

Barrett, Alan; Rust, Anna

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Projecting the Future Numbers of Migrant Workers in the Health and Social Care Sectors in Ireland

Alan Barrett (ESRI)¹ and Anna Rust (NUIG)

Abstract: Ireland will experience population ageing in the coming years, whereby the percentage of the population aged 65 and over will rise from its current level of 11 percent to over 20 percent in 2035. A number of papers have looked at the implications of this process for the public finances. However, less attention has been paid to the human resource needs that will arise if increased demands are placed on health and social care systems. In this paper, we provide projections of the possible numbers that will be needed to work in the health and social care sectors out to 2035. We also consider what proportion of the extra employees will be migrants. We discuss both practical and ethical issues which arise when foreign health and social care workers are recruited.

Corresponding Author: Alan.Barrett@esri.ie

¹ This paper is one component in a broader project on migrant workers and the social care sector being undertaken by the ICSG at NUIG in collaboration with COMPAS at University of Oxford, University of Georgetown and University of Ottawa.

Projecting the Future Numbers of Migrant Workers in the Health and Social Care Sectors in Ireland

Section 1: Introduction

Ireland is currently in a period of demographic change that will have significant impacts on a number of areas of Irish life. The population is (a) growing and (b) altering in terms of its age structure, whereby significant extra demands are being, and will be, placed on a range of public services, including health and social care. A number of papers have looked at these increased demands in terms of their financial burden (see, for example, Barrett and Bergin, 2005). However, less attention has been paid to another dimension of the issue, namely, the human resource requirements of an expanding health and social care system.

In this paper, we seek to shed some light on the issue of the future human resource needs in the areas of health and social care in Ireland. We do so by using population projections to derive projections of the numbers of health and social care workers needed in Ireland out to 2027 and beyond to 2035. The 2027 timeframe is used on the basis of twenty years being a sensible time horizon. However, as the trends that will be observed out to 2027 continues after this date we thought it was useful to provide the additional information out to 2035. By stopping at 2027, the idea might be created that any problems with regard to labour shortages might have been solved by then. Having produced estimates of the numbers of health and social care workers needed, we go on to estimate how many of these will be migrant workers.

Ideally, we would like to provide separate projections for the healthcare and social care systems but this has not been possible. The most reliable source of data for the numbers currently employed in these areas comes from the CSO and they do not provide this healthcare/social care breakdown. Instead, they simply provide information on the number of nurses/midwives, nurse's aids/care assistants and "other health associate professionals". In our projections below, we aggregate these groups into one and label it "healthcare workers". Hence, in the rest of the paper reference to healthcare workers should be understood as covering this group, some of whom will be working in the social care sector. It would also have been desirable to have

information on what proportion of healthcare workers work with older people but, again, this information is not available. In our projections below, we attempt to apportion healthcare workers across the younger and older populations. More details are provided in the relevant section.

Although our inability to consider the health and social care systems separately has its disadvantages, there are also advantages. As our analysis below involves projections over a period of almost thirty years, there is obviously a huge margin of error attaching to the projections. By looking at categories of workers in more aggregated forms, we are hopefully reducing the margin of error and are certainly steering away from creating the false impression that we can project smaller categories of workers with any degree of reliability. It is this consideration that leads us away from considering nurses/midwives and care assistants separately, even though we do have this data. Over time duties that are performed by nurses could be transferred to care assistants, whereby there would be a shift between the two groups in terms of numbers needed. By aggregating the two groups and providing long-run projections for them as a single group, such switching is removed as a concern from the analysis.

While the core of the paper involves a mechanical exercise, it is clear that the employment of foreign personnel for the healthcare system gives rise to a wide range of issues for both the sending and receiving countries. These issues include legal arrangements with regard to residency, broader cultural and social issues with respect to immigrant integration and finally the ethical issues that arise from depleting the healthcare resources of source countries. The paper also includes discussions of these issues so that the numbers presented below in the projections section are understood in their wider context.

