6. LONG-TERM HEALTH AND SOCIAL CARE

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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.
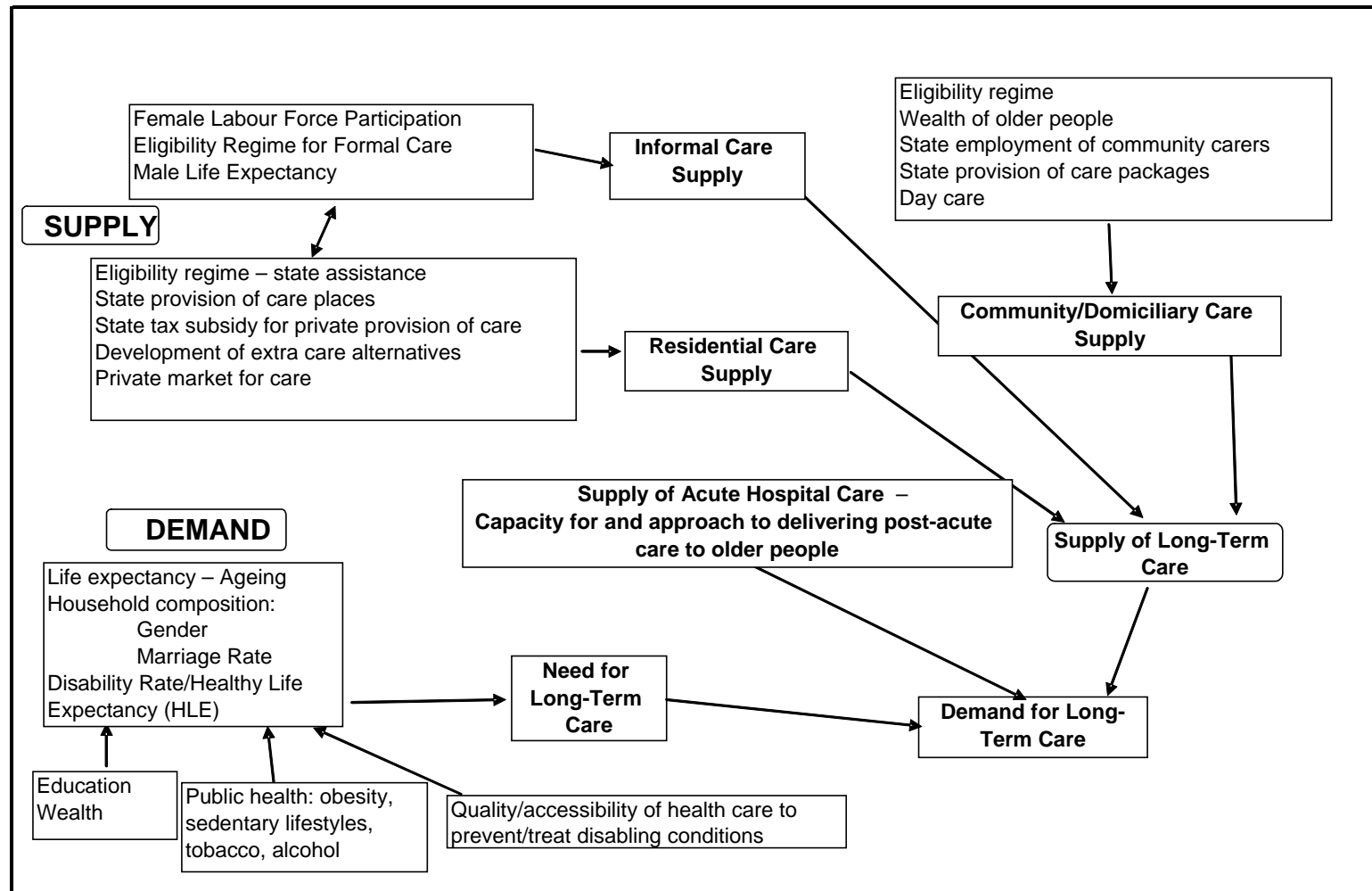
6.2 Data Sources

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

Female Labour Force Participation
Eligibility Regime for Formal Care
Male Life Expectancy

