.0 per cent. On these forecasts, Ireland's demographics in 2021 would be similar to those of Denmark, Austria and Finland in 2004. If, rather than reducing, the pattern of immigration were to turn to sustained net emigration, these older age cohorts would constitute a greater proportion of the population as a whole, bringing Ireland's demographics closer to the mature age profile exhibited in a country such as Sweden where 17.2 per cent of the population is aged 65 years and over. Although such a turnaround in migration is not forecast to affect the numbers of people in older age cohorts requiring care over the forecast period, the change in the dependency ratio and reduced numbers in productive work would be expected to impact on the resources available for health and social care.

Table 6.2: Percentage of Population in Older Age Cohorts, OECD, 2004

	2004 Population Aged 80 and Over as % of Total Population	2004 Population Aged 65 and Over as % of Total Population
Mexico	*1.1*	5.9
Korea	*1.2*	8.7
Slovak Republic	2.3	11.6
Poland	2.5	13
Ireland	2.7	11.1
Czech Republic	2.9	14
Iceland	3.1	11.7
Luxembourg	3.1	14.2
New Zealand	3.1	12
Greece	*3.2*	*17.7*
Hungary	3.3	15.6
Australia	3.4	13
Canada	3.4	13
Netherlands	*3.4*	*13.8*
United States	*3.5*	12.4
Portugal	3.7	16.9
Finland	3.8	15.7
Belgium	*3.9*	*17*
Denmark	4.1	15
Austria	4.2	15.7
Germany	4.2	19.3
Spain	4.2	16.8
France	4.4	16.4
Japan	*4.4*	19.5
Switzerland	4.4	16.2
United Kingdom	4.4	16
Norway	4.6	14.7
Italy	*4.7*	19
Sweden	5.3	17.2
Average	3.5	14.1

Source: *OECD Health Data, 2007*. Numbers in italics for 2003 or 2002.

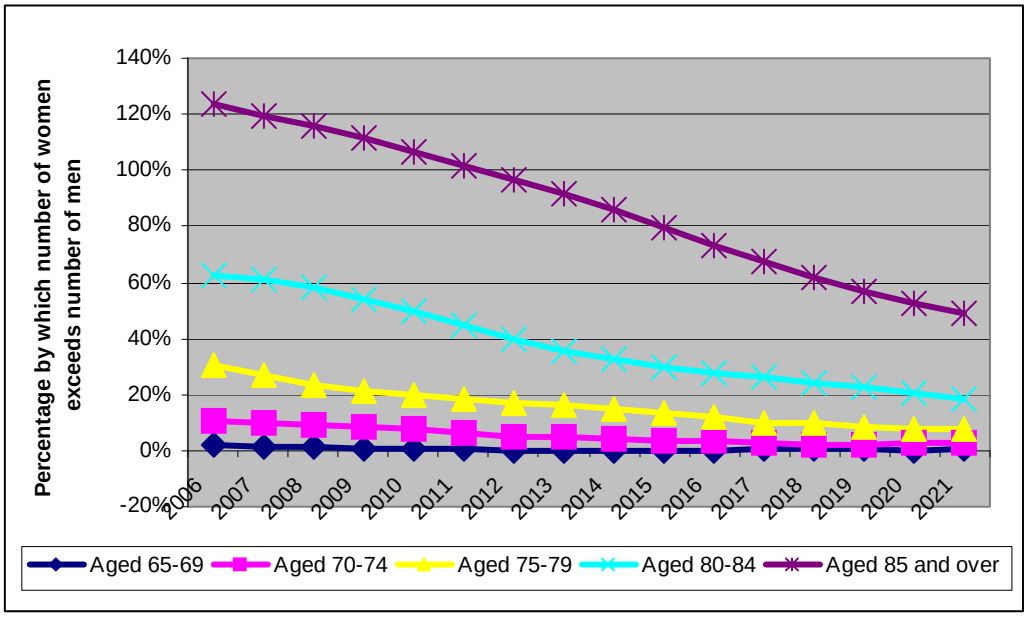
6.6 Household Composition and Informal Care Supply

Factors influencing the supply of informal care in the community include female labour force participation rates and trends in household composition. Female labour force participation can be expected to continue rising, if recent trends persist. The Irish cohort of 25-34 year old women, who in 2006 showed the highest labour force participation rate at nearly 79 per cent, will by 2026 become the cohort of 45-54 year old women, on whom the burden of unpaid care currently falls most heavily (Layte *et al.*, 2009). Although this will reduce the availability of women working in the home to provide informal care for their ageing parents, the effect of increased male life expectancy will be to increase the availability of care by spouses.

Growth in the proportion of women and men living alone at older ages over 1986-1996 stabilised in the decade to 2006 (Layte *et al.*, 2009). Based on recent trends, Morgenroth (2009) assumes that the proportion of males aged 65 years and over and living alone will remain constant, while current rates of reduction and convergence across counties of the proportion of females aged 65 and over and living alone will persist. The reduction in the proportion of older women living alone is partially explained by the reduction in the proportion of never-married among those entering older age. Additionally, increased male life expectancy improves couples' prospects of living longer lives together which supports Morgenroth's forecast of a continued reduction in the proportion of older women living alone.

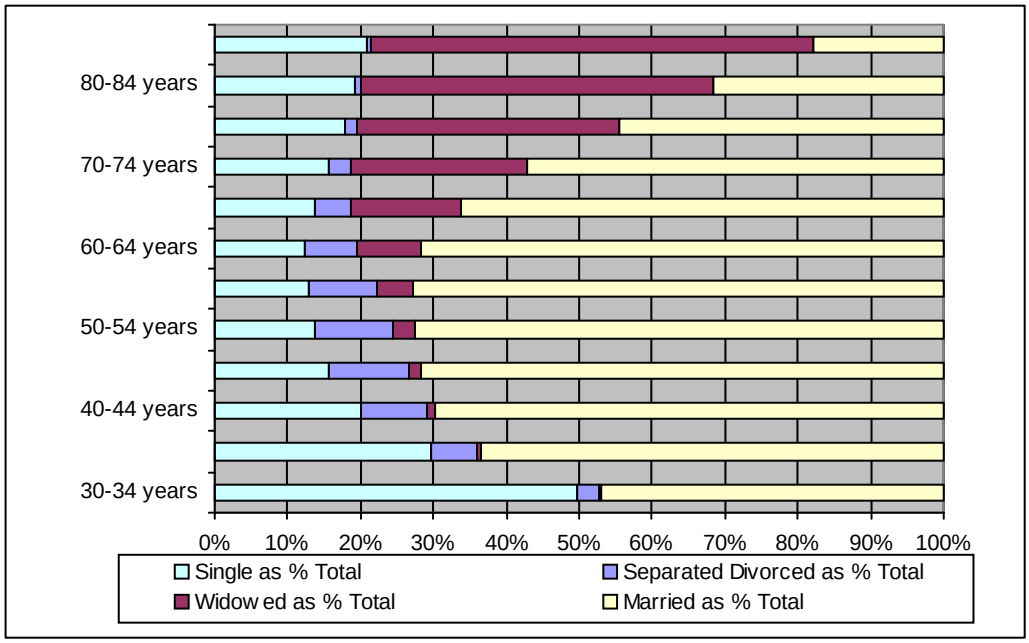
Whereas in 2006 the number of women aged 85 years and over was 124 per cent of the number of men, by 2021 the percentage difference in numbers of women over men at these ages will have declined to 49 per cent. Reductions in the difference between numbers of women over men occur across all age cohorts over 65 years (Figure 6.2). While these trends will maintain more people at home with their spouses and partners during the disabilities and illnesses of older age, offsetting these effects is the rising rate of separation and divorce (Layte *et al.*, 2009). In 2006, 24 per cent of people aged 70-74 years were widowed and 17 per cent more women survived than men. By 2021, there will be only 3 per cent more women than men in that cohort, with a consequent reduction in widowhood. In 2021 those aged 70-74 years will be the people who in 2006 were aged 55-59 years and had a separation and divorce rate of 9 per cent. While there is insufficient data to support a forecast of their rate of separation, divorce or remarriage, with fewer single people than the 70-74 year olds in 2006, and with the prospect of a much lower rate of widowhood, a higher proportion of this cohort could be expected to remain living with a partner in 2021 (Figures 6.2 and 6.3).

Figure 6.2: Forecast Percentage Difference in Surviving Women and Surviving Men at Older Ages, 2006-2021



Calculated from Morgenroth (2009).

Figure 6.3: Marital Status in the Population Aged 30 Years and Over, 2006



Source: *Census of Population 2006*.

6.7 Disability Trends

The key question for forecasting LTC need is to what degree the increased numbers of older people will experience severe disabilities. The question whether increased life expectancy will be matched by increased years lived in good health has provoked considerable international debate. In the literature, theorists suggest three possible outcomes: morbidity and disability rates remain the same at specific ages thus extended lifespan is associated with extended morbidity; poor health and disability appear at later ages but the extension of lifespan has an upper limit leading to a compression of morbidity; and both average lifespan and age of onset of poor health or disability continue to extend, leading to deferral of disability. Although the balance of opinion currently supports this third view, cross-country evidence is mixed (Fogel and Costa, 1997; Manton and Gu, 2001; Cutler, 2001; OECD, 2007). Even if disability is deferred, the critical question for LTC need is whether this deferral is of equal, greater or lesser duration than extended life expectancy, accordingly keeping constant, decreasing or increasing LTC need relative to numbers of older people. Since it is uncertain whether future reductions in the prevalence of severe disability among older people will offset completely the rising LTC demand resulting from population ageing, most studies examine the impact on health and LTC demand of alternative assumptions about the evolution of disability.

The *Censuses* of *2002* and *2006* afford the first comprehensive, longitudinal evidence on Irish disability trends and support an optimistic view of the evolution of disability. Although *Census 2006* records disability in the overall population at 9.3 per cent compared to 8.3 per cent in *Census 2002* and while there is increased overall disability prevalence in every year of age up to 71 years, prevalence is reduced at every age above 71 years. An expansion in 2006 of specified long-lasting disabling conditions is suggested as sufficient explanation for the increase in disability in the population overall (Table A1 and discussion, Appendix A). This reduced

disability rate from age 72 years and over between 2002 and 2006 is an important trend in projecting future LTC demand. This improvement is not unexpected given improved life expectancy (Morgenroth, 2009) and could be attributable to many factors: growth in income per capita; improved educational attainment; improved access to and greater investment in health and social care. For the first time from 2001 to 2008 all Irish people aged 70 years and over had access to primary care and prescribed drugs free at the point of delivery (means-testing was reintroduced in the 2009 Budget). Public current health spending per capita converged to the EU-15 average from 79 per cent in 2000 to 96 per cent in 2006 (OECD Health Data, 2008).

A common methodology employed to forecast disability rates and LTC need is to use a range of assumptions about the evolution of disability based on national and international evidence. In its forecasts, the Mercer Report (Department of Social and Family Affairs, 2002) used UK data on disability prevalence, assuming centrally that healthy life expectancy would increase in line with total life expectancy. Other projections assumed static disability prevalence; reductions in disability rates exceeding the base projection; and increased disability rates. The Report of the Interdepartmental Working Group on Long Term Care, 2006 (Department of Health and Children, 2008b), updated these projections to take account of population change, without changing Mercer's disability prevalence projections.

In this chapter the Census data are employed to forecast disability rates. Since these disability forecasts are applied to the demographic forecasts of Morgenroth (2009), underpinned by Whelan's mortality rate forecasts (Whelan, 2008), it is desirable that the methodological approaches should be compatible insofar as possible. In the Whelan methodology, mortality rates are forecast by estimating the rate of improvement by gender and age from 2002 to 2005. It is assumed that this current rate of improvement will decline over the 25 years to 2031 to a 1.5 per cent long-term average improvement rate assumed for all ages up to 90 years after 2031. No mortality improvements are assumed at ages of 100 years upwards. For each year between 2005 and 2031, the mortality declines are calculated by linear interpolation.

Since the 2002-2006 inter-censal period overlaps the 2002-2005 period, which provides the starting point for Whelan's forecasts, it is consistent to take the disability rate trend reduction over 2002-2006 as the starting point for the forecast disability rate in 2021. Table 6.3 shows the varying annual average reduction in prevalence of a range of disabilities for women and men aged 65 years and over by selected age cohorts (Appendix A, Table A2 and related discussion for more detailed analysis).

Table 6.3: Annual Average Disability Rate Reductions or Increase for Men and Women Aged 65 Years and Over, 2002-2006

%	Total with Disabilities		A Condition that Substantially Limits One or More Basic Physical Activities		Difficulty in Learning, Remembering or Concentrating		Difficulty in Dressing, Bathing or Getting Around Inside the Home		Difficulty in Going Outside the Home Alone	
Gender	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**
65+ years	-1.6	-0.7	-0.7	-1.0	-5.9	-5.8	-0.9	-1.1	-2.3	-2.9
65-84 years	-1.4	-0.4	-1.0	-1.2	-6.7	-6.1	-1.5	-1.6	-2.8	-3.4
85+ years	-3.1	-3.5	-0.8	-0.8	-5.7	-6.0	-1.0	-1.1	-2.8	-2.9

Source: Calculated from disability volumes, *Census of Population 2002* and *2006*.

To forecast LTC need, trends in conditions most associated with institutionalisation are of greatest relevance. The 2006 National Disability Survey records that conditions affecting "mobility and dexterity" and "remembering and concentrating" contributed respectively 28 per cent and 20 per cent of disabling conditions among LTC residents aged 65 years and over (Table A3, Appendix A). The evidence from the two Censuses is employed to construct a range of disability rate forecasts for 2007-2021 based on a range of assumptions about the evolution of disability. The initial assumptions are: static disability prevalence; and continued reduction in disability rates at the rates observed for cognitive disabilities/physically limiting conditions/total disabilities from 2002-2006. While the first assumption is pessimistic, the following three are optimistically based solely on recent evidence of declining disability. As assumed by Whelan in relation to the recent decline in mortality, the recent disability decline could reflect a cohort effect (i.e. the ageing of a particularly healthy generation). Further assumptions are therefore developed, employing a methodology compatible with Whelan. In the absence of long-run longitudinal evidence on Irish disability rates, it is assumed that the rate of reduction in disability rates will by 2021 revert to the base rates assumed in Department of Social and Family Affairs/Mercer (2002) (Table A4 Appendix A). In these further forecasting assumptions, the disability rate declines for 2007-2021 are calculated by linear interpolation from the annual average rates in 2002-2006 (for cognitive/physical/total disabilities) to an assumed long-run rate in 2021 equivalent to the Mercer base rate assumption.