The paper is structured as follows. In the remainder of this introductory section, we provide a brief overview of recent research findings on the characteristics and labour market outcomes of immigrants in general in Ireland. This is by way of providing a broader context for the specific discussion on the health and social care sectors which is the focus of this paper. We then go on to discuss the recent situation in Ireland regarding the efforts by the authorities to improve the career situation of nurses generally and also their efforts at foreign recruitment. We also discuss changes in the

immigration system as they relate directly to nurses. All of this material should be seen as relating to current efforts to deal with existing shortage of nurses. In Section 2 we discuss the international situation with regard to the use of non-national workers in the care sector. In Section 3 we move on to the population projections, the associated projections of human resource needs in the healthcare sector and the extent to which these needs might be met through the recruitment of migrant workers. In Section 4, we summarise our analyses and offer some conclusions.

Before turning to the details of the situation in Ireland, it is important to address one further issue. The discussion and analysis in this paper is based on the assumption that there will be health sector labour shortages in Ireland in the future because of an under-supply of Irish nurses relative to demand. From the perspective of economics, this may seem like an odd assumption as there would be an expectation that any under-supply would lead to wage increases and hence and increased inflow into the sector.

As discussed by Raghuram and Kofman (2002), the nature of the healthcare sector is such that the standard market mechanisms are unlikely to apply. As the provision of health care is dominated by the public sector, the provider of healthcare services (i.e. the state) is in a position to alter immigration rules so that any under-supply is met through the inflow of foreign workers, as opposed to wage increases. In addition, as the state has an incentive to constrain wage inflation in the healthcare sector, such foreign recruitment is likely to be attractive. For these reasons, we think it is reasonable to see development in human resource needs in the healthcare sector as resulting in increased inflows from outside of Ireland as opposed to wage increases and hence an increased inflow from domestic sources².

² It could be the case that expansion of the health and social care systems will occur through the private system. Even if this is the case, it could well be the case that the government would come under pressure to ease immigration restrictions if the cost of such care was rising because of labour supply constraints.

1.1 Immigrants in Ireland³

Starting with Barrett and Trace (1998), a number of papers have looked at the characteristics of immigrants in Ireland (Barrett et al 2006; Minns 2005). Barrett and Trace showed that immigrants in the mid-1990s were a highly educated group, with levels of education that significantly exceeded those of the native population. One of the hypotheses explaining this observation was that the immigrants of the 1990s were “early movers” and may have had access to more information on Ireland. This gave rise to an expectation that the level of education among immigrants would fall as inward migration continued and increased.

The later analyses of immigrant characteristics continued to show immigrants as being a highly educated group, based on both the Quarterly National Household Surveys (Barrett et al, 2006) and the Census 2002 (Minns, 2005). It was also shown that immigrants had higher rates of labour force participation and higher employment rates. Barrett and Duffy (2008) did show that the level of education among immigrants was lower among the more recent arrivals. Even so, the most recently arrived cohort (as of 2005) still had higher levels of education than the native population.

On the issue of how migrants are performing in the Irish labour market, the evidence suggests that they do less well than the native population. Ruhs (2005) provided the first study on earnings but his data was limited to work permit holders and so omitted the many EU nationals who were living in Ireland at the time of his analysis. Barrett and McCarthy (2007a) show that immigrants earned 18 percent less, on average, relative to native workers using data for 2004, controlling for factors such as education and length of labour market experience. For immigrants from non-English speaking countries, this wage gap is 31 percent. Barrett and McCarthy also show that the wage gap is biggest for the more highly educated immigrants, relative to comparable native employees. Similar results are found in Barrett and McCarthy (2007b), where data from 2005 is used.

³ The discussion in this section is largely based on Barrett and McCarthy (2007b).

The issue of labour market performance is also addressed in Barrett et al (2006) and Barrett and Duffy (2008). As these papers use the CSO's Quarterly National Household Survey, the sample sizes are larger than that used by Barrett and McCarthy. However, as the QNHS does not include information on earnings, the analyses in these papers use occupational attainment rather than wages as a measure of labour market outcomes. Both papers show how immigrants are less likely to be in higher-level occupations, controlling for factors such as age and education, and label this as an "occupational gap". Barrett and Duffy (2008) also show how this "occupational gap" is largest for immigrants from the EU's New Member States and how the gap does not seem to decline for this group as they spend longer in Ireland. Based on this finding, Barrett and Duffy conclude that there is an absence of evidence of increased labour market integration of immigrants over time.