Informal Care Supply

Eligibility regime
Wealth of older people
State employment of community carers
State provision of care packages
Day care

SUPPLY

Eligibility regime – state assistance
State provision of care places
State tax subsidy for private provision of care
Development of extra care alternatives
Private market for care

Residential Care Supply

Community/Domiciliary Care Supply

Supply of Acute Hospital Care –
Capacity for and approach to delivering post-acute care to older people

Supply of Long-Term Care

DEMAND

Life expectancy – Ageing
Household composition:
        Gender
        Marriage Rate
Disability Rate/Healthy Life
Expectancy (HLE)

Need for Long-Term Care

Demand for Long-Term Care

Education
Wealth

Public health: obesity, sedentary lifestyles, tobacco, alcohol

Quality/accessibility of health care to prevent/treat disabling conditions

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.
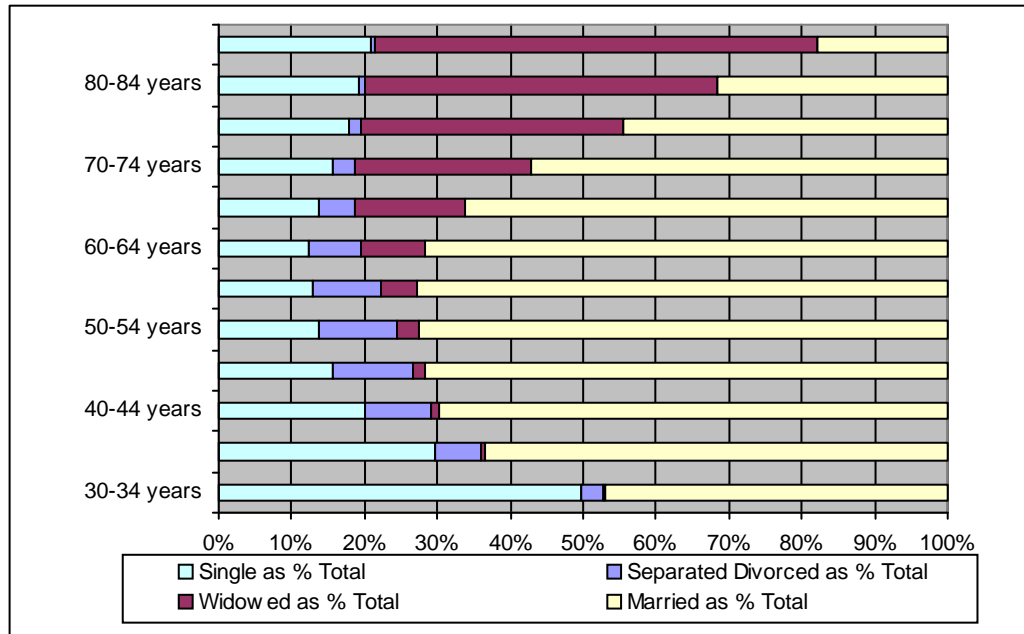
Whereas in 2006 the number of women aged 85 years and over was 124 per cent of the number of men, by 2021 the percentage difference in numbers of women over men at these ages will have declined to 49 per cent. Reductions in the difference between numbers of women over men occur across all age cohorts 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
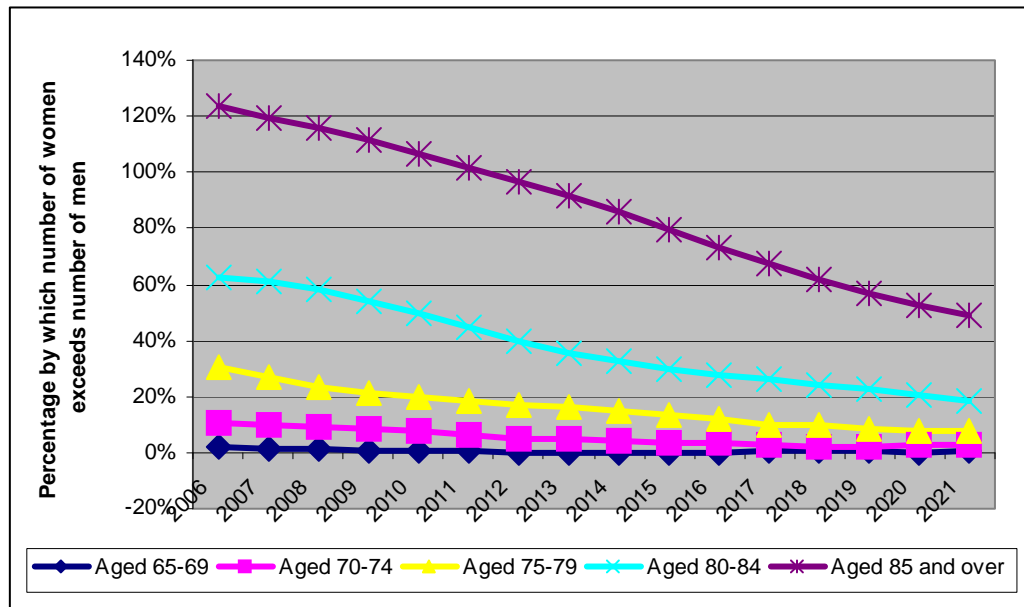
Calculated from Morgenroth (2009).