It is necessary to determine which population with disabilities should provide a 2006 forecast baseline, differentiated by age and gender, as in the Whelan mortality forecasts. Although the National Disability Survey records severity of disability, it does not do so by single year of age and gender due to issues of sample size. An alternative baseline for severe disability prevalence in 2006 is the prevalence in *Census 2006* of conditions that substantially limit one or more physical activities, suggested as a valid alternative because age cohort and gender-specific prevalence rates of this disability closely mirror the NDS rates for severe disability (Table A5 Appendix A). Applying the seven assumptions to this baseline yields a range of age and gender-specific forecast disability rates for 2021 (Table A6 Appendix A).

The preferred forecast is based on the sixth assumption i.e. that rates of reduction in disability rates converge from the 2002-2006 trend reduction in physically limiting conditions to the Mercer base rate forecast by 2021. This is preferred because substantial physical limitation is the disability measure which is the greatest predictor of need for residential LTC, defines our baseline population and closely approximates to the NDS severe disability rate. Applying these forecast disability rates to the Morgenroth forecast population in 2021 generates a range of forecasts for the population with substantial physically limiting conditions (the proxy for severe disability) (Table 6.4; Appendix A, Tables A7-A9).

Table 6.4: Forecast Populations with Severe Disabilities in 2021 Based on Alternative Assumptions about Evolution of Disability

Assumption	Population Aged 65 and Over with Substantial Physical Limitation/ Severe Disability in 2021	
	Number	% of Over 65s
1. Static disability prevalence	164,788	20.8
2. Cognitive disability trend reduction	62,879	7.9
3. Physical disability trend reduction	141,570	17.9
4. Total disability trend reduction	131,315	16.6
5. Cognitive disability trend reduces to Mercer base rate	101,263	12.8
6. Physical disability trend reduces to Mercer base rate	147,677	18.6
7. Total disability trend reduces to Mercer base rate	141,292	17.8

6.8 Projecting Demand for Residential Long-Term Care

This forecast assumes initially that the relationship between the number of people aged 65 years and over with severe disabilities and the number of LTC residents at the same age will remain constant over the forecast period. In 2006, an estimated 94,400 people aged 65 years and over had substantial physical disabilities and 22,500 people aged 65 years and over were LTC residents. This gives a ratio of population aged 65 years and over with substantial physical disability to LTC residents aged 65 and over of 4.2:1. Applying this ratio to forecast population with severe disability, the preferred forecast demand for residential LTC for people aged 65 years and over in 2021 would be 35,200 places or 4.4 per cent of over-65s compared to 4.8 per cent in 2006 (Table 6.5). Forecast demand for residential LTC should insofar as possible take into account current unmet demand, for which a potential indicator is the incidence of delayed discharge from acute care.[1] Including a conservative estimate of delayed discharge of 400 (Tussing and Wren, 2006) increases preferred forecast demand for residential LTC places in 2021 to 35,820 or 4.5 per cent of the population aged 65 years and over (Table 6.5). This suggests a requirement for an additional 13,324 LTC places or 888 places per annum from 2007-2021 for people aged 65 years and over.

These forecasts compare with the most recent published Government forecast from the Interdepartmental Working Group on Long-Term Care of a requirement for between 600 and 1,200 additional residential LTC places per annum. The residential utilisation rate among over-65s was

[1] Often rudely referred to as "bed-blockers" in both the media and official documentation.

projected to rise to 5.4 per cent, with a recommended target rate of 4 per cent to be achieved by increasing community-based care (Department of Health and Children, 2008b). Were Morgenroth's higher population growth forecasts applied, the Working Group's projected 5.4 per cent utilisation rate would suggest a need for nearly 43,000 residential LTC places for people aged 65 years and over in 2021, an increase of 20,000 on the 2006 level, or 1,350 per annum over 15 years.

Our lower forecast of residential LTC demand is based on what might be regarded as an optimistic assumption of declining disability. Other studies have incorporated pessimistic assumptions about disability (Wanless, 2002; Department of Social and Family Affairs, 2002). Evidence of a rising obesity epidemic might support such pessimism. Additionally, if improvements in disability prevalence are related to increased investment in health care and improved access to care for older people, economic or political circumstances that reverse those improvements might be expected to reverse some of the improvement in disability prevalence**.** The forecast further assumes that factors determining demand for residential LTC remain unchanged. If high female labour force participation rates among younger women in Ireland persist as these women become older, the consequent reduction in informal care supply may increase utilisation rates for residential LTC. An OECD study has forecast greater growth in public spending on LTC for countries such as Ireland, where female labour force participation rates are projected to increase significantly for the 50-64 year old cohort, whose parents are most likely to become disabled by ageing (OECD, 2006).

The 2006 National Disability Survey recorded high numbers of people with severe disability in private households (e.g. 2,200 people aged 75 years and over with the most severe level of disability in remembering and concentrating). This suggests that informal or community care is playing an important role in keeping many people out of long-term residential care. Publication of findings from the National Disability Survey about care-givers and barriers to accessing care should facilitate analysis of how much care in private households is being supplied informally and might be vulnerable to changes in labour force participation and household composition. First Irish evidence from the smaller sample SHARE study suppprts a picture of significant undermet and unmet care needs among older people in the community (Delaney *et al.*, 2008).

Although analysis of factors influencing the mix between residential and community care is important in planning services, there may be little difference in cost between care in one setting or the other for people with severe levels of disability. While there are good quality of life reasons to favour care in the community, if a policy of de-institutionalisation is driven by cost-cutting, the evidence is that this will not improve quality of life or care. A major European study of the outcomes and costs of de-institutionalisation and community living concluded:

Table 6.5: Forecast Demand in 2021 for Residential Long-term Care for Population Aged 65 Years and Over, Assuming Factors Leading to Demand for Residential Care on 2006 Basis and Including 2006 Estimated Unmet Demand

	Disability Assumption	Pop. with Severe Disabilities	Resident in LTC Facility	Ratio Severe Disability: Res. LTC	Increase LTC Residents	Extra Places p.a.	Pop. 65+	% 65 + Res. LTC
2006		94,400	22,500	4.20:1			467,926	4.8
2021 Forecasts of alternative trends in disability	1. Static disability	164,788	39,277	4.20:1	16,777	1,118	792,067	5.0
	2. Cognitive disability trend	62,879	14,987	4.20:1	-7,513	-501	792,067	1.9
	3. Physical disability trend	141,570	33,743	4.20:1	11,243	750	792,067	4.3
	4. Total disability trend	131,315	31,299	4.20:1	8,799	587	792,067	4.0
	5. Cognitive disability/Mercer	101,263	24,136	4.20:1	1,636	109	792,067	3.0
	6. Physical disability/Mercer	147,677	35,199	4.20:1	12,699	847	792,067	4.4
	7. Total disability/Mercer	141,292	33,677	4.20:1	11,177	745	792,067	4.3
2006	Unmet need of 400 added to LTC residents in 2006	94,400	22,900	4.12:1			467,926	4.9
2021 Forecasts of alternative trends in disability - plus provision for unmet demand	1. Static disability	164,788	39,975	4.12:1	17,475	1,165	792,067	5.0
	2. Cognitive disability trend	62,879	15,253	4.12:1	-7,247	-483	792,067	1.9
	3. Physical disability trend	141,570	34,343	4.12:1	11,843	790	792,067	4.3
	4. Total disability trend	131,315	31,855	4.12:1	9,355	624	792,067	4.0
	5. Cognitive disability/Mercer	101,263	24,565	4.12:1	2,065	138	792,067	3.1
	6. Physical disability/Mercer	147,677	35,824	4.12:1	13,324	888	792,067	4.5
	7. Total disability/Mercer	141,292	34,275	4.12:1	11,775	785	792,067	4.3

> *In a good care system, the costs of supporting people with substantial disabilities are usually high, wherever those people live. Policymakers must not expect costs to be low in community settings, even if the institutional services they are intended to replace appear to be inexpensiv*e. (Mansell *et al.,* 2007.)

Changes in the eligibility framework for state supported residential care may change the mix between residential and community care, as it has in other countries. Under a new eligibility system for state support for residential long-term care, referred to as the "Fair Deal" and provided for in the Nursing Home Support Scheme Bill 2008, state financial support for long-term care will be contingent on a care needs assessment. This will focus primarily on the person's ability to carry out activities of daily living and will also take into account …*the family and community support that is available to the person…, …the medical, health and personal social services being provided to or available to the person both at the time of the carrying out of the assessment and generally… and …any other matter that affects the person's ability to care for himself or herself…* (Department of Health and Children, 2008). At the time of writing it was unclear what degree of care need or severity of disability would be required for eligibility for state support for residential or community care.

6.9 Projecting Residential LTC Demand for HSE Regions

It is not proposed to model separately for the evolution of disability for the regions. National demand for residential LTC for people aged 65 years and over is apportioned proportionately to the forecast regional share of population aged 65 years and over and 85 and over to generate regional residential LTC demand forecasts for the four HSE Regions in 2006 (Dublin/North-East, Dublin/Mid-Leinster, Southern and Western). This regional basis is chosen because the Department of Health's Long-Stay Activity Statistics provide a profile of residents and facilities in these regions, in light of which the demand forecast can be assessed. The analysis employs Morgenroth's population forecasts for the regions (Table 6.6).

Table 6.6: Forecast Population Aged 65 Years and Over and 85 Years and Over, HSE Regions 2006 and 2021

		Dublin North-East	Dublin/Mid-Leinster	Southern	Western	Total
2006	Population aged 65 and over	94,516	120,340	128,545	124,525	467,926
	% national population aged 65 and over	20.2%	25.7%	27.5%	26.6%	100%
	Population aged 85 and over	9,472	11,770	12,823	13,963	48,028
	% national population aged 85 and over	19.7%	24.5%	26.7%	29.1%	100%
2021	Population aged 65 and over	169,314	207,028	213,401	202,322	792,067
	% national population aged 65 and over	21.4%	26.1%	26.9%	25.5%	100%
	Population aged 85 and over	22,220	26,278	29,237	28,122	105,858
	% national population aged 85 and over	21.0%	24.8%	27.6%	26.6%	100%

Source: Calculated from HSE Regional forecasts supplied by Morgenroth, compatible with M2F2 forecasts in Morgenroth (2009).

Table 6.7: Profile of Residential Long-Term Care Utilisation by HSE Region, 2006

	Dublin North-East	Dublin/Mid-Leinster	Southern	Western	Total
% of Patients	19.3	25.7	27	27.9	
% of Beds	18.2	24.3	27	30.4	
% Occupancy	93.8	93.5	88.6	81.1	
% Residents 65+	93.7	83.5	95.6	96.3	
% Share all Residents 65+	19.6	23.2	28	29.1	
% Share all Residents 85+	19.4	23.5	28	29	
Number of Residents 65+*	4,414	5,229	6,302	6,555	22,500
Population aged 65+	94,516	120,340	128,545	124,525	467,926
Age Utilisation rate	4.7	4.3	4.9	5.3	

**Source*: Population share by age and region from Department of Health's Long-Stay Activity Statistics 2006 applied to 22,500 estimated LTC residents aged 65 years and over (Table 6.1; Para 6.15) to generate estimated regional LTC residents aged 65 years and over.

It is assumed in this forecast that the relationship between the population with severe disabilities and residential LTC demand is constant across the regions. However, the evidence from the Long-Stay Activity Statistics challenges this assumption. Although based on an incomplete survey, they provide the best available picture of regional variations (Table 6.7). Estimated regional utilisation rates for population aged 65 years and over vary markedly: Western (5.3 per cent); Southern (4.9 per cent); Dublin/North-East (4.7 per cent); Dublin/Mid-Leinster (4.3 per cent). While the Western Region has the greatest proportion of the national population aged 85 years and over at 29 per cent and a proportionate share of all LTC residents aged 65 years and over at 29 per cent, this region also has the lowest bed occupancy at 81.1 per cent, compared to bed occupancy levels in the Dublin regions of 94 per cent (Tables 6.6 and 6.7). Although in Dublin/Mid-Leinster and the Southern regions the share of bed capacity corresponds closely to the share of population aged 85 years and over, the Western region has a greater share of beds (30.4 per cent) than of population aged 85 years and over (29.1 per cent) while the Dublin North-East region has a smaller share of beds (18.2 per cent) than of population aged 85 years and over (19.7 per cent). This finding accords with anecdotal evidence that delayed discharge is particularly problematic in the East. Population ageing will exacerbate these pressures (Table 6.6).

When forecast national demand for residential LTC is apportioned in proportion to the regional share of population aged 65 years and over, demand is forecast to be greatest in Dublin/Mid-Leinster and lowest in the Western Region (Table 6.8). Dublin/Mid-Leinster is forecast to have 4,135 additional LTC residents in 2021, a 79 per cent increase over 15 years. If the basis for apportionment of forecast national demand for residential LTC is the regional share of population aged 85 years and over, Dublin/Mid-Leinster remains the region with the greatest forecast increase in residents at 3,664 with the Southern Region close at 3,592. LTC demand can be further adjusted to take into account the wide regional variation in occupancy rates in 2006. These adjusted forecasts assume that LTC residential occupancy rates level up to the Dublin/North-East level of 93.8

Table 6.8: Forecast Demand for Residential LTC, HSE Regions, 2021, Applying Preferred National LTC Demand Forecast

	Dublin North-East	Dublin/Mid-Leinster	Southern	Western	Total
	National LTC demand apportioned to regions proportionately to share of national population aged 65 and over				
2006 LTC residents aged 65+	4,414	5,229	6,302	6,555	22,500
2021 Forecast LTC residents aged 65+	7,658	9,364	9,652	9,151	35,824
Forecast increase residents aged 65+	3,244	4,134	3,350	2,596	13,324
Percentage increase residents aged 65+	73%	79%	53%	40%	59%
LTC occupancy rate in 2006	93.8%	93.5%	88.6%	81.1%	88.5%
2021 LTC places required if regional 2006 occupancy at Dublin/NE level	3,244	4,118	2,980	1,569	11,911
Adjusted % increase in LTC places for residents aged 65+	73%	79%	47%	24%	53%
	National LTC demand apportioned to regions proportionately to share of national population aged 85 and over				
2021 Forecast LTC residents aged 65+	7,520	8,893	9,894	9,517	35,824
Forecast increase residents aged 65+	3,106	3,664	3,592	2,962	13,324
Percentage increase residents aged 65+	70%	70%	57%	45%	59%
2021 LTC places required if regional 2006 occupancy at Dublin/NE level	3,106	3,647	3,223	1,936	11,911
Adjusted % increase in LTC places for residents aged 65+	70%	70%	51%	30%	53%

Source: National demand for residential LTC, incorporating a measure of unmet need (Table 6.4), apportioned regionally according to share of forecast population aged 65 years and over, and 85 years and over, and adjusted for relative rates of occupancy.

per cent before additional places are required. The effect of this adjustment is to emphasise the relatively greater forecast demand in the two Dublin-centred regions where occupancy is already high. Dublin/North-East's need for places overtakes the Southern Region in the occupancy-adjusted scenario where LTC demand is apportioned relative to share of population aged 65 years and over (Table 6.8).