1.2 Setting out the current situation in Ireland's healthcare system

There have been significant investments in the health system in recent years to match the increase in demand for healthcare. This is partly as a result in the rise of the population but also because of lack of investment in the health system in the 1980's. Spending rose very rapidly in the 1990s, after a decade of restraint and cut-backs. According to OECD, total (per capita) spending on healthcare in Ireland exceeded the EU average for the first time in 2002 at 101.8% of per capita average. As an example of increased investment in the health service, between 1997 and 2007 the number of people employed in the health system increased by 91%, from 114,600 to 218,600.

CSO data show that there were 51,145 nurses/midwives working in Ireland in 2006, 9,405 nurse's aids/care assistants and 620 other health associate professionals. This means that the total number of people working in these areas combined was 61,170 in 2006. In order to provide this number of healthcare workers in Ireland, it has been necessary to make nursing a more attractive profession for Irish people and also to hire in migrant workers.

As regards improving nursing as a profession, these improvements have resulted in changes in the education and training of nurses from a higher diploma to an honours degree, in order to increase the appeal of nursing as a profession. Not only has there

been an upgrading in the qualification awarded to nurses upon graduation, there has also been increased capital investment of €240 million in nursing education facilities in 13 higher education institutions around the country (Quinn, 2006). Moreover, approximately €90 million was allocated to undergraduate nurse training in 2005 (Quinn, 2006). Other incentives introduced to increase the supply of mature workers and students into the nursing profession include 'back to practice' courses for those out of the workforce and financial supports for nurses pursuing part-time degrees. (Irish Nursing Board, 2006). There were also increases of 58% between 1997 and 2004 in the basic salary of a staff nurse (Quinn, 2006). In addition, the promotional structure within nursing has been improved and flexible working conditions.

Changes have been made in recent times to the labour market for nurses' aids. In Ireland, the educational standard for a nurse's aid is to have a level five FETAC award. There are various specific training courses to become a care worker or a nurse's aid depending on whether you wish to work in a hospital, long-term care facilities for the elderly or with children. The FETAC award (level five) in "Healthcare Support" is a general 'major' award type. If a person is employed by the HSE they must have FETAC level 5 training in 'Healthcare support'. In 2006 there were three new categories included for award certification including: care for the older person (level five), care practice in community care (level five) and care support (level five) (FETAC, 2006).

1.3 Recruitment of Migrant Healthcare Workers.

The issue of labour shortages is a complicated matter and not all observers would agree that there are labour shortages in nursing in Ireland. The Irish ratio of nurses per 1000 population is 15.2 which is much higher than the OECD or EU15 average of 8.6 (OECD 2007) and 8.5 (FÁS 2005) respectively. It has been argued that Irish nurses spend time on tasks that could fall within the remit of other personnel such as health care assistants as discussed above. There are therefore efforts to bring the duties of Irish nurses into line with other OECD health care systems (Quinn 2006).

Ireland, historically a net exporter of nurses to countries such as the UK and the USA, began in the 1990s to encounter nursing shortages. As a result, employers of

healthcare workers initiated international recruitment campaigns to facilitate the migration of qualified nurses to Ireland.

As discussed by Quinn (2006), the two public recruitment projects in relation to nursing in Ireland are (1) the HSE Nursing/Midwifery Recruitment and Retention National Project and (2) the Dublin Academic Teaching Hospitals (DATH) Recruitment Project. The HSE recruitment project has involved two recruitment drives. In 2005 nurses were recruited from the Philippines and India, while in 2006 the drive targeted only India. The selection of countries depends on the type of personnel needed in Ireland. For example, Indian nurses have experience in, and may prefer to work in, acute hospitals while Filipino nurses are skilled in care of the elderly. The HSE has built up a relationship with the Philippines, so as to enable Ireland to attract more qualified nurses to come and work with older people if there are domestic shortages in the future.

In 2006, the Dublin Academic Teaching Hospitals recruitment project has targeted India, Bahrain, Singapore and the Philippines. There is also substantial recruitment of nurses by private agencies into private institutions, particularly from India. The DATHs project has recruited approximately 1,000 nurses since it was set up in 2001 in response to a shortage of nurses in the hospitals. Of that number, 507 were recruited in 2005 to fill the gaps resulting from the lack of domestic graduates caused by nursing changing from a three-year to a four-year course (Quinn 2006).