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

**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

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[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 inexpensive.* (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+	1990 2004 Female Labour Force Participation %		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
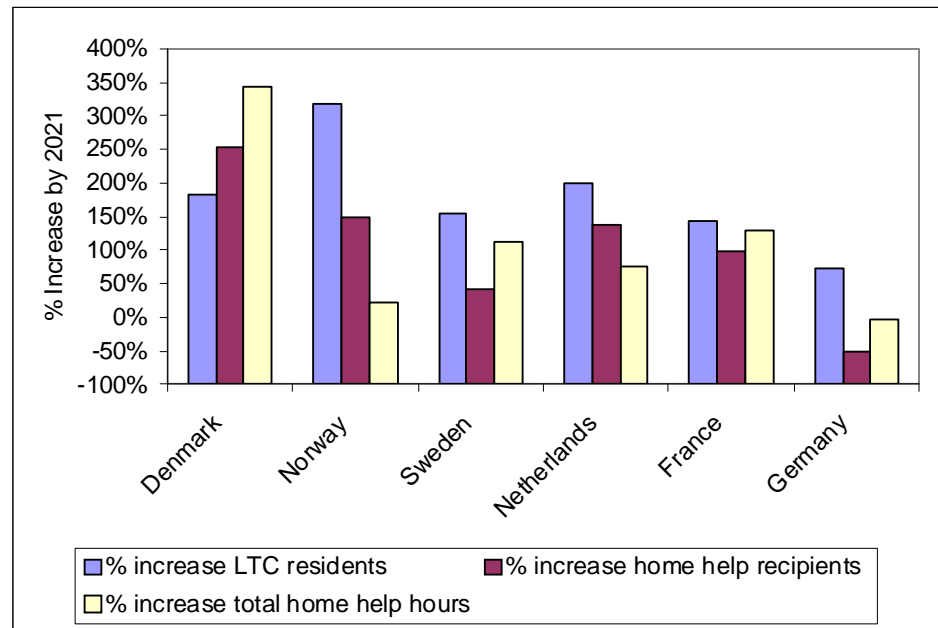
Source: Calculated by applying the coverage rates for other countries in Table 6.11 to Ireland's forecast population in 2021. Calculated as increase required from Irish level of provision in 2006.