These forecasts are blind to the nature and quality of the accommodation on offer in the regions. A lower occupancy rate might reflect the inappropriateness of some accommodation to need. Rapid growth in private nursing home provision, stimulated by tax incentives, has given rise to expressions of concern about standards of care (Layte *et al.*, 2009). This comparison suggests that translating these demand forecasts into a basis for planned expansion would necessitate examination of existing capacity and the reasons underlying regional utilisation rates and more detailed examination of demographic forecasts for older age cohorts in each region. Given the desirability that residential LTC should be close to the community and family of the resident, this analysis needs to be undertaken at the local level.

6.10 Effect of Acute Care Developments on Demand for Long-Term Care

The continuum of care for people suffering the illnesses and disabilities of ageing stretches beyond residential, community, formal and informal care to care in acute hospital settings. Developments or deficiencies in one aspect of care will affect others. Comparison of care in Ireland with care in another country needs to take into account this wide spectrum of care, so that an apparent efficiency or reduction in one aspect of care is understood within the context of its effect on that country's wider health and social service provision. Developments in acute care may substantially increase LTC demand in either residential or community settings. An EU assessment of the budgetary challenges posed by ageing found that considerable differences in LTC spending levels per head reflected radically different traditions in care for older people. Where care is largely formal and in an institutional rather than community setting, this leads to high levels of public spending on long-term care. Where care is more often informal and provided by family members, some long-term care is likely to be provided through the health system, and is included in data on health care expenditure (European Commission, 2001).

The Irish Government has adopted an explicit policy of reducing resources in acute care and transferring resources to the community sector:

> *The whole purpose of health service reform is to take resources from the acute hospital sector and spend more resources in the community sector.* – Taoiseach, Brian Cowen, Dáil Debates, Leaders' Questions, May 21 2008.

This policy is informed by a detailed HSE-commissioned study of the potential for reducing acute care utilisation (PA Consulting Group, 2007a). PA Consulting Group (2007a) projects two alternative acute bed capacity requirements based on current practice or the preferred health system (PHS), which would reduce the role of the acute hospital. Continuing current practice is projected to require an increase in acute inpatient beds (in public and private hospitals) from 13,380 in 2007 to 21,563 in 2020. If the PHS were implemented, the acute inpatient bed requirement in 2020 is projected to reduce to 7,777, while beds for day procedures would increase

to 4,125 from 2,016 in 2007. PA Consulting Group (2007a) comments that the PHS …*necessitates an increase of capacity in the community*… and the need for additional LTC beds could be such that …*it is fully possible that the net result is an increase in the total number of beds in the health system*… (PA Consulting Group, 2007a: pps. 14, 17).

One method to assess the implications of the PHS is to place it in an international, comparative context. If the demographic assumptions of the PA report (which differ from this study's) are applied to the projected PHS bed requirement, Ireland's ratio of acute inpatient beds per 1,000 population reduces to 1.5 by 2020 (Table 6.9). The acute inpatient bed ratio per 1,000 people aged 65 years and over would be 10.8 in 2020, based on the projection in PA Consulting Group (2007a) that approximately 14.3 per cent of the

Table 6.9: Acute Bed Capacity, Long-Term Care Recipients and Female Labour Force Participation, in OECD Countries with Older Age Profiles, Compared to Proposed Acute Capacity for Ireland in 2020

	2005 Pop Aged 65 and Over Per Cent	2005 Acute Inpat. Beds/ 1,000 pop.	2005 Acute Inpat. Beds/ 1,000 pop. Aged 65+	Female Labour Force Participation % 1990	Female Labour Force Participation % 2004	2004 Pop. Aged 65+ in Res. LTC %	2004 Pop. 65+ Formal LTC at Home %	2004 Pop. Aged 65+ any LTC %
Czech Rep	14.0	5.7	40.6	61	51	*4.9*	*8.2*	*13.1*
Luxembourg	14.3	5.2	36.2	34	45	3.9	4.5	8.4
Norway	14.7	3.0	20.6	57	62	*5.8*	*17.4*	*23.2*
Denmark	15.1	*3.1*	*20.7*	62	60	4.4	*21.5*	*25.9*
Hungary	15.7	5.5	35.1	47	43	8.0	15.1	23.1
Finland	15.9	2.9	18.3	59	56	*4.9*	*6.9*	*11.8*
UK	*16.0*	3.1	*19.9*	53	55	4.2	6.9	11.1
Switzerland	*16.2*	3.6	*23.4*	49	60	*6.6*	*9.4*	*16*
Austria	16.3	6.1	37.6	43	50	*3.6*	*19.3*	*22.9*
France	16.4	3.7	22.4	46	50	*6.3*	5.2	*11.5*
Spain	16.7	*2.6*	*15.3*	34	45	n.a.	n.a.	n.a.
Portugal	17.0	3.0	17.5	50	55	n.a.	n.a.	n.a.
Sweden	17.3	2.2	12.7	63	60	7.5	9.5	17
Germany	19.2	6.4	33.0	46	50	*3.4*	6.1	9.5
Italy	19.3	3.3	17.3	36	38	*1.5*	n.a.	n.a.
Japan	20.0	8.2	40.9	50	48	3.0	9.3	12.3
Ireland	11.2	2.8	24.9	36	50	4.8*	n.a.	n.a.
Ireland 2020: PHS* **	14.3	1.5 (2.4)**	10.8 (16.6)**					
Ireland 2020: current practice	14.3	4.3 (5.0)**	30.0 (34.9)**					

Sources: *OECD Health Data* October 2007 for bed, population and LTC data. Figures in italics are for preceding year. Countries vary in compliance with OECD definitions which can affect comparability. Germany's acute bed count includes psychiatric beds. If these were in proportion to the OECD average, Germany's true acute count would be 5.4:1,000 population. World Bank WDI database for labour force figures, Ireland sourced from CSO. *Institutional LTC is this report's estimate for Ireland 2006 since these Irish OECD data include only residents in publicly funded institutions.** Irish bed ratios in brackets for 2020 include day beds, not included in OECD data for other countries.*** Population data for 2020 as in PA Consulting Group (2007a), sourced from CSO *Regional Population Projections*, May 2005.

population would then be aged 65 years and over (compared to Morgenroth's forecast of 15 per cent in 2020 and 15.4 per cent in 2021). Table 6.9 compares these projected bed ratios with acute inpatient bed ratios for OECD countries, where people aged 65 years and over comprised 14 per cent or more of the population in 2005 (OECD, 2007a). The acute inpatient bed ratio per 1,000 population for these countries ranged from 8.2 in Japan to 2.2 in Sweden. The acute inpatient bed ratio per 1,000 people aged 65 years and over ranged from 40.9 in Japan to 12.7 in Sweden, with the UK at 19.9, France at 22.4 and Germany at 33. The projected inpatient bed count in public and private hospitals under the PHS would place Ireland at the bottom of this international range. The table shows the effect on Irish bed ratios of including day beds (figures in brackets) but, since the OECD does not collect these data, no cross-country comparison can be made.

Although the PHS incorporates assumptions about reduced bed utilisation deriving from future changes in medical practice, which might reduce bed ratios in other countries, Ireland's placing in this comparison nonetheless suggests that the PHS implies moving to the Swedish model of health care provision. Table 6.9 further compares OECD data on LTC (OECD, 2007b). Accompanying Sweden's relatively low acute bed complement is a developed LTC system, with 7.5 per cent of over 65s receiving LTC in institutions and 9.5 per cent receiving formal LTC at home. Even among countries with high levels of LTC provision, the ratios of acute care beds to population vary, suggesting a variable, country-specific relationship between acute and long-term care. Despite less aged populations than Sweden's and provision of formal LTC to higher proportions of older people, Norway and Denmark have 60 per cent more acute beds per 1,000 population aged 65 years and over, at 20.6 and 20.7 beds per 1,000 respectively compared to Sweden's 12.7. (Norway's acute bed numbers are overstated due to the inclusion of rehabilitation beds.)

In effectively emulating Sweden's model of provision, the PHS emerges as a particularly ambitious target for Irish health care. Sweden developed its LTC facilities over a period of rapid population ageing, when public investment in health care facilities exceeded other OECD countries' from 1970 to 1990. Although reduced, Sweden's investment remained above average and well above Ireland's investment in the 1990s, when other countries began a process of catch-up. In the decade from 1995, Norway was the highest investor in health care in the OECD. In the 1990s, Sweden underwent a revolution in care delivery, analogous to the revolution implicit in the PHS. The 1992 ÄDEL Reform transferred responsibility for LTC provision from county councils to municipalities. From 1993 to 2003, hospital bed numbers reduced by over 40 per cent, numbers of LTC beds in nursing homes increased steeply initially then reduced somewhat in recent years, which may reflect re-definition of some LTC facilities as sheltered housing. The transfer of many ill, older people into their care placed great strains on municipalities, significantly changed the hitherto generous access to home help services and increased informal care demands (Trydegard, 2004; Glenngård *et al.*, 2005; Rauch, 2007).

In OECD data, Swedish LTC bed capacity includes only those nursing home beds that provide medical as well as daily living services, whereas Ireland's data comprise an estimate of all nursing home beds. It is instructive nonetheless to calculate the LTC bed requirements for Ireland

in 2021 to match Sweden's rate of provision by this relatively understated measure. In 2021 Ireland would require 48,738 LTC beds to match the Swedish ratio of LTC beds to population aged 80 years and over, and 58,219 LTC beds to match Swedish capacity relative to population aged 65 years and over (Table 6.10). Since in 2006 Ireland had 27,400 LTC beds, the requirement to match Swedish LTC bed count relative to population aged 80 years and over would be an additional 21,300 LTC beds by 2021, a net addition of 1,423 beds per annum. To match Sweden's LTC bed count relative to population aged 65 and over would require 30,819 additional beds or 2,055 per annum. This compares with our preferred forecast residential LTC demand for population aged 65 years and over of 13,324 additional beds over 15 years, equivalent to 888 additional beds per annum (Table 6.5). The 60 per cent to 131 per cent increase in the requirement for additional LTC beds in the years to 2021 to match Sweden's provision illustrates the impact that the reduction in acute capacity, envisaged in the PHS, could have on residential LTC demand.

Table 6.10: Irish LTC Bed Requirement to Match Sweden's Provision

	Population 1,000s	Aged 65+ 1,000s	Aged 80+ 1,000s	LTC Beds	LTC Beds/ 1,000 Pop 65+	LTC beds/ 1,000 Pop. 80+	Residential LTC Utilisation Rate of Pop. 65+
Sweden 2004	8,994	1,548	479	113,826	73.5	237.6	7.5%
Ireland 2021	5,132.6	792.1	205.1				
Irish population 2021 as % Swedish pop. 2004	57.1%	51.2%	42.8%				
Irish LTC beds in 2021 to match Swedish LTC beds in 2004 relative to pop aged 65+				58,219	73.5		6.7%
Irish LTC beds in 2021 to match Swedish LTC beds in 2004 relative to pop aged 80+				48,738		237.6	5.5%

Source: Calculated from LTC bed data in OECD Health Data 2007. Irish population projections from Morgenroth (2009). See text for discussion of data limitations. Irish utilisation rates in 2021 assume that all additional LTC beds accommodate residents aged 65 years and over.

The PA report (PA Consulting Group, 2007a) quotes the "HSE Assessment of Need for Residential Care for Older People", 2006 (unpublished) as estimating that Ireland will require an additional 10,021 LTC beds by 2021. The scope of the PA review excluded analysing LTC bed requirements. PA Consulting Group (2007a) projects a modest additional need for non-acute beds to transfer patients from the acute to the non-acute setting. The calculations above suggest that were the PHS to achieve the envisaged reduction of some 13,800 in the requirement for acute inpatient beds in Ireland in 2020, reducing Ireland's acute inpatient bed to population ratios to a level lower than Sweden's, the compensatory expansion to achieve a Swedish level of LTC provision relative to the population of older people would be between 21,300 and 30,800 additional LTC beds compared to the 13,300 of our initial preferred forecast. Since

the majority of Irish LTC residents (65 per cent) are aged 80 years and over, the lower forecast of 21,300 beds required to match Swedish LTC beds relative to population aged 80 years and over is preferred in this scenario assuming reduced acute care provision. This would imply a residential LTC utilisation rate of 5.5 per cent[2] for over 65s in Ireland in 2021 (Table 6.10) which accords closely with the forecast 5.4 per cent rate in Department of Health and Children (2008b).

Sweden's demand for residential LTC is not solely influenced by its system of acute care. Its female labour force participation rate of 60 per cent compared to Ireland's 50 per cent in 2004 implies a relatively limited supply of informal carers. The steep increase in Irish participation rates suggests that in 2021 Ireland will face such pressures also. It would be helpful to policymakers if there were a formula relating acute care provision to LTC provision at different points on the curve of population ageing. However, Table 6.9 illustrates great variability in the ratio of acute beds to older population and in LTC provision in institutions or the community in OECD countries. An examination of these international data leads to the conclusion that they are inadequate to develop a simple cross-country relationship between acute care and LTC. Only by close interrogation of national data can any conclusion be drawn about the requisite LTC provision for a given acute capacity.