1.4 Visa/Work Permit issues

In very broad terms, Ireland's labour immigration system is made up of the following elements. Permission to work here is open to all citizens of the EU, with the exceptions of Bulgaria and Romania. All others must have either a work permit or a Green Card. The Green Card is the more attractive option for immigrants as they allow employees to apply for immediate family reunification and a pathway to permanent residency after two years, in normal circumstances. Once the spouse/family members are legally resident in the State on the basis of being the employee's spouse or dependant, they are free to seek employment and to apply for a Spousal/Dependant work permit.

Applications for a Green Card may be made in respect of two categories of occupation, based on salary level:

- Firstly, where the annual salary (excluding bonuses) on offer is €60,000 or more, the Green Card Permit is available for all occupations, other than those which are contrary to the public interest;
- Secondly, Green Card Permits are available in the annual salary range €30,000 - €59,999 (excluding bonuses) for a restricted number of strategically important occupations as specified by the Department of Enterprise Trade and Employment.

These occupations include:

- Medical Practitioners,
- Pharmacists/Pharmacologists and related occupations,
- Registered Nurses,
- Registered Midwives,
- Specialist Nurses and
- Dental Practitioners.

Depending on where migrant nurses completed their nursing education and training, they must also comply with various rules in order to register with An Bord Altranais. For applicants trained in a non-European Union country, English language competence is required at a level that supports communication and enables the applicant to practice nursing safely and effectively in Ireland. Therefore, proof of English language competence in cases where English is not the first language or primary language of expression of the applicant is required. Applicants must also have completed a programme of education and training of not less than three years duration and the programme must have had a balance of not less than one-third theoretical instruction and not less than one-half clinical/practical instruction (Irish Nursing Board, Information on Requirements and Standards 2006). An Bord Altranais has introduced a competency-based assessment during the period of adaptation, involving supervised practice plus further education and training, if necessary. The adaptation period takes at least 6 weeks to complete, but it is acknowledged that most

candidates can require up to 12 weeks to achieve the identified competencies (Quinn 2006).

If migrants have completed their nursing education and training in a European Union member state the rules are different. In that case, they must attain certain qualification/experience before entitlement to a direct registration with An Bord Altranais in accordance with EU Directives 77/452/EEC, 77/453/EEC and subsequent amendments, or the Act of Accession (Irish Nursing Board), which relates to the recognition of qualifications received in other member states.

Other changes introduced to attract certain skilled non-EEA nationals include entitlements of work permits for spouses. This facilitates easier integration of immigrants into Irish society. Finally, with regard to care assistants, non-EEA nationals that wish to work in Ireland as a care assistant must apply for an Employment Permit through the Department of Enterprise Trade and Employment. As care assistants do not qualify for a Green Card they must apply for a Work Permit. To do so they must have a contract with an employer established in Ireland before an application for a work permit is granted.

1.4 Recent trends

Statistics from the CSO show that the proportion of migrant nurses in the Irish workforce has increased substantially in recent years. While only 2% of the health and social care workforce were foreign nationals in 1998, this proportion had increased to 8% by 2004 and to 16.5% by 2006 (CSO, 2006). Between the years 2000 and 2006, 9,441 nurses were issued with Work Visas/Work Authorisation, of which 90% went to nurses from India and the Philippines. The total number of Work Authorisation/Work Visas issued to nurses accounted for 60% of all skilled professionals between the same years (College of Surgeons in Ireland, 2008). The years 2001, 2005 and 2006 were years of particularly strong overseas recruitment. This correlates with the active recruitment projects by the DATH's and the HSE due to the lack of Irish nursing graduates in those years. In 2007, there were 4,329 Employment Permits issued under the 'Medical and Nursing' category. The

Department does not split the data between Work Permits and Green Cards issued and hence we cannot compare work permits issued in previous years.