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
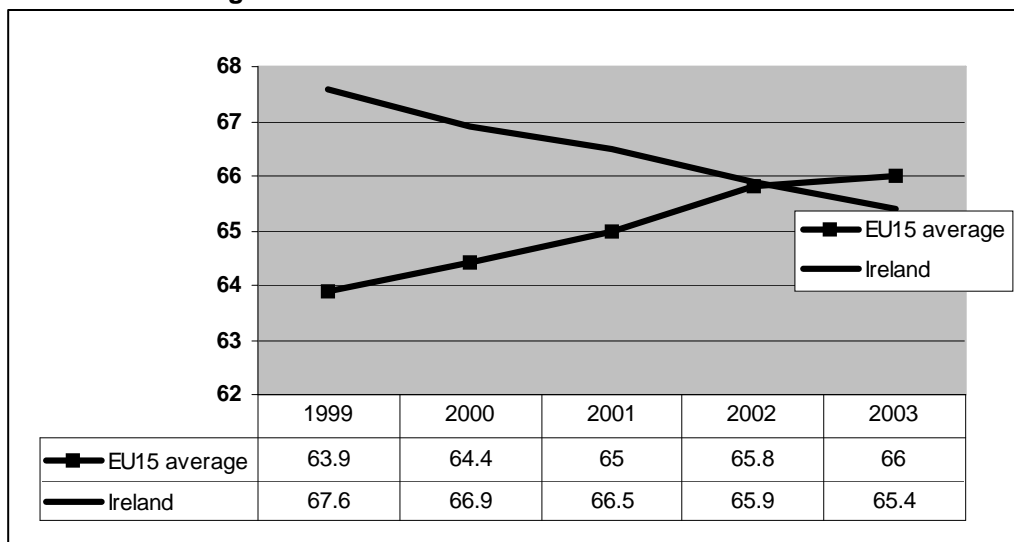
Source: Eurostat.

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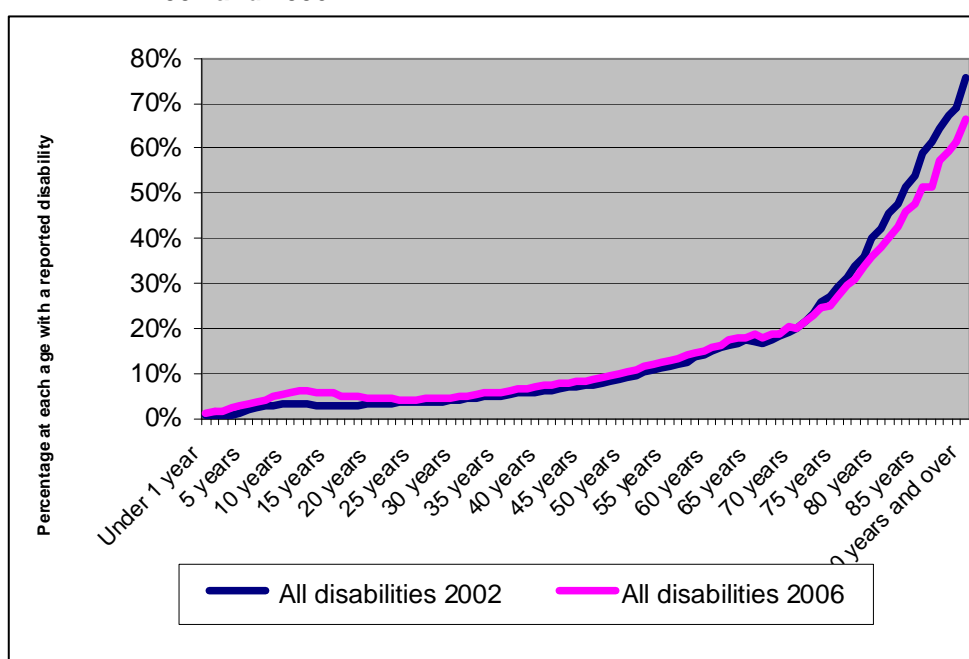
Source: *Census of Population,* Disability Volumes, *2002* and *2006*.