6.11 Cross-Country Comparison of Residential and Community Long-Term Care

Rauch (2007) assembled national data to analyse intensity of care provision for older people and showed that Sweden's LTC provision is not the most generous among Nordic countries or other European states. Rauch's indicator combines the proportion of population aged 65 years and over in residential LTC with a measure of the intensity of home help services (calculated from percentage covered and average hours of service). Rauch's data and the OECD data in Table 6.9 are not directly comparable because of differences in the method of data collection – Rauch includes semi-residential care. In 2006, an annual average of 46,500 people were in receipt of home help services in Ireland, averaging 4.7 hours weekly, according to the HSE's database of home help hours and recipients. This would comprise 9.9 per cent of the Irish population aged 65 years and over but, since the HSE does not record recipients' ages, this is probably an over-statement of the coverage rate for over 65s. By Rauch's measure, Denmark offers the most generous services to older people, followed by Norway, the Netherlands, France and then Sweden. Ireland, on this calculation, offers more generous coverage than Germany, at the bottom of this ranking, attributed by Rauch to its targeting only the most severely impaired, with consequent heavy demands on informal care-givers (Table 6.11). Germany has relatively low female labour force participation at 50 per cent, relatively generous acute care provision and is forecast to face heavily increased demand for formal care (Table 6.9, and *Source* note; Schulz, 2004).

[2] This estimate of 5.5 per cent results from the assumption that those older people who would otherwise be in acute care beds will need accommodation elsewhere following the implementation of the PHS. As elsewhere in this chapter, long-term care accommodation embraces a continuum of care including recuperative or assessment care.

Table 6.11: Comparison of Intensity of Long-Term Care Services in Institutions and the Community

Care type		Covered per 1,000 pop. Aged 65+			Intensity		FTE Places/ 1,000
		RC	HH	RC+HH	HH: h/week	RC+HH FTE value	RC + HH
Denmark	2004	8.0	20.8	28.8	5.9	0.7	20.3
Norway	2003	11.9	14.6	26.5	2.3	0.58	15.3
Netherlands	2003	8.5	13.9	22.4	3.5	0.6	13.4
France	2000-03	6.9	11.6	18.5	5.5	0.72	13.3
Sweden	2003	7.2	8.3	15.5	7.1	0.84	13.1
Ireland	2006	4.8	9.9	14.7	4.7	0.64	9.4
Germany	2000-03	4.9	2.8	7.7	9.6	0.99	7.6

Source: Adapted from Rauch (2007). RC = residential and semi-residential care services; HH = home help services; FTE = full-time equivalent. Irish data added.

Rauch's methodology can be applied to calculate required residential LTC places and home help coverage in Ireland to match provision in other countries (Table 6.12 and Figure 6.4). To match Sweden's provision for people aged 65 years and over, Ireland in 2021 would need to accommodate 57,000 people in LTC residences and supply an average 7 hours home help to 65,700 people – implying a doubling of home help hours. To match Norway's residential LTC provision for over 65s would require residential LTC capacity to increase fourfold. To match Denmark's more community based system would require close to a threefold increase in residential LTC provision and a fourfold increase in home help hours. The share of population aged 80 years and over in Denmark in 2004 (4.1 per cent) was close to Ireland's forecast 4.0 per cent share in 2021. While an approximation, Rauch's measure conveys the commitment to services for older people in some other countries and the varying ways in which care is provided.

Table 6.12: Percentage Increase in Service Provision for Over-65s Required for Ireland in 2021 to Match Selected Countries Provision

Care System Matched	LTC Residents	% Increase	Home Help Recipients	% Increase	Weekly Home Help Hours	% Increase
Denmark	63,368	182	164,757	254	972,065	342
Norway	94,260	319	115,647	149	265,987	21
Sweden	57,031	153	65,744	41	466,85	112
Netherlands	67,329	199	110,102	137	385,357	75
France	54,655	143	91,884	98	505,360	130
Germany	38,813	73	22,179	-52	212,916	-3
Ireland (2006)	22,500		46,500		219,819	

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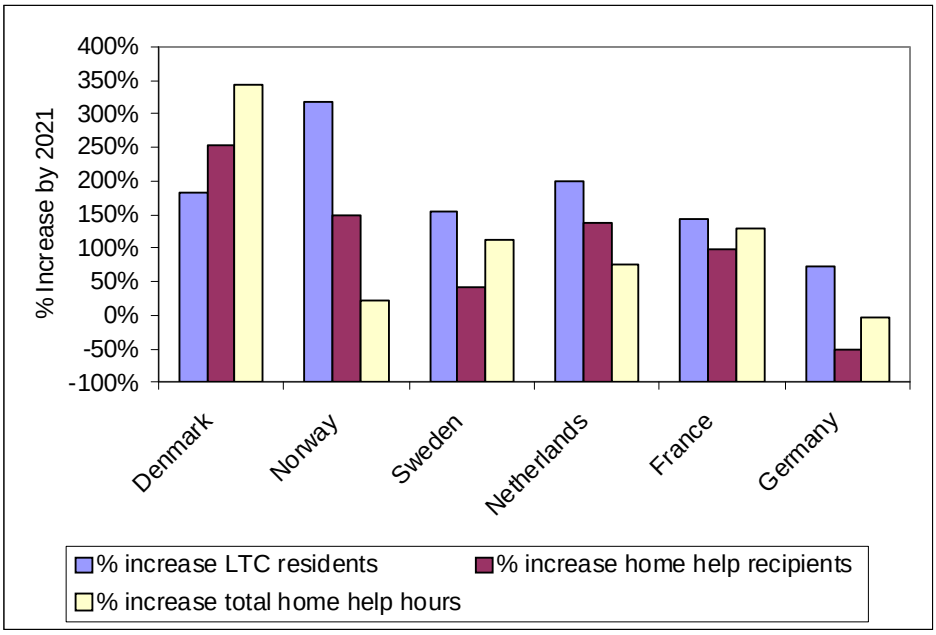
Figure 6.4: Increase in Long-Term Residential and Community Care Provision for Ireland to Match Selected Countries' Current Provision by 2021



Source: Calculated by applying the coverage rates for other countries in Table 6.11 to Ireland's forecast population in 2021. Calculated as increase required from Irish level of provision in 2006.

6.12 Conclusions

The forecast increase in numbers of people living to older ages in Ireland in 2021 and intervening years presents policymakers and Irish society with a challenge. Despite improvements in disability rates, despite older couples remaining together for longer years of life, there will be a substantial growth in the numbers of people requiring long-term care in residential facilities or the community. By 2021, capacity in care facilities will have to grow to meet this need as well as current unmet need. The initial projection models only the effects of population growth and the evolution of disability, with a conservative inclusion for unmet need. A comprehensive model would also take into account the effect of increased female labour force participation and changes in household composition. Most importantly, it should incorporate the consequences for LTC of the changes in the system of acute care delivery, envisaged by government and the HSE. Based on other countries' experience, this would substantially increase requirements for residential LTC and formal community carers. During this period of investment in capacity there is an opportunity to ensure that long-term care facilities are well-planned, close to communities in need of care, and as much as possible take the form of sheltered housing or so-called "extra care".

The initial preferred forecast suggests a requirement for an additional 13,324 residential LTC places from 2007-2021, or approximately 888 per annum, implying a residential LTC utilisation rate of 4.5 per cent of people aged 65 years and over (Forecast 1, Table 6.13). If acute care capacity is reduced and female labour force participation rates among younger women are substantially sustained as they become older, based on international experience, the additional capacity requirement in residential LTC will increase by at least two-thirds to over 21,000 places or in excess of an

additional 1,400 per annum, increasing residential LTC utilisation to 5.5 per cent of over 65s (Forecast 2, Table 6.13). To develop care in the community to the levels of other Western European states, the current level of home help provision will also have to increase substantially.

Table 6.13: Summary Forecasts

Aged 65 and Over	**2006**	**2021**
Population aged 65 and over	467,926	792,067
Severe Disability Rate %	20.2%	18.6%
Population aged 65+ with severe disabilities	94,400	147,677
Demand for residential LTC	22,500	35,824
Utilisation rate residential LTC %	4.8%	4.5%
Forecast 1: Additional residential LTC places		13,324
If Acute Care/LTC Care as in PHS/Sweden:		
Forecast 2 : Additional residential LTC places		21,300
Utilisation rate residential LTC %		5.5%

Note: This table summarises the forecast outcome on the preferred assumptions for the evolution of disability, assuming in Forecast 1 that the relationship between the population aged 65 years and over with severe disabilities and numbers in residential LTC adjusts only marginally for unmet demand and is otherwise unchanged. Forecast 2 assumes that reduction in acute care capacity as in the PHS would require compensatory increase in LTC capacity to Sweden's level relative to population aged 80 years and over.

Note: The URL for the Appendix to this Chapter is available at http://www.esri.ie/publications/search_for_a_publication/search_results/view/index.xml?id=2878

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CHAPTER 6: APPENDIX A

A1 Interpreting Evidence on the Evolution of Disability in Ireland

This Appendix discusses some of the international evidence on the evolution of disability, presents evidence for Ireland in greater detail than in the main report and provides some background data underlying the Disability Trends section in Chapter 6.

A2 International evidence

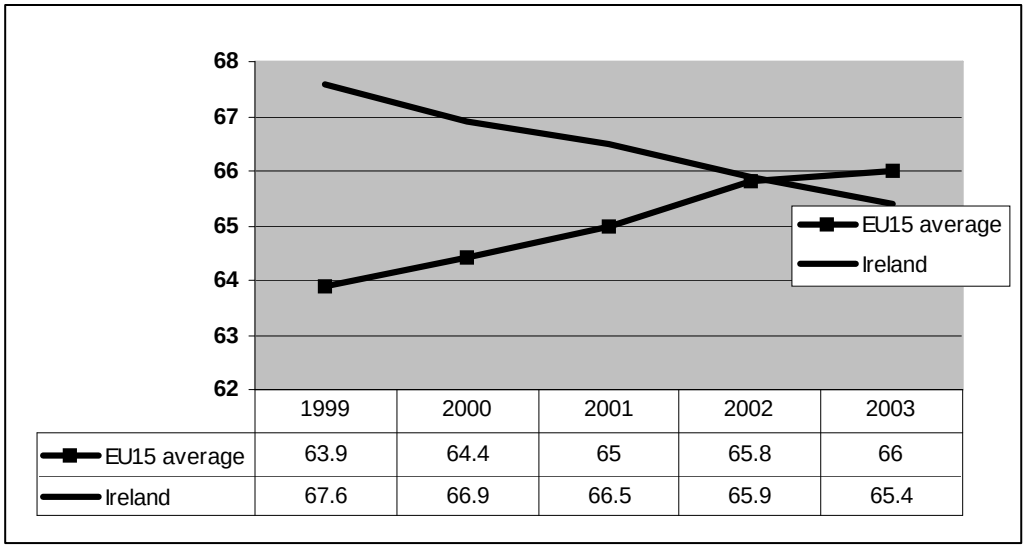
A central question for the planning of future health and social services is whether increases in life expectancy will be accompanied by concomitant increases in years lived in good health. Over long time periods, there is clear evidence of deferred disability accompanying increased life expectancy (Fogel and Costa, 1997; Manton and Gu, 2001; Cutler, 2001). Over shorter periods, cross-country comparisons have shown some divergence in trends which could have a number of causes: differing data collection methods; divergent cultural views of disability leading to differing self-assessments of health status; or concrete circumstances which make physical limitations less disabling in one culture than another (e.g. the availability of public transport, which makes inability to drive less limiting). Alternatively such cross-country differences may reflect real differences in health status deriving from the combined effect of education, income, lifestyle choices and degree of access to quality health care from before birth to old age.

OECD (2007) assessed the most recent evidence on trends in severe disability among the population aged 65 and over in 12 countries. This study found clear evidence of a decline in disability in five countries (Denmark, Finland, Italy, the Netherlands and the United States). Three countries (Belgium, Japan and Sweden) reported an increasing rate of severe disability among people aged 65 and over during the past five to ten years, and two countries (Australia, Canada) reported a stable rate. In France and the UK, data from different surveys showed different trends in disability rates among older people, making it impossible to reach any definitive conclusion on the direction of the trend.

A3 Irish Evidence

Whereas a Eurostat measure has shown apparent reductions in disability-free life expectancy in Ireland for the years 1999-2003, the first comprehensive national longitudinal data, available through Censuses 2002 and 2006, conflict with the Eurostat trend and show reduced incidence of disability among the population aged 72 years and over for the years 2002-2006. The EU indicator measuring healthy life years (HLY), also referred to as DFLE (disability-free life expectancy), is based on mortality data and disability prevalence measures. Eurostat sources its cross-country measures of disability prevalence from the European Community Household Panel (ECHP) for the years 1995-2001, with estimations for 2002-2003 based on the 1995-2001 trends. The ECHP asks the question: *Are you hampered in your daily activities by any physical or mental health problem, illness or disability*? Three responses are possible: *Yes, strongly limited; Yes, limited; No, not limited.* This Eurostat measure shows an increase on average in the EU in HLY at birth over the years 1999-2003 for both males and females. However, this measure shows HLY to be declining marginally for Irish men (63.9 years in 1999 to 63.4 years in 2003) and markedly for Irish women over this period (Figure A1). Irish HLY is shown to be improbably higher than the EU average in a period when Irish life expectancy is poorer than the EU average.

Figure A1: Eurostat Measure of Healthy Life Years at Birth – Female EU-15 Average and Ireland 1999-2003



	1999	2000	2001	2002	2003
EU15 average	63.9	64.4	65	65.8	66
Ireland	67.6	66.9	66.5	65.9	65.4

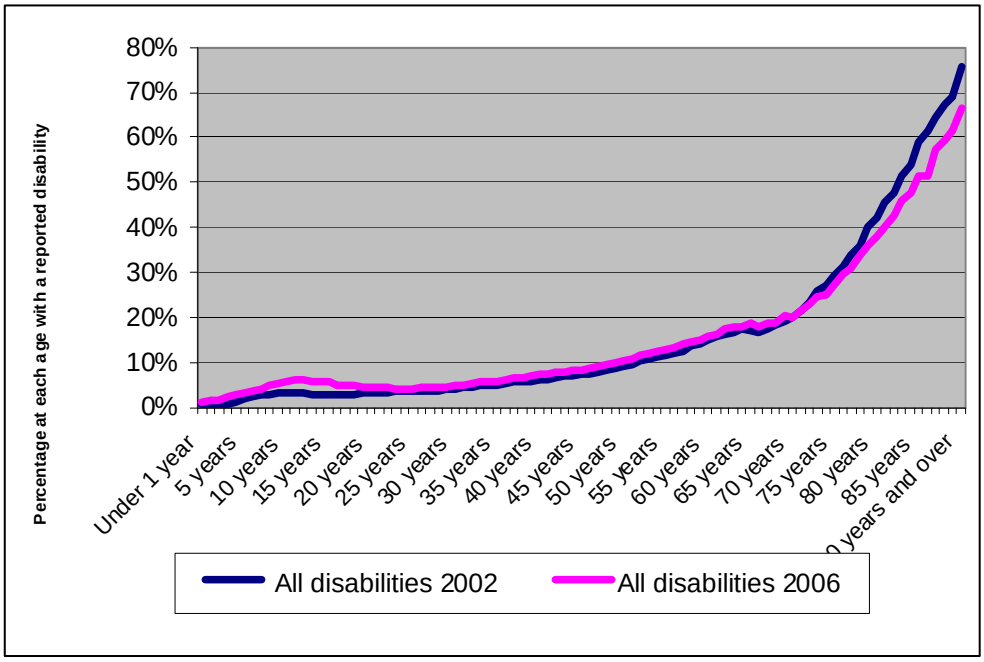
Source: Eurostat.