Section 2: The International Situation

In this section, we set out some of the issues relating to healthcare workers and migration from an international perspective by way of providing context. Before looking at the specifics of healthcare, we should note that the Republic of Ireland is host to just a small fraction of the estimated 191 million international migrants in the world today (UN, 2006). However, the ratio of foreign-born to the local population in Ireland is comparable to other industrialized countries. Ireland's proportion of 10.4 per cent of foreign-born exceeds that of its nearest neighbour the United Kingdom (8.3%) and is similar to countries with a longer history of immigration (OECD, 2005). For example, the percentage of foreign-born residents in the United States stands at 12.3 per cent, while in Germany it has reached 12.5 per cent. (National Economic and Social Council Report 2006)

2.1 The Globalisation of the Care Sector

Europe as a whole is facing a demographic challenge characterized by declining fertility rates and a rapidly ageing population⁴. In recent years, these demographic and societal changes have contributed to significant, long-term labour shortages in the healthcare sector. In certain cases where policy-makers have identified a shortage of healthcare workers, one of the responses to the labour shortage has been to employ migrant workers. This offers a “quick fix” which can be attractive to policy makers. It can take three to five years to train a nurse, and fifteen to twenty to train an experienced senior physician (Stewart, Clark and Clark 2007). Recruiting in other countries can deliver these staff much quicker and without the expense of education and training costs. However, this “quick fix” leads to questions about the economic

⁴ With the highest fertility rate in the EU- 25, Ireland's demographic projections are positive compared with the rest of the region, and the country currently has less need of migration as a means of replacing the dwindling working-age population (NESC 2006). However, as will be seen in Section 3 below, this will change.

and social integration of migrant care workers and also about the impacts on sending countries⁵.

2.2 Data/ Statistics

Almost every European country is experiencing a shortage of registered nurses (Stewart, Clark and Clark 2007). For example, the UK had 57,000 fewer nurses than needed to staff the National Health Service in 2001. Australia faced a 40% shortage of nurses to fill open positions in 2006; by 2011 Canada could have a shortfall of 78,000 nurses. Virtually all developing countries suffer from a chronic shortage of nurses. The Philippines, the country from which the largest number of registered nurses migrate to developed countries had 30,000 vacancies for nurses in 2004. In 2003, Malawi reported that only 28% of nursing positions were filled; in the same year South Africa had a shortage of over 32,000 registered nurses. The best estimates indicate that, collectively, sub-Saharan African countries have a shortfall of over 600,000 nurses (ICN, 2004).

English-speaking countries constitute the most popular destination in the global labour market for nurses. The Philippines supplies the largest number of foreign nurses to the United Kingdom, while South Africa, Nigeria and Zimbabwe, Australia, India and a number of Caribbean countries also provide significant numbers of registered nurses. The Philippines represents the greatest source of foreign nurses in the United States, followed by Canada, the Republic of Korea, India, and the United Kingdom. In 2001, about two-thirds of the new nurses registering in Ireland were from other countries, mainly Australia, India, the Philippines, South Africa and the United Kingdom (Stewart, Clark and Clark 2007).

2.3 Receiving Countries: Policy Issues

As discussed by Buchan (2007), policy responses to shortages in the developed world have included ‘fast tracking’ of work permit applications, developing coordinated, multi-employer approaches to recruitment to achieve economies of scale in the

⁵ The Philippines is the country from which the largest number of registered nurses migrate. The countries employing the greatest number of Filipino nurses are the United States, Ireland, Saudi Arabia and the United Kingdom.

recruitment process and developing multi-agency approaches to coordinated placement of health workers when they have arrived in the source country. These may include the provision of initial periods of supervised practice or adaptation, as is the case in Ireland, as well as language training, cultural orientation and social support to ensure that the newly arrived workers can assimilate effectively into the new country, culture and organisation.

The UK probably has the most systematic and coordinated recruitment programme of any country in the world. The British National Health Service (NHS) has its own recruitment programme to identify healthcare professionals interested in immigrating to the UK. It operates different recruitment strategies for the various professions. It usually recruits physicians on an individual basis, but tends to recruit nurses in groups of ten, twenty, or more from a specific country. As part of its recruitment process, the NHS provides information on job locations, living arrangements and immigration procedures (Stewart, Clark and Clark 2007).