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 Female	5	6	7	1	2	3	4 Male	5	6	7
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
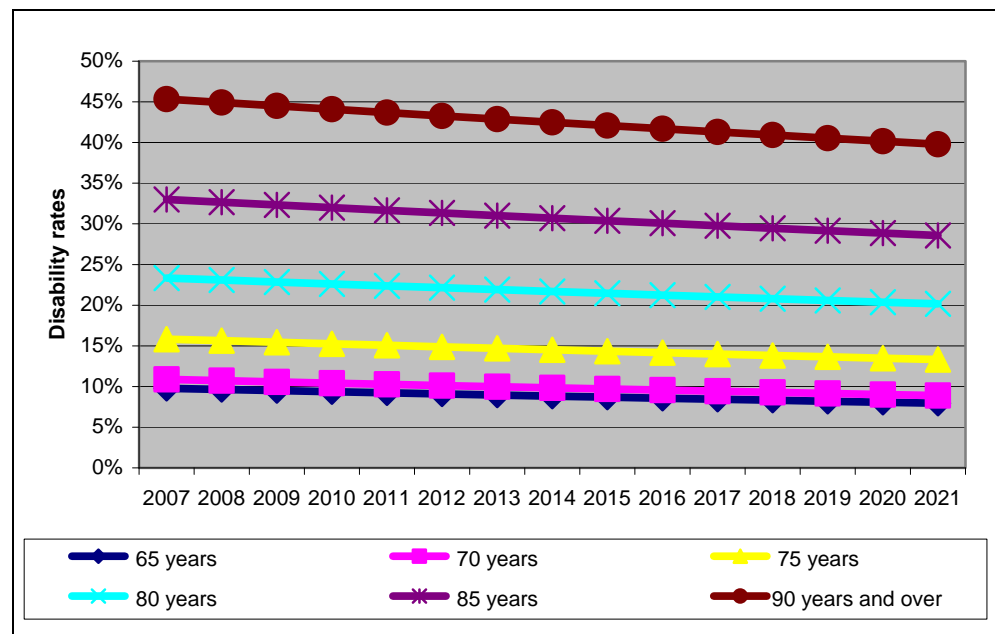
Figure A4: Evolution of Male Disability Rates 2007-2021, if 2002-2006 Trend in Reduction of Substantial Physical Limitation Declines to Mercer Base Rate
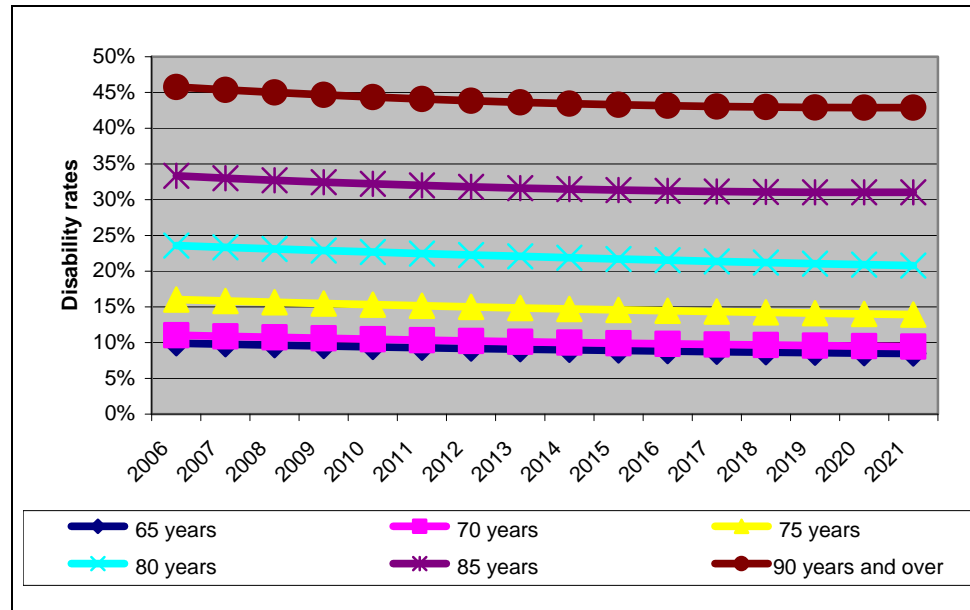
Table A7: Forecast Population by Year of Age and Gender with Substantial Physical Limitation in 2021 Under a Range of Assumptions about the Evolution of Disability

Assumption %	1	2	3	4 Female	5	6	7	1	2	3	4 Male	5	6	7
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

Age	2006 F Rate %	2006 F Nos.	2006 M Rate %	2006 M Nos.	2011 F Rate %	2011 F Nos.	2011 M Rate %	2011 M Nos.	2016 F Rate %	2016 F Nos.	2016 M Rate %	2016 M Nos.	2021 F Rate %	2021 F Nos.	2021 M Rate %	2021 M 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		