These findings highlight the limitations of using the ECHP as a basis for cross-country comparisons of disability prevalence. Ahn *et al.* (2004) pointed out that because health and disability status is self-reported …*this makes data fraught with problems and hard to compare among countries…using the ECHP data requires being extremely careful as to making country comparison.* Ahn *et al.*, noted that the Irish along with the Danes reported the best health status in the 1994 ECHP despite having among the worst life expectancies. Among the population aged 55-59 years, Ireland reported a 25 per cent disability rate compared to 40 per cent in Germany. For ages 65-69 years, France reported a severe disability rate of 22 per cent compared to only 10 per cent in Ireland, the UK and Spain. Such improbable differences might partly reflect cross-country differences in the proportion of the older population living in institutions who are not surveyed for the ECHP, an important omission in this context. However, in light of the magnitude of

the differences, it seems likely that differing cultural understandings of disability and expectations for activity in older age also play a role.

Given the limitations of cross-country comparisons, national data tend to be used to determine trends within countries in the evolution of disability. The *Censuses of Population* for *2002* and *2006* present a picture of reduced disability prevalence in older age (Figure A2, Table A1). Whereas disability in the overall population is recorded as 9.3 per cent in 2006 up from 8.3 per cent in 2002 and Census 2006 shows increased overall disability prevalence in every year of age up to 71 years, it shows reduced prevalence for older ages.

Figure A2: Percentage of Population with a Disability by Year of Age, 2002 and 2006



Source: *Census of Population,* Disability Volumes, *2002* and *2006*.

Increased disability prevalence at younger ages in Census 2006 is explained by an expansion in the conditions recorded. In 2002 respondents were asked in a first question about their experience of …*long-lasting conditions*… specifying those affecting sight and hearing, and physical activity. A further question enquired if any physical, mental or emotional condition lasting six months or more caused difficulties in a range of everyday activities from …*learning, remembering and concentrating*… *to going outside the home alone or working*.

In 2006 the range of long-lasting conditions specified in the first question was expanded to include: a learning or intellectual disability, a psychological or emotional condition and …*other, including any chronic illness*… The subsequent question about difficulties in everyday activities no longer stipulated that this related to a condition lasting 6 months or more but stated that anyone experiencing the long-lasting conditions described in the first question should answer this question. It too was expanded to include a general category …*participating in other activities*…. The expansion of specified long-lasting conditions could be sufficient

Table A1: Disability Prevalence 2002-2006

Age Group	Census 2002 % of Persons With a Disability %	Census 2006 % of Persons With a Disability %	Annual Average Percentage Increase/Decrease 2002-2006 %
0-4 years	0.7	1.8	26.6
5-9 years	2.7	4.2	11.7
10-14 years	2.9	5.8	18.9
15-19 years	2.8	4.9	15.0
20-24 years	3.3	4.3	6.8
25-29 years	3.7	4.4	4.4
30-34 years	4.5	5.2	3.7
35-39 years	5.4	6.3	3.9
40-44 years	6.4	7.7	4.7
45-49 years	7.9	9.0	3.3
50-54 years	10.1	11.3	2.8
55-59 years	12.7	14.0	2.5
60-64 years	16.0	17.0	1.5
65 years	16.8	18.4	2.3
66 years	16.7	17.8	1.6
67 years	17.3	18.6	1.8
68 years	18.3	18.7	0.6
69 years	19.2	20.1	1.2
70 years	19.9	20.1	0.2
71 years	21.4	21.6	0.2
72 years	23.4	22.8	-0.7
73 years	25.8	24.4	-1.4
74 years	26.9	25.0	-1.8
75 years	29.0	27.1	-1.7
76 years	31.3	29.6	-1.5
77 years	33.6	31.0	-2.0
78 years	36.1	33.6	-1.8
79 years	40.0	36.0	-2.6
80 years	42.0	37.8	-2.6
81 years	45.5	40.0	-3.2
82 years	47.7	42.7	-2.7
83 years	51.3	45.9	-2.8
84 years	53.8	47.8	-2.9
85 years	58.9	51.4	-3.3
86 years	61.3	51.5	-4.2
87 years	64.2	57.3	-2.8
88 years	67.2	59.2	-3.1
89 years	69.0	61.6	-2.8
90 years and over	75.6	66.6	-3.1
Total	8.3	9.3	3.0

Source: *Census of Population,* Disability Volumes, *2002* and *2006*.

explanation for the increase in disability recorded in the population overall and at earlier ages, in particular among children. Thus, whereas the percentage of 12-year-olds experiencing sight and hearing disabilities or conditions affecting physical activity (those questions with no change in

presentation or wording) remains constant in the two censuses at 0.6 per cent, the specification of additional conditions elicited that over 4 per cent of the age cohort experienced long-lasting learning or intellectual disabilities and 1.2 per cent had conditions in the …*other, including chronic illness*… category. The increase from 3 per cent to 6 per cent in those 12 year olds experiencing one or more disabilities between the two censuses could thus be entirely explained by the wider range of specified conditions.

Changes in the question asked do not explain the reduced prevalence of disability at higher ages in 2006. For conditions where the Census questions remain unchanged, such as impairments of sight and hearing, while there is a marginal drop in disability prevalence overall and in most younger ages, this becomes more marked as age increases. In the case of conditions that substantially limit basic physical activities, there is also an overall decline in disability. The trend is more variable than in the case of sight and hearing but the greater falls in disability prevalence are again recorded among older people. Were these unchanged questions the only two questions asked, the evidence would be of a clear decline in disability prevalence overall, and a more marked decline at older ages (Table A2).

Other measures of disability that show similar declines in age-specific prevalence, which broadly increase with greater age, are difficulty in: learning, remembering or concentrating; dressing, bathing or getting around inside the home; or going outside the home alone to shop or visit a doctor's office (Table A2). The only difference in reporting methodology for these questions is that in 2002 respondents were asked to report such difficulty if they had had …*a physical, mental or emotional condition lasting 6 months or more*…; whereas in 2006, respondents were asked to report such difficulties if they had responded 'yes' to the previous question which asked inter alia whether they had a psychological, emotional, or physically limiting condition or a chronic illness (without restriction to one lasting 6 months or more). Further evidence of reduced disability prevalence among older people is a decline in the prevalence of multiple disabilities as recorded between the two censuses.

There is a difference in the rate of decline across categories of disability, with the lowest annual average decline experienced in the prevalence of *A condition that substantially limits one or more basic physical activities*. Women aged 65 years and over experienced an annual average decline of 0.7 per cent per annum in this type of disability while men recorded a 1 per cent per annum decline. The annual average disability rate decrease is greatest for cognitive disability (*Difficulty in learning, remembering or concentrating*) with the overall 65 years and over age cohort experiencing an annual average drop in prevalence of close to 6 per cent for both women and men. The 65-74 year old cohort of women experienced a decline in the prevalence of this disability of over 7 per cent per annum over the four years to 2006.

In forecasting long-term care need, and especially the need for residential long-term care, trends in those conditions most associated with institutionalisation are those of greatest relevance. In public and voluntary long-stay institutions in Ireland the Department of Health's Long-Stay Activity Statistics record that in 2006 the largest proportion of residents required care because of chronic physical illness (34.5 per cent) with dementia (24.1 per cent) as the second largest reason for residence. Private nursing homes reported significantly more residents suffering from

dementia (29.9 per cent) than any other category of institution. A further 6.8 per cent of their residents suffered from chronic mental illness (Layte *et al.,* 2007).

Table A2: Annual Average Disability Rate Reduction or Increase for Men and Women Aged 65 and Over in the Years 2002-2006

%	Total with Disabilities		A Condition that Substantially Limits One or More Basic Physical Activities		Difficulty in Learning, Remembering or Concentrating		Difficulty in Dressing, Bathing or Getting Around Inside the Home		Difficulty in Going Outside the Home Alone	
Gender	F	M	F	M	F	M	F	M	F	M
Total	2.4	3.7	-1.5	-2.2	-2.2	1.4	-1.3	-1.4	-2.3	-1.8
65 years	2.3	2.3	-1.4	-1.5	-7.0	-4.4	-4.0	-1.6	-4.2	-3.4
66 years	1.8	1.4	-1.9	-1.9	-6.0	-6.7	-2.6	-2.0	-2.9	-3.0
67 years	2.8	0.9	-0.3	-2.2	-6.9	-4.6	-0.5	-3.5	-3.9	-6.0
68 years	0.4	0.7	-2.2	-2.4	-7.5	-5.8	-2.9	-2.1	-4.3	-3.0
69 years	0.5	1.9	-1.9	-0.5	-6.4	-6.7	-1.9	0.0	-3.3	-3.2
70 years	-0.1	0.6	-2.0	-1.4	-7.1	-8.1	-1.7	-2.1	-2.6	-4.8
71 years	-0.6	1.1	-1.1	-2.0	-7.8	-3.6	-2.5	-1.6	-2.4	-3.7
72 years	-1.0	-0.2	-1.6	-1.3	-8.4	-5.0	-2.7	-1.7	-3.7	-2.1
73 years	-1.6	-1.0	-1.5	-2.4	-6.7	-6.4	-1.6	-1.7	-2.7	-4.6
74 years	-2.0	-1.3	-2.0	-2.7	-5.9	-7.6	-1.8	-2.1	-3.7	-4.2
75 years	-2.0	-1.1	-1.9	-1.2	-9.2	-9.0	-3.2	-2.5	-4.1	-3.2
76 years	-1.9	-0.6	-1.1	-1.0	-7.8	-5.5	-2.5	-2.6	-2.6	-4.3
77 years	-2.2	-1.5	-1.3	0.1	-9.1	-7.8	-2.7	-0.2	-2.9	-2.5
78 years	-1.8	-1.6	-0.3	-1.4	-6.4	-7.8	-0.5	-1.7	-2.0	-3.8
79 years	-3.0	-1.8	-1.3	-0.3	-6.1	-6.0	-2.4	-2.6	-3.0	-3.6
80 years	-2.7	-2.4	-1.0	-1.0	-6.9	-6.7	-0.4	-1.3	-2.7	-3.2
81 years	-3.5	-2.5	-0.8	-1.3	-6.0	-6.5	-0.9	-1.6	-3.2	-3.9
82 years	-3.0	-2.3	-0.7	-0.1	-5.1	-4.6	-1.3	-0.8	-2.7	-1.6
83 years	-2.9	-2.6	0.8	0.7	-7.6	-6.0	-0.4	-0.6	-1.9	-2.9
84 years	-3.1	-2.4	-0.6	-0.4	-5.4	-2.2	-0.8	-0.9	-2.6	-2.8
85 years	-3.0	-3.9	-0.4	-1.0	-6.6	-4.4	-1.7	-1.2	-2.7	-3.5
86 years	-4.6	-3.4	-2.0	-1.9	-5.4	-7.9	-1.2	-2.4	-3.7	-3.7
87 years	-3.0	-2.2	-1.0	1.5	-4.8	-6.3	-0.9	0.6	-2.5	-0.7
88 years	-3.0	-3.0	-0.9	0.1	-5.9	-6.7	-1.0	-1.8	-3.0	-2.4
89 years	-2.4	-3.9	0.7	-2.0	-5.1	-6.8	-0.3	-4.0	-2.0	-3.3
90 years and over	-2.9	-3.8	-0.8	-0.9	-5.9	-5.4	-1.0	0.2	-2.7	-3.2

Source: Calculated from Disability Volumes, *Census of Population 2002* and *2006*. Disability data aggregated at source for age 90 years and over.

The National Disability Survey of 2006 further expanded the definition of disability and recorded a much higher national disability rate. In addition to surveying the incidence of a wider range of disabilities among a sample of those who had reported a disability in the Census, it surveyed a further sample of those who had not reported a disability. This revealed in particular that when experience of pain or breathing disabilities (such as asthma) are included among disabling conditions, this has a considerable

impact on the reported prevalence of disability. Disabilities relating to pain were the most commonly reported. The survey's more embracing definition of disability had the effect of increasing the Irish disability rate from 9.3 per cent to 18.5 per cent of the population, a rate which is closer to international experience (Central Statistics Office, 2008).

The survey also provides data on the severity of disability – an important measure in assessing need for health or social care. For the population aged 65 years and over with severe disabilities (with the effect that they have a lot of difficulty in undertaking everyday activities or cannot do them at all), close to or over 40 per cent were resident in communal establishments (nursing homes and long-term care hospitals), if their disability was in the category of: speech, remembering and concentrating, intellectual and learning, or emotional, psychological and mental health (Table A3). The National Disability Survey affords the first opportunity to compare the proportions of people at different ages and with varying levels of disability who are living in long-term care institutions and in private households. (Only residents in long-term care hospitals or long-term care sections of hospitals were interviewed in the survey i.e. patients receiving acute hospital care were excluded.)

While a disability affecting speech is the greatest predictor of LTC residency, with 53 per cent of people aged 65 years and over with such a disability residing in long-stay care, this is a relatively small grouping of long-stay residents (and could be associated with end-of-life illness and multiple disability). The disabling conditions experienced by the greatest number of long-stay residents aged 65 years and over in 2006 were those affecting …*mobility and dexterity*… (16,300) and …*remembering and concentrating*… (11,800), a finding consistent with the Department of Health's Long-Stay Activity Statistics. These two categories contributed 48 per cent of the 59,200 disabling conditions among long-stay residents aged 65 years and over (many residents have multiple conditions) (Table A3). In the older population overall respectively 69,700 and 22,600 people aged 65 years and over experienced a lot of difficulty in everyday activities or were unable to do them at all because of either such physical or cognitive impairments. In these groupings 20.9 per cent of people with high levels of physical restriction and 40.3 per cent with high levels of cognitive impairment resided in long-stay institutions. Although 30,100 people experienced pain as a disabling condition at these two highest levels of severity, only 6.6 per cent of these people were resident in LTC.