Ethical concerns raised about the impact of migration on developing countries have caused the national health services in the UK and Ireland to adopt ethical guidelines for the recruitment of overseas nurses. These guidelines require host agencies to provide accurate and truthful information to potential recruits about terms and conditions of employment. However, these guidelines do not apply to private healthcare facilities. Nor do they restrict public healthcare systems from hiring foreign nurses who migrate and apply for positions on their own initiative.

Another approach to regulating the migration of healthcare professionals is the signing of inter-country agreements that place limits on the number of professionals who can be recruited, thus minimizing the damage to the sending country's health system. In 2003, the National Health Service and the South African government reached agreement on an exchange programme entitling healthcare professionals of both countries to work in the other country for up to six months. Although the programme will probably bring more South African registered nurses and medical doctors to the UK than the reverse, the migration will be for a fixed period of time (Stewart, Clark and Clark, 2007).

2.4 Sending Countries: Policy Issues

The reasons why nurses and doctors might leave their own health systems include push factors such as poor compensation, poor working conditions or low career opportunities. Along with such factors, pull factors can also cause workers to migrate. For example, after adjustment for the cost of living, nurses' salaries in Australia and Canada are double those of nurses in South Africa, 14 times those in Ghana, and 25 times those in Zambia (Stewart, Clark and Clark 2007.).

The loss of healthcare workers is damaging to evolving health care systems within developing economies. As developing countries generally lack the resources to train an adequate number of nurses in the first place, the loss of some of the stock of nurses exasperates the problem of providing adequate healthcare for citizens of the developing world. The fact that migrant health care workers send back remittances to the source country partially compensates for training/educational costs and damage to the healthcare system of the source country. However, there is scant evidence that remittances actually compensate for the damage done to healthcare systems in source countries, particularly since remittances go to families, not directly to the healthcare system itself. (Stewart, Clark and Clark, 2007).

There has also been some support in the international assembly of the World Health Organisation for a fund that would train healthcare personnel in developing countries negatively affected by migration. The fund would be financed by developed countries as compensation for the investment in training lost by developing countries. There are other policy initiatives that could help sending countries (Buchan, 2007). These include:

- Staff Exchanges - structured temporary movement of staff to other organisations can be established based on career and personal development opportunities/organisational development;
- National government-to-government bilateral agreements – the destination country can develop agreements with source countries to underwrite the costs of training additional staff, and/or to recruit staff for a fixed period

- Ethical recruitment code – the destination country could introduce a code that places restrictions on employers, in terms of which source countries can be targeted, and/or length of stay.
- Compensation – the destination country could pay compensation, in cash or in the form of other resources, to source the country.

Section 3: Population projections and projections of care workers needed

We now turn to the main issue of the paper, namely, projecting the number of migrant healthcare workers that will be needed in the older adult Irish health and social care sectors out to 2035. We will begin this section by outlining how we arrive at the population projections that underpin our projections of migrant worker needs. We discuss the results of the population projection exercises and then go on to outline how we use the population projections to arrive at migrant worker projections. In what follows, a number of scenarios are presented. As with all exercises of this nature, it is important that the results be seen as projections as opposed to forecasts. What we are providing is estimate of how the world might look, under certain (reasonable) assumptions.

3.1 Population Projections

In arriving at projections of the population out to 2035, we have adopted the assumptions used by the CSO when they last published population forecasts in 2004. As those same CSO projections were produced before the Census of 2006, we thought it was preferable to apply the 2004 assumptions to the new baseline of 2006 rather than using the 2004 projections. It is possible that the CSO will alter their assumptions when they come to produce their next set of population projections, based on the 2006 baseline. However, for the present purpose, we believe our approach to be preferable to using the 2004 figures as it provides a more up-to-date picture of possible population developments while at the same time using assumptions that are unlikely to be altered dramatically.

The assumptions needed to generate population projections are those relating to fertility, migration and mortality. The CSO present a number of scenarios based on

three different fertility assumptions, two in the case of migration and one for mortality. Rather than presenting the full set of scenarios, we have chosen to restrict our analysis to one fertility assumption (the middle assumption, labelled F2 by the CSO) and two migration assumptions. This gives us two sets of projections, as opposed to the six that the CSO present. For the purposes of presentation, we will focus first on what we will call M2F2, where the following assumptions hold.