A4 Applying the Evidence on the Evolution of Disability to Forecasting

The evidence from the two Censuses is employed to construct a range of disability rate forecasts for 2007-2021 based on a number of assumptions about the evolution of disability. These assumptions are:

1. Static disability prevalence i.e. that the age and gender specific disability rates remain constant at 2006 levels.
2. The annual average rate of reduction in the disability rate maintains the age and gender specific rates of reduction observed for cognitive disabilities in the 2002-2006 period.
3. The annual average rate of reduction in the disability rate maintains the age and gender specific rates of reduction observed for physically limiting conditions in the 2002-2006 period.

Table A3: Distribution of Specified Disabling Conditions in the Older Population Overall and Among Older People Residing in Nursing Homes or Long-Stay Hospitals

	Seeing	Hearing	Speech	Mobility	Remembering	Intellectual	Emotional	Pain	Breathing	Total Disabilities
Number with this disability in total population aged 65 and over (1,000s)	26.6	31.4	9.5	91.5	40.5	6.9	26	61.4	30.1	323.9
Numbers in LTC with this disability aged 65 and over (1,000s)	4.1	3.7	5	16.3	11.8	2.3	7.3	5.9	2.8	59.2
Percentage of all people aged 65 and over with this disability, residing in nursing home/hospital	15.4%	11.8%	52.6%	17.8%	29.1%	33.3%	28.1%	9.6%	9.3%	
Percentage of disabling conditions in LTC comprised by this disability	6.9%	6.3%	8.4%	27.5%	19.9%	3.9%	12.3%	10.0%	4.7%	
Numbers in total population aged 65 and over with specified disability at severe level i.e. lot of difficulty in everyday activities or cannot do at all (1,000s)	12.3	13.1	5.3	69.7	22.6	3.6	9.1	30.1	12.8	178.6
Percentage of people aged 65 and over with specified disability at this level of severity residing in nursing home/hospital	15.4%	11.5%	56.6%	20.9%	40.3%	38.9%	38.5%	6.6%	7.0%	

Source: Calculated from National Disability Survey CSO special tabulation from main NDS sample i.e. those who reported a disability in *Census 2006*. Individuals experience multiple disabilities and appear under multiple categories of disability.

4. The annual average rate of reduction in the disability rate maintains the age and gender specific rates of reduction observed for total disabilities in the 2002-2006 period.

While the first assumption is pessimistic, the following three assumptions are relatively optimistic, since they are entirely based on recent evidence of declining disability. It could be the case that, as assumed by Whelan, in relation to the steep decline in mortality over the 2002-2005 period, the observed decline in disability over the 2002-2006 period reflects a cohort effect (i.e. the ageing of a particularly healthy generation). Comparison of the forecast disability rate reduction scenarios in Department of Social and Family Affairs/Mercer (2002) for the years 2001-2031 with the annual average disability rate reductions in the years 2002-2006 (Table A4) reveals that the actual experience of declining disability has in most categories exceeded Mercer's most optimistic assumptions. In the two categories of disability that contribute most to the population in need of residential long-term care – substantial physical limitation and cognitive impairment – the rate of reduction in disability for men has exceeded Mercer's optimistic scenario. For women the rate of reduction in the physical limitation category is close to Mercer's optimistic scenario and exceeds it in the case of cognitive impairment.

Given the relatively pessimistic or optimistic nature of the first four assumptions adopted here, a further three assumptions are adopted which employ a methodology compatible with the Whelan mortality forecasts, that underpin the demographic forecasts in this report (explained in Chapter 6, 6.23-6.24). In the absence of long-run longitudinal evidence on Irish disability rates, these further scenarios assume that the rate of reduction in disability rates will by 2021 revert to the base rates assumed in Department of Social and Family Affairs/Mercer (2002). The disability rate declines for the years 2007-2021 are calculated by linear interpolation from the annual average rate in 2002-2006 to an assumed long-run rate in 2021 equivalent to the Mercer base rate assumption. This exercise is repeated for each of the three disability measures employed above, yielding three further forecast assumptions:

5. The annual age- and gender-specific rates of reduction in the disability rate are estimated by linear interpolation from the annual average rates of reduction observed for cognitive disabilities for 2002-2006 to the Mercer base rate forecast (assumed to apply in 2021).
6. The annual age- and gender-specific rates of reduction in the disability rate are estimated by linear interpolation from the annual average rates of reduction observed for physically limiting conditions for 2002-2006 to the Mercer base rate forecast (assumed to apply in 2021).
7. The annual age- and gender-specific rates of reduction in the disability rate are estimated by linear interpolation from the annual average rates of reduction observed for total disabilities for 2002-2006 to the Mercer base rate forecast (assumed to apply in 2021).

Table A4: Mercer's Assumptions About Disability Rate Evolution 2001-2031 Compared to Actual Evolution 2002-2006

	Mercer's Assumed Annual Average Change in Disability Rates 2001-2031				Actual Annual Average Change Disability Rates 2002-2006		
	Base Projection	Static Prevalence	Optimistic	Pessimistic	Total with Disabilities	A Condition that Substantially Limits One or More Basic Physical Activities	Difficulty in Learning, Remembering or Concentrating
			%	%	%	%	%
Male							
65-84 years	-0.67%	0	-1.00	0.25	-0.44	-1.23	-6.07
85+ years	0	0	-0.67	0.25	-3.50	-0.80	-6.00
Female							
65-84 years	-0.90%	0	-1.35	0.25	-1.41	-1.04	-6.69
85+ years	0	0	-0.90	0.25	-3.10	-0.80	-5.70

Sources: Department of Social and Family Affairs/Mercer (2002) and Disability Volumes, *Census of Population, 2002* and *2006*.

Having developed assumptions for the evolution of disability rates from 2006, it is necessary to determine which population with disabilities should provide a 2006 baseline for these forecasts. To relate the evolution of disability to the Whelan/Morgenroth mortality forecasts requires that the forecasting model should differentiate between disability rates by year of age and gender. However, due to issues of sample size, the National Disability Survey (NDS) aggregates its data for severe disability by gender into two cohorts: ages 65-74 and 75 and over. This restriction presents a difficulty in forecasting disability at the same level of detail as the Whelan mortality rate forecasts. An alternative baseline for severe disability prevalence in 2006 is the prevalence of conditions that substantially limit one or more physical activities. This is suggested as a valid alternative because the age and gender-specific prevalence rates of this category of disability closely mirror the NDS rates for severe disability (Table A5).

Table A5: Comparison NDS Severe Disability Rate with Census 2006 Substantial Physical Disability Rates by Age and Gender

	NDS Severe Disability		Census 2006 Substantial Physical Limitation	
	M	F	M	F
	%	%	%	%
65-74 years	11.3	12.6	11.4	12.6
75 years and over	24.2	30.9	24.8	34.2

The advantage of using this measure as a forecasting baseline is that the Census does not share the restrictions of the NDS because it is a total population count providing disability rates by year of age and gender. Starting from this baseline of disability prevalence, and forecasting under the seven assumptions above, a range of age and gender-specific disability rates is forecast for 2021 (Table A6). The preferred forecast is based on the sixth assumption i.e. that rates of reduction in the disability rate converge from the rates of reduction observed for physically limiting conditions for 2002-2006 to the Mercer base rate forecast in 2021. This forecast is preferred for a number of reasons:

(i) The assumption of static disability prevalence is pessimistic given the recent evidence of declining disability prevalence for older people in Ireland;

(ii) Assumptions 2-4 based on the assumed continuation of recent disability trends are optimistic. They are incompatible with the demographic and mortality rate forecasts in this model, which assume that a cohort effect of improved mortality in the 2002-2005 period will converge to the lower long-run mortality rate improvement;

(iii) Of the remaining three forecasts 5-7, starting from the trend improvement in substantial physical limitation is preferred because it is the disability rate which is the greatest predictor of need for residential long-term care, as well as being the measure of disability used in the baseline population and closely approximating to the NDS severe disability rate;

Table A6: Forecast Severe Disability Rates by Age and Gender in 2021 Uunder a Range of Assumptions About the Evolution of Disability

Assumption %	1	2	3	4	5	6	7	1	2	3	4	5	6	7
				Female							Male			
65 years	9.7	3.2	7.9	13.6	5.6	8.3	10.8	9.9	5.0	8.0	13.9	6.9	8.5	11.0
66 years	9.8	3.8	7.3	12.7	6.0	8.1	10.5	9.8	3.5	7.3	12.1	5.8	8.1	10.3
67 years	10.5	3.6	9.9	15.7	6.1	9.7	12.0	10.0	4.9	7.2	11.5	6.8	8.1	10.1
68 years	10.8	3.4	7.7	11.5	6.0	8.8	10.6	10.4	4.3	7.2	11.7	6.5	8.3	10.4
69 years	12.2	4.5	9.1	13.1	7.3	10.1	11.9	11.4	4.0	10.6	15.1	6.7	10.4	12.3
70 years	12.4	4.1	9.2	12.2	7.0	10.2	11.6	11.0	3.1	8.9	12.1	5.8	9.5	10.9
71 years	14.0	4.1	11.8	12.8	7.6	12.2	12.7	12.0	6.9	8.9	14.2	8.8	9.9	12.3
72 years	15.1	4.0	11.8	12.9	7.8	12.7	13.3	13.4	6.2	11.0	13.0	8.9	11.6	12.5
73 years	17.0	6.0	13.6	13.5	10.0	14.5	14.5	14.0	5.1	9.6	11.9	8.3	11.1	12.3
74 years	17.3	6.9	12.8	12.7	10.7	14.2	14.2	14.4	4.4	9.5	11.8	7.9	11.2	12.4
75 years	19.5	4.6	14.7	14.4	9.5	16.2	16.1	16.0	3.9	13.3	13.6	7.9	13.9	14.1
76 years	21.5	6.3	18.3	16.0	11.6	18.9	17.7	17.6	7.5	15.0	16.1	11.2	15.5	16.0
77 years	22.9	5.5	18.8	16.5	11.3	19.8	18.6	19.1	5.6	19.6	15.2	10.3	18.3	16.3
78 years	25.7	9.4	24.6	19.5	15.3	23.9	21.4	20.5	6.1	16.5	16.1	11.1	17.5	17.3
79 years	28.2	11.0	23.2	17.8	17.3	24.4	21.6	22.0	8.7	21.2	16.8	13.5	20.5	18.4
80 years	29.5	10.2	25.5	19.5	17.1	26.2	23.1	23.6	8.4	20.2	16.5	13.9	20.8	18.9
81 years	32.6	12.9	28.9	19.2	20.1	29.2	24.1	24.9	9.1	20.5	16.9	14.8	21.5	19.7
82 years	34.6	15.8	31.0	22.0	22.8	31.1	26.6	26.2	13.0	25.6	18.6	17.9	24.6	21.2
83 years	39.1	12.0	44.0	25.3	21.5	39.2	30.3	29.0	11.5	32.4	19.7	18.0	29.0	23.0
84 years	39.4	17.2	36.1	24.4	25.5	35.8	29.9	30.0	21.4	28.0	20.7	24.3	27.5	23.9
85 years	43.0	15.3	40.6	27.2	26.7	41.9	34.8	33.3	17.1	28.6	18.3	24.5	31.0	25.2
86 years	43.3	18.7	31.7	21.4	29.4	37.5	31.2	33.6	9.7	25.0	20.0	19.0	29.3	26.4
87 years	48.6	23.4	41.6	30.9	34.6	45.2	39.3	37.3	14.1	46.8	26.7	23.8	41.5	31.9
88 years	50.7	20.2	44.5	32.1	33.2	47.7	41.0	40.1	14.1	40.8	25.2	24.8	40.4	32.3
89 years	53.2	24.3	59.3	36.9	37.0	56.0	44.9	40.5	14.1	30.1	22.1	24.9	35.3	30.6
90 years +	59.2	23.7	52.2	38.2	38.8	55.9	48.3	45.8	19.9	39.8	25.7	31.1	42.9	35.0

Assumptions:

(1) Static disability prevalence i.e. that the age- and gender-specific disability rates remain constant at 2006 levels.

(2) The annual average rate of reduction in the disability rate maintains the age- and gender-specific rates of reduction observed for cognitive disabilities in the 2002-2006 period.

(3) The annual average rate of reduction in the disability rate maintains the age- and gender-specific rates of reduction observed for physically limiting conditions in the 2002-2006 period.

(4) The annual average rate of reduction in the disability rate maintains the age- and gender-specific rates of reduction observed for total disabilities in the 2002-2006 period.

(5) The annual age- and gender-specific rates of reduction in the disability rate are estimated by linear interpolation from the annual average rates of reduction observed for cognitive disabilities for 2002-2006 (assumed to apply in 2006) to the Mercer base rate forecast (assumed to apply in 2021).

(6) The annual age- and gender-specific rates of reduction in the disability rate are estimated by linear interpolation from the annual average rates of reduction observed for physically limiting conditions for 2002-2006 (assumed to apply in 2006) to the Mercer base rate forecast (assumed to apply in 2021).

(7) The annual age- and gender-specific rates of reduction in the disability rate are estimated by linear interpolation from the annual average rates of reduction observed for total disabilities for 2002-2006 (assumed to apply in 2006) to the Mercer base rate forecast (assumed to apply in 2021).

(iv) To use forecast 5 based on the sharp drop in cognitive disability rates would be to apply a rapid improvement in one sub-group of disabilities to the wider population with disabilities. Only 7.5 per cent of the population aged 65 years and over reported such disabilities in Census 2006, compared to 20.2 per cent reporting substantial physical limitation and 19 per cent recording severe levels of disability in the National Disability Survey (NDS).

A more complex forecasting model could conceivably be constructed which would combine the forecast disability rates for a range of conditions weighted by their prevalence. However, the prevalence of multiple disabilities in the older population would make it a challenging exercise to reflect that reality. The trends in age-related substantial physical disability rates for men are illustrated at 5-year age intervals in Figures A3 and A4. Figure A3 shows the effect of continuing the annualised rate of reduction of the 2002-2006 period while Figure A4 shows the effect of converging from the same starting points to the Mercer base rate.

Applying these forecast disability rates to the Morgenroth forecast population in 2021 generates a range of forecasts for the population with substantial physically limiting conditions (the proxy for severe disability in this model) (Tables A7 and A8). As would be expected, the assumption of static disability prevalence yields the highest proportion of severely disabled in the over-65 year age cohort in 2021. The preferred disability rate forecast (6) yields the second highest proportion at 21.1 per cent for women, 15.9 per cent for men, and 18.6 per cent of all people aged 65 years and over (Tables A8 and A9). The growth at five-year intervals in the forecast population with severe disability based on this preferred forecast is shown in Table A9.

Figure A3: Evolution of Male Age-Specific Disability Rates 2007-2021, if 2002-2006 Trend in Reduction of Substantial Physical Limitation Continues

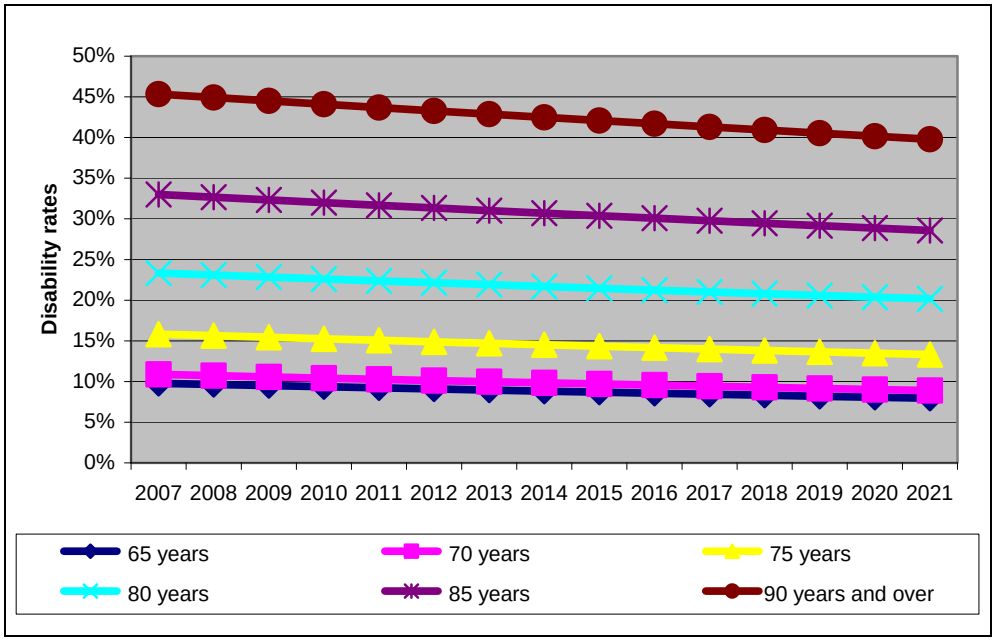


Figure A4: Evolution of Male Disability Rates 2007-2021, if 2002-2006 Trend in Reduction of Substantial Physical Limitation Declines to Mercer Base Rate

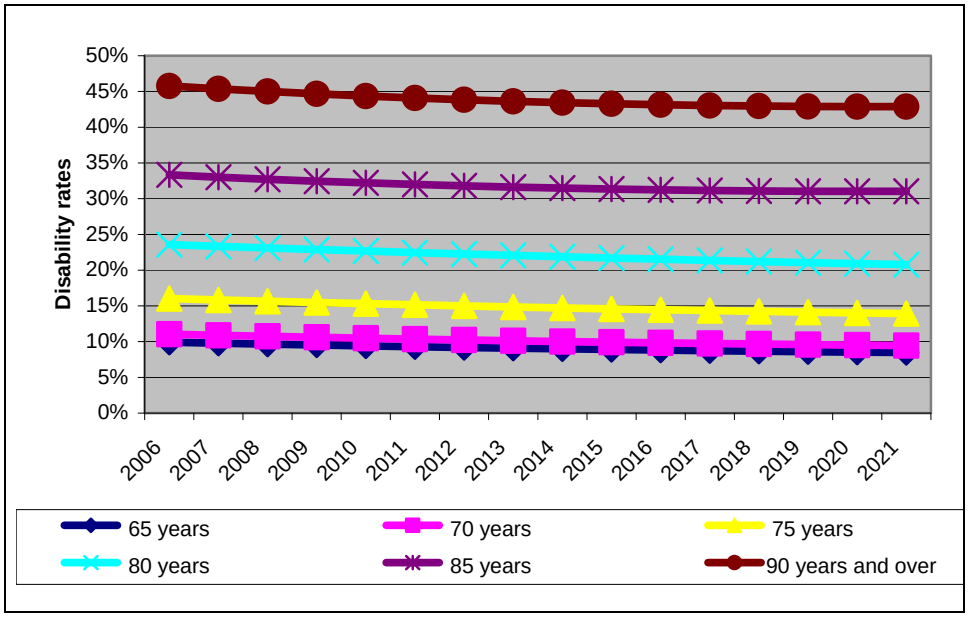


Table A7: Forecast Population by Year of Age and Gender with Substantial Physical Limitation in 2021 Under a Range of Assumptions about the Evolution of Disability

Assumption %	1	2	3	4	5	6	7	1	2	3	4	5	6	7
				Female							Male			
65 years	2,402	804	1,949	3,363	1,373	2,065	2,666	2,443	1,235	1,958	3,432	1,687	2,088	2,716
66 years	2,392	941	1,797	3,111	1,472	1,984	2,564	2,394	853	1,790	2,945	1,408	1,981	2,500
67 years	2,443	842	2,323	3,675	1,415	2,261	2,805	2,324	1,146	1,666	2,662	1,586	1,886	2,347
68 years	2,523	787	1,804	2,684	1,397	2,045	2,461	2,423	988	1,675	2,708	1,516	1,934	2,419
69 years	2,681	995	2,014	2,881	1,606	2,223	2,628	2,492	884	2,311	3,311	1,463	2,280	2,699
70 years	2,664	883	1,977	2,623	1,516	2,197	2,507	2,363	663	1,904	2,599	1,247	2,025	2,342
71 years	3,005	892	2,543	2,751	1,627	2,634	2,733	2,480	1,426	1,835	2,932	1,818	2,043	2,542
72 years	3,117	837	2,435	2,674	1,613	2,633	2,750	2,696	1,250	2,214	2,616	1,790	2,331	2,519
73 years	3,386	1,194	2,699	2,678	1,982	2,887	2,876	2,721	1,002	1,879	2,323	1,625	2,170	2,395
74 years	3,286	1,318	2,426	2,413	2,041	2,704	2,697	2,666	820	1,763	2,196	1,466	2,084	2,308
75 years	3,539	838	2,664	2,607	1,729	2,938	2,909	2,773	676	2,305	2,360	1,373	2,411	2,437
76 years	3,537	1,046	3,015	2,637	1,912	3,111	2,923	2,716	1,160	2,323	2,485	1,736	2,393	2,469
77 years	3,538	852	2,894	2,545	1,742	3,053	2,876	2,747	809	2,808	2,187	1,482	2,630	2,340
78 years	3,730	1,372	3,578	2,837	2,227	3,467	3,111	2,676	791	2,155	2,103	1,446	2,292	2,266
79 years	3,545	1,383	2,917	2,234	2,174	3,068	2,710	2,547	1,006	2,453	1,949	1,571	2,372	2,131
80 years	3,542	1,218	3,064	2,340	2,050	3,137	2,767	2,531	900	2,164	1,771	1,488	2,229	2,031
81 years	3,812	1,508	3,385	2,248	2,352	3,418	2,826	2,502	918	2,066	1,706	1,492	2,169	1,984
82 years	3,756	1,713	3,357	2,390	2,474	3,378	2,885	2,381	1,183	2,328	1,692	1,631	2,233	1,924
83 years	3,863	1,181	4,344	2,496	2,119	3,868	2,988	2,351	935	2,627	1,595	1,454	2,347	1,860
84 years	3,687	1,615	3,377	2,284	2,383	3,354	2,796	2,231	1,591	2,085	1,541	1,806	2,049	1,779
85 years	3,902	1,390	3,682	2,463	2,425	3,798	3,152	2,320	1,189	1,988	1,272	1,703	2,159	1,756
86 years	3,585	1,549	2,630	1,773	2,433	3,104	2,588	2,085	603	1,552	1,244	1,179	1,817	1,641
87 years	3,633	1,750	3,113	2,309	2,592	3,381	2,944	2,066	782	2,595	1,481	1,320	2,299	1,770
88 years	3,358	1,341	2,947	2,128	2,198	3,160	2,717	1,913	675	1,950	1,206	1,183	1,931	1,544
89 years	3,105	1,417	3,463	2,155	2,160	3,267	2,21	1,639	569	1,217	896	1,007	1,427	1,239
90 years +	15,395	6,168	13,576	9,940	10,093	14,519	12,566	6,881	2,992	5,983	3,864	4,683	6,447	5,266

Table A8: Forecast Female and Male Populations Aged 65 Years and Over with Substantial Physical Limitation in 2021 Under a Range of Assumptions About the Evolution of Disability

	F 1	F 2	F 3	F 4	F 5	F 6	F 7	M 1	M 2	M 3	M 4	M 5	M 6	M 7
TOTAL	97,428	35,833	83,975	74,241	59,106	87,654	82,067	67,360	27,046	57,595	57,075	42,157	60,024	59,225
% OVER 65s	23.5	8.6	20.2	17.9	14.3	21.1	19.8	17.9	7.2	15.3	15.1	11.2	15.9	15.7

Table A.9: Forecast Population Aged 65 and Over with Severe Disabilities at Five Year Intervals, Preferred Disability Evolution Assumption

	2006				2011				2016				2021			
	F		M		F		M		F		M		F		M	
	Rate		Rate		Rate		Rate		Rate		Rate		Rate		Rate	
Age	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.
65 years	9.7	1,468	9.9	1,516	9.1	1,830	9.3	1,882	8.7	1,935	8.8	1,990	8.3	2,065	8.5	2,088
66 years	9.8	1,485	9.8	1,472	9.0	1,660	9.0	1,667	8.4	1,891	8.5	1,859	8.1	1,984	8.1	1,981
67 years	10.5	1,528	10.0	1,421	10.3	1,799	9.1	1,591	10.0	2,161	8.5	1,824	9.7	2,261	8.1	1,886
68 years	10.8	1,499	10.4	1,396	9.8	1,655	9.4	1,535	9.2	1,917	8.7	1,833	8.8	2,045	8.3	1,934
69 years	12.2	1,669	11.4	1,488	11.2	1,658	11.1	1,648	10.5	2,108	10.8	2,171	10.1	2,223	10.4	2,280
70 years	12.4	1,662	11.0	1,378	11.4	1,643	10.3	1,470	10.7	2,053	9.8	1,871	10.2	2,197	9.5	2,025
71 years	14.0	1,816	12.0	1,421	13.3	1,921	11.0	1,518	12.7	2,243	10.3	1,776	12.2	2,634	9.9	2,043
72 years	15.1	1,895	13.4	1,528	14.0	1,936	12.6	1,634	13.2	2,212	12.0	1,947	12.7	2,633	11.6	2,331
73 years	17.0	2,045	14.0	1,503	15.9	2,071	12.6	1,510	15.1	2,402	11.7	1,740	14.5	2,887	11.1	2,170
74 years	17.3	2,004	14.4	1,445	15.9	2,032	12.8	1,483	14.9	2,072	11.8	1,587	14.2	2,704	11.2	2,084
75 years	19.5	2,218	16.0	1,529	18.0	2,232	15.2	1,651	16.9	2,282	14.5	1,836	16.2	2,938	13.9	2,411
76 years	21.5	2,369	17.6	1,538	20.4	2,429	16.7	1,698	19.6	2,620	16.0	1,949	18.9	3,111	15.5	2,393
77 years	22.9	2,375	19.1	1,530	21.6	2,451	19.1	1,834	20.6	2,597	18.8	2,115	19.8	3,053	18.3	2,630
78 years	25.7	2,521	20.5	1,451	25.2	2,692	19.2	1,703	24.6	2,889	18.2	1,870	23.9	3,467	17.5	2,292
79 years	28.2	2,757	22.0	1,480	26.6	2,690	21.6	1,747	25.3	2,886	21.1	2,047	24.4	3,068	20.5	2,372
80 years	29.5	2,746	23.6	1,462	28.2	2,744	22.5	1,678	27.1	2,939	21.5	1,921	26.2	3,137	20.8	2,229
81 years	32.6	2,844	24.9	1,388	31.3	2,900	23.5	1,560	30.2	3,085	22.4	1,815	29.2	3,418	21.5	2,169
82 years	34.6	2,757	26.2	1,265	33.4	2,828	25.9	1,517	32.2	3,074	25.3	1,888	31.1	3,378	24.6	2,233
83 years	39.1	2,967	29.0	1,277	40.1	3,134	29.7	1,488	40.1	3,517	29.7	1,986	39.2	3,868	29.0	2,347
84 years	39.4	2,605	30.0	1,103	38.2	2,881	29.2	1,332	37.0	2,994	28.4	1,674	35.8	3,354	27.5	2,049
85 years	43.0	2,625	33.3	1,102	42.4	2,946	32.0	1,305	42.0	3,228	31.2	1,687	41.9	3,798	31.0	2,159
86 years	43.3	2,337	33.6	926	39.9	2,496	31.1	1,106	38.0	2,683	29.7	1,393	37.5	3,104	29.3	1,817
87 years	48.6	2,114	37.3	782	46.6	2,542	39.6	1,168	45.5	2,829	41.1	1,641	45.2	3,381	41.5	2,299
88 years	50.7	1,696	40.1	634	48.9	2,421	40.3	1,019	48.0	2,636	40.4	1,313	47.7	3,160	40.4	1,931
89 years	53.2	1,638	40.5	518	54.8	2,223	37.4	748	55.7	2,800	35.8	1,009	56.0	3,267	35.3	1,427
90 and over	59.2	6,457	45.8	1,750	57.3	8,275	44.1	2,542	56.2	11,315	43.1	4,142	55.9	14,519	42.9	6,447
65 and over	23.0	60,097	16.6	34,303	22.2	66,088	16.0	40,033	21.4	75,365	15.7	48,885	21.1	87,654	15.9	60,024
Female and Male	20.2	94,400			19.4	106,121			18.7	124,250			18.6	147,677		

7. CONCLUSIONS AND IMPLICATIONS

Richard Layte

7.1 Introduction

This report, the third in a series of three produced for the Health Research Board, has combined the health care trend analyses of report one (Layte *et al.*, 2009) with the population projections of the second report (Morgenroth 2009) to examine likely population driven trends both in overall and regional level demand for health services in Ireland up to 2021. As stated in the introduction to this report, it is important to understand the aim of projection exercises such as this when interpreting our findings. All demographic projections are exercises in managing uncertainty and this uncertainty is amplified when demographic projections are used to project another dimension such as demand for and utilisation of healthcare. The projections created in this report are the result of judgements made on the coming together of evidence on past trends in population change in Ireland with knowledge of how such trends can interact with trends in health care utilisation and other factors such as changing morbidity patterns in the population. Past trends are not, however, an infallible guide to future developments and factors can combine in unexpected ways so our projections have to be seen as probabilistic in the sense that circumstances can change and the central forecast can quickly become redundant. This means that regular updates to the projections should be carried out to orient current policy.