Mortality: As would be expected, the CSO assume that mortality rates will decrease based on international experience and recent trends. The specific rate of increase is derived in the following way – it is assumed that the rate of improvement of mortality rates observed between 1986 and 2002 is maintained out to 2035. This implies that a life expectancy for men of 82.5 years in 2035 and for women of 86.9 years. (The corresponding figures for 2002 were 75.1 years for men and 80.3 years for women).

Fertility: The total fertility rate is assumed to decrease to 1.85 by 2011 and to remain constant thereafter. This assumption is based on several factors, including the increased educational attainment and labour force participation of women that are expected to exert downward pressure on fertility. The CSO label this assumption F2.

Migration: Migration is the most uncertain factor affecting the population. It tends to be much more variable than the other components of population change and a failure to foresee the rapid inflow of recent years meant that projections from the earlier part of this decade generally underestimated the recent growth in Ireland's population. With this qualification in mind, the following two assumptions for migration are used. The first assumption for migration (M1) is that immigration continues at a high level and then moderates. In particular, the net inflow is assumed to be 30,000 per annum out to 2016, 20,000 per annum between 2016 and 2026 and 15,000 per annum thereafter.

The second migration assumption (M2) sees immigration continuing but at more moderate levels. The assumed rates of net inflow are 20,000 per annum between 2006 and 2011, 10,000 per annum between 2011 and 2016 and 5,000 per annum thereafter.

The CSO (in their 2004 exercise) apply these assumptions and arrive at growth rates for the population by yearly age group and gender out to 2036. What we have done is

to take the growth rates and to apply them to the population but starting from the base year of 2006. In Table 1, we present the results in summary form for the second migration assumption (M2) so that the broad picture of Ireland’s changing population structure can be seen.

Table 1: Population projections based on CSO Migration Assumption 2

M2F2	2006	2008	2018	2028	2035
Total population	4,239,848	4,277,445	4,712,423	4,969,546	5,102,841
Number of pop over 65	467,926	485,966	668,791	904,744	1,089,967
As a percentage of total population	11.04	11.36	14.19	18.21	21.36
Number of pop over 85	48,028	50,240	67,343	98,885	149,181
As a percentage of total population	1.13	1.16	1.43	2	2.92

Looking though the table, a number of important points emerge. First, the total population is projected to grow from 4.28 million in 2008 to almost 5 million in 2028, and to continue growing to over 5.1 million in 2035. In percentage terms, this implies a growth rate of 16.2 percent between 2008 and 2028 and of 19.3 percent between 2008 and 2035.

While these figures are interesting, it is the change in the age structure of the population that shows the more dramatic trends. Currently, just over 11 percent of Ireland’s population is aged over 65 and, as such, Ireland does not yet share many of the age-related challenges facing other European governments. However, what is clear from the table is that this situation will change quite substantially over the next twenty years and beyond. In terms of numbers, the population aged over 65 more than double in the period out to 2035. As a proportion of the population, the over 65s will account for over a fifth of the population in 2035. For those aged over 85, the trends are even more dramatic. Their numbers will essentially treble between now and 2035.

It will be seen below that this increase in the population of older people essentially drives the projected increased in migrant worker needs. In the absence of a changing population structure, some external recruitment of healthcare workers might be needed to replace exits among Irish healthcare workers. However, the pattern that is

revealed in the projections below is of increased need in these areas as a result of population ageing. When reading the results, it should be kept in mind that we are projecting workers in both the healthcare and social care sectors. It could be that population ageing will also be associated with the rise in the use of social care relative to healthcare.

3.2 Health and Social care worker projections

The next step is to translate the population projections of Table 1 into possible demands for health and social care workers. As discussed in the Introduction, data limitations mean that we cannot analyse these two sectors separately and so we base our projections on the numbers working in both sectors, as supplied by the CSO. Our definition of healthcare and social care workers includes nurses and midwives, other health associate professionals and nurses' aids.

Arguments can be made that the rate of growth in healthcare workers will be above or below that of the population in general. For example, if productivity gains can be realised in the healthcare system, it could be that the rate of growth in healthcare employment will be below that of the population. Alternatively, if healthcare has an income elasticity of demand that is greater than one, then the future growth in healthcare employment could exceed that of the population if the income of the population is also growing. In our approach, we have not attempted to factor in either productivity growth or income elasticity effects.