7.2 Population Growth Net of Migration Trends

The truth of the last statement was made clear all too soon after the original demographic projections for this report were completed at the end of 2007. Early in 2008 the Irish economy entered a period of rapid slow down and growth quickly turned to recession as the housing market came to a standstill. The important influence which economic conditions have on patterns of migration, one of the primary determinants of demographic change, could suggest that this change in macro-economic conditions would undermine the usefulness of the existing projections. In fact, many of the demographic developments in Ireland that have a bearing on health care utilisation are actually independent of trends in migration over the period to 2021 and will continue to drive population growth even if economic conditions remain subdued. Ireland has comparatively high rates of fertility and although we forecast that fertility rates in Ireland will fall over the projection horizon, the actual number of births will not fall until after 2014. It is possible that worse economic conditions will decrease the

birth rate but the number of births is largely driven by the large size of the female cohort in fertile age groups.

Similarly, recent decades have witnessed substantial improvements in life expectancy among older age groups in Ireland and this increased longevity has contributed substantially to population growth and will continue to do so over the projection horizon of this project. The young profile of migrants to Ireland means that even negative immigration will have very little impact on the numbers of people in older age groups to 2021.

There seems little doubt that the downturn in the Irish economy will lead to fewer migrants to Ireland over the medium term, perhaps even renewed emigration. Nonetheless, it is highly likely that actual developments will converge with the reducing migration forecast built into our projections after 2014. At the minimum then, demographic trends will lead to a population increase of 11.2 per cent and an increase in the proportion aged 65 years or more of over 69 per cent (an actual increase in numbers from 468 to 792 thousand). With positive (but reducing) migration the population increase could be as high as 21.1 per cent. The likelihood is that actual population growth will be somewhere between these figures. The changing demographic structure of the population to 2021 with fewer younger people (at least after 2014) and more older people will actually increase health care requirements in most sectors since older people are more intensive users of health care on average.

7.3 Substantial Increases in the Demand for Health Care to 2021

Using our core M2F2 projection, the different chapters of this report have shown that all the main service areas will most likely experience substantial increases in demand as a consequence of population growth and ageing. The extent of the requirement by 2021 varies by sector but increases across all are substantial:

- On the basis of current utilization, population growth and ageing would require 5,214 more inpatient beds and 1,022 more day beds in Irish hospitals by 2020 (the final projection year from the PA Consulting Report (PA Consulting Group, 2007b) from which this project draws inpatient projections). This is a 54 per cent increase in inpatient beds and a 64 per cent increase in day beds between 2007 and 2020 or a total bed growth requirement of 4 per cent per annum.

- General practice consultations may increase by 32.5 per cent among those aged 16+ between 2006 and 2021 a figure that could rise to 48.2 per cent if projected changes in morbidity in the population are realised over the same period.

- Outpatient consultations may rise by 24.5 per cent overall on a current use basis but integration of trends from the period from 2001 to 2006 would see the proportionate increase in consultations in 2021 rise by 58 per cent over 2006. Worsening epidemiological trends would increase this requirement still further.

- Projections of prescribing to 2021 estimate that total ingredient costs will escalate to €1.5 billion on a current use basis and €2.4

billion if past trends from 1995-2006 prevail from €1.06 billion in 2006. These are increases of 42 per cent and 126 per cent

- Our preferred projection of demand for residential long-term care for people aged 65 years and over in 2021 is 35,200 places or 35,820 including current unmet need. This suggests a requirement for an additional 13,324 long-term care places or 59 per cent. This is 888 places per annum from 2007-2021 for people aged 65 years and over assuming an unchanged acute care system.

7.4 Coping with Demand Growth

The increased demand for health care likely to stem from demographic and epidemiological change in the Irish population is significant. Even if national finances improve substantially, the current way in which care is delivered will be unsustainable within any reasonable budget given the nature of demographic change. This demands a reconfiguration and intensification in the use of health care resources and improvements in levels of efficiency. Changes in the manner in which current resources are used and a reorganisation of services will moderate the extent of investment in services required.

PRIMARY CARE

It is clear that changes in the manner in which current resources are used and a reorganisation of services could moderate the extent of investment in new services required. For example, the increase in GP consultations expected in 2021 as a result of population growth and ageing will require an increase in GP numbers of around 300 if current GP/population ratios are to be preserved. This assumes that the current structure of GP practice would prevail. However, if the 2001 Primary Care Strategy were fully implemented in terms of the formation of primary care teams and networks, this would make more effective use of existing GP numbers. A team based practice provides access to a number of GPs thus minimising the impact of part-time working and shorter hours on the part of any one GP. Patients will not necessarily see their own GP but team working does make it more likely that a GP will be available. Team based practices also make greater use of other medical professionals such as practice nurses and local pharmacies. Practice nurses have the ability to carry out a large number of the tasks such as vaccination and monitoring of chronic conditions which currently fall to GPs. Increasing the numbers of nurses within primary care would bring significant increases in efficiency which could compensate for some of the increase in demand.

The role of pharmacists in primary care could also be much expended. Ireland has a high number of pharmacists per head of population but these offer a very limited range of services. They could provide health screening, distribution of non-prescription items to medical card holders (GPs have to prescribe these items at present for pharmacists to be refunded) and chronic disease management possibly including a form of pharmacist prescribing.[1]

[1] This would require a change in legislation covering pharmacist practices.

OUTPATIENT SERVICES

In the area of outpatient services the analyses in the first report from this series (Layte *et al*., 2009) showed that around three-quarters of outpatient consultations are return visits. Although multiple visits are unavoidable in some instances it seems clear that at least a proportion of these return visits are for the purpose of maintenance and monitoring which could be just as effectively and much more cheaply carried out in primary care. A good example of this are warfarin clinics which make up 4 per cent of outpatient consultations overall and almost 10 per cent of consultations in outpatient departments among those aged 65+. Warfarin is an anti-coagulant (blood thinning agent) used in the treatment of cardiovascular disease. Treatment with the drug requires little equipment and basic medical skills but is carried out largely in expensive public hospitals in Ireland. With suitable training and safeguards it could be carried out just as safely and effectively and far more cost-effectively in primary care.

Warfarin is just one example of a treatment currently confined to out patient departments in Irish hospitals at present but which could be carried out in the more appropriate setting of primary care. A large amount of activity within Irish hospitals is concerned with treating chronic diseases such as heart failure, diabetes and chronic obstructive pulmonary disease (COPD) and their complications and this proportion is likely to increase over time with population ageing. Although patients with these conditions require more frequent acute care than the average, evidence from Ireland and elsewhere suggests that in most instances, these conditions can be managed in primary care just as successfully as in outpatient departments.

INPATIENT CARE IN ACUTE HOSPITALS

Chapter 2 of this report has examined the patterning of day case rates and inpatient length of stay across Irish hospitals and shows that there are possibilities to improve efficiencies in Irish hospitals. The transfer of a substantial proportion of hospital activity on a day to day case basis has been one of the primary reasons for the 62 per cent rise in discharges in Irish hospitals between 1995 and 2004. Over that period the number of day patients in Irish hospitals more than doubled from 161,535 to 425,825 whilst the proportion of inpatient discharges grew more slowly. However, day case rates for any particular condition vary from 0 to 100 per cent across hospitals and within, hospitals day case rates across procedures vary widely. Although the varying complexity of the case load across hospitals can lead to differences in day case rates, the current variability would suggest that there is substantial potential to increase day rates across the Irish hospital system and in doing so significantly increase the level of efficiency.

Analyses in Chapter 2 also showed that hospitals varied widely in terms of average length of stay even controlling for a host of patient characteristics and levels of comorbidity in particular. The longer average stay of patients in voluntary hospitals is a particular concern. Analyses showed that average stays in these hospitals was 9 per cent higher than expected. Voluntary hospitals do tend to treat patients who are older and who have higher levels of comorbidity but even if we control for these characteristics their length of stay is still significantly higher than in other public hospitals. The greater predominance of older and sicker patients in voluntary hospitals suggests that they may be treating patients who would

be better cared for in long stay institutions rather than acute hospitals with the associated opportunity costs.

7.5 The Inter-Dependence of Health Care Sectors – The Preferred Health Care System

The discussion above suggests a number of areas within Irish health care where treatment is carried out in inappropriate and cost-ineffective settings. In its Transformation Programme, the Health Services Executive (HSE) has clearly committed to an 'integrated health system', also known as the preferred health system (PHS), to be achieved through the redirection of health services away from acute hospitals to primary and community care and long-stay care (PA Consulting Group, 2007a). The PHS is one of two models used in a review carried out by PA Consulting Group for the HSE which develops projections for acute hospital bed capacity to 2020 and is referred to as 'the preferred health system' as opposed to the current mode of care delivery. As set out in Chapter 2 of this report, the review estimated that if current practices were to continue 19,822 acute public hospital beds would be required by 2020. Under the 'preferred health system' this number could be reduced by more than half to 8,834. Clearly some reductions in bed numbers could be achieved through more intensive use of day procedures and shorter average length of stay and assumptions on these factors are built into the calculations in the PA report. However, the report also assumes that a substantial proportion of the activities that are currently undertaken in the acute hospital sector could be transferred into other sectors and primary care in particular. Following the recommendations of the Primary Health Care Strategy (2001) the report argues that the development of primary care services and preventative services in particular will also decrease the overall health burden to be dealt with by the Irish health care system.

Where treatment and procedures can be transferred from an acute hospital setting to a more cost-effective location whilst maintaining patient care and treatment effectiveness it is clearly sensible to do so. A reorientation of care away from acute hospitals is a sound policy overall and a sensible strategic response to the pressures which demographic change will place on Irish health care in the decades to come. The issue is the extent to which other sectors are in a position to absorb the increased demand for health care which they will face with the reorientation of services. The third chapter of this report on general practitioner care showed that Ireland already has fewer GPs per head of population than almost all other Western European countries at around 56 per 100,000 of population and substantially less than the European average of 87 per 100,000. Retirement among Irish GPs and increasing part-time working will mean that Ireland will not be able to maintain the current, low population ratios to 2021 with current supply even assuming that all those who are trained in the Irish system end up practicing medicine here. A move to the 'preferred health system' would require, at the very minimum, an increase in the ratio of GP/population to average European levels although it could be argued that a higher level of provision akin to France, Austria or Germany would be more appropriate. Chapter 3 in this report showed that moving to an EU average level of provision would itself require over 3,500 additional full-time equivalent GPs by 2021. In fact, if the current rate of GP training and supply is maintained the population ratio in Ireland will fall to 51.2 GPs per 100,000 by 2021, a shortfall of 306 GPs. If government policy of increasing training places to 150 were implemented immediately this would improve the situation but still lead to

a fall in GP/population ratio. Reaching the EU average level of supply would require the training of 250 GPs a year and their retention in the Irish primary care system at the very minimum.

In this situation a transfer of workload from the acute hospital sector to primary care looks unrealistic even if the Primary Care Strategy is implemented in full and care teams and networks for the majority of the population become a reality rather than an aspiration.

The limited supply of GPs in the Irish context also means that supply constraints in outpatient departments cannot be easily solved by transferring aftercare and specific procedures into the primary sector. As already argued such a move would substantially ease waiting times for public outpatient consultations but given the analyses in this report it is unlikely to be a realistic possibility.

The preferred health system is also premised on a reduction in the average length of stay in Irish hospitals and particularly Irish voluntary hospitals. A proportion of this reduction was to be achieved by the transfer of older patients with chronic illness requiring longer-term care to long-stay accommodation. As shown in Chapter 6 in this report simply keeping pace with population ageing in Ireland in terms of the provision of long term care will present a challenge. Projected demand for residential LTC for people aged 65 years and over in 2021 is 35,820 up from 22,500 in 2006. This suggests a requirement for an additional 13,324 long-term care places or 888 places per annum from 2007-2021 for people aged 65 years and over. Chapter 6 also shows that the number of acute beds per head of population assumed in the preferred health system is low by international standards and would imply a total number of residential long stay places of over 48,700, an additional 21,300 or 60 per cent more than those required to keep up with expected population change. This would require the addition of 1,423 new long-stay residential beds per annum between 2007 and 2021 a challenging prospect even if the financial environment were more conducive.

The aims of the PA Acute Hospital Bed Capacity Review: A Preferred Health System in Ireland to 2020 (PA Consulting Group, 2007b) are laudable given the difficult demographic trends which Ireland will face over the next decade or so. The projection results contained in this report, however, suggest that the capacity of other health care sectors and primary care and long-stay care to absorb a reorientation of care away from acute hospitals is extremely limited at present and over the period to 2020 without substantial and sustained investment.

7.6 Future Research Needs

The introduction to this chapter argued that population and health care projections face inevitable uncertainty and cannot take account of all future events. A good example of just such an event is the recent downturn in the Irish economy. Although the recession does not undermine the value of the projections used in this project it does have implications for many of the processes we discuss. Such uncertainties mean that projections should be updated on a regular basis to take account of events.

The probable increased demand for care outlined in this report has important resource implications. Unfortunately, it was not within the remit

of this project to examine these implications but the fact remains that a thorough approach to the strategic development of health care in Ireland over the coming decades will require detailed projections of the resources required. These analyses should be carried out with some urgency.

Lastly, a clear understanding of morbidity trends and their impact on the demand for health care is essential if we are to plan services strategically. This project was not in a position to undertake a thorough examination of morbidity trends and so adopted estimates from elsewhere which were not differentiated by age and other important factors. This inevitably impacts on the precision of our estimates since population ageing has particular implications for the prevalence of poor health across a society. One particular dimension which should receive attention is the relative roles of ageing and proximity to death in structuring the demand for health care and how population health among older age groups may influence this relationship.

REFERENCES

PA CONSULTING GROUP (2007a). *Health Service Executive Acute Hospital Bed Capacity Review: A Preferred Health System in Ireland to 2020. Detailed Report.* PA Consulting Group.

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