Our projections for healthcare workers take account of the changing structure of the population and, in particular, the ageing of the population. We factor in the ageing dimension by drawing on a rule-of-thumb suggested by the OECD (1987) that people over the age of 65 consume four times as much healthcare as those under the age of 65. Essentially, what we do is multiply the population over 65 by four. We add this number to the population under 65 to get the number of "under 65 equivalents". One way of thinking about this concept is to imagine a population which put the same demands on healthcare but which was made up of under 65s only. We then divide the number of nurses currently employed by the number of under 65 equivalents to calculate the number of nurses per under 65 equivalent. To estimate the number of

nurses working with the under 65s, we multiply the nurses per under 65 equivalent by the population under 65. The residual number of nurses provide an estimate of the number working with the over 65s.

The assumption of a continued ratio of healthcare usage across the over and under 65s of 4:1 is controversial. An argument is often made in the literature that healthcare consumption among the over 65s tends to fall in an ageing population because of reduced morbidity. We see this as being a reasonable argument but for two reasons, we remain with the 4:1 ratio. First, recent work in Ireland suggests that the ratio of hospital usage by those aged under and over 65 is 6:1 (HIPE and NRPS Units, ESRI 2002). This means that our 4:1 ratio may be conservative. Second, with falling family sizes and increased female labour force participation, it is likely that the amount of family-based care will decline and that this will be replaced by market-based care. We have not attempted to incorporate this into our analysis. Given that these two factors would tend to increase the estimates of healthcare and social care needs in an ageing population, their omission from our analysis should counterbalance the omission of improved morbidity⁶.

The results of this exercise are summarised in Table 2. The first line of Table 2 shows our projections for the number of healthcare workers that will be needed out to 2035. For 2006, figures from the CSO show that there are 61,170 health and social care workers in Ireland. The 4:1 ratio implies that 20,287 of these are working with people over the age of 65 and 40,883 are working with the population under the age of 65. Given the rise in the population aged 65 and over shown in Table 1, it would be expected that we would see a large rise in the projected number of nurses working with the 65+ group and this is what we see in Table 2. By 2028, the number of health and social care workers needed for the 65+ group is 40,362. By 2035, the corresponding figure is 48,516. The growth in the number of nurses working with the under 65s is much lower and, again, this is unsurprising given the population projections.

⁶ This 4:1 ratio approach in projecting healthcare demand has been used by Barrett and Bergin (2005) and by Barrett et al (2007)

Table 2: Projections for Healthcare workers, 2006-2035, under migration assumption 2

M2F2	2006	2008	2018	2028	2035
Total number of Health Care workers	61,170	63,166	73,843	84,354	91,889
projected number of Health Care workers working with over 65's	20,287	21,,625	29,896	40,362	48,516
Projected Health Care workers working with under 65's	40,883	41,541	43,947	43,992	43,373
Extra number of Health Care workers for total pop relative to 2006	0	1,996	12,673	23,184	30,719
Extra number of healthcare workers for older pop relative to 2006	0	1,338	9,609	20,075	28,229

In total, our projections suggest that the number of health and social care workers in Ireland will rise from 61,170 in 2006 to 84,354 in 2028 and to 91,889 in 2035. These figures translate into a growth of 38 percent in health and social care worker numbers by 2028 and of 50 percent by 2035. As shown in Table 2, in terms of numbers of workers, our projections suggest that an extra 23,184 health and social care workers will be employed by 2028 and an extra 30,719 by 2035 for the total population, while an extra 20,075 health and social care workers will be needed by 2028 in the older adult care sector and an extra 28,229 by 2035. This represents an almost 100% increase by 2028 and 140% increase by 2035.

3.3 National/non-national split

Our next task is to provide some indication of how the extra workers will be distributed by Irish-born and foreign-born employees. We take two approaches to the issue. As will be seen, the two approaches can be seen as providing upper and lower bound estimates of the numbers of migrant workers.

Our first approach (which we label S1 or Scenario 1) is to take the current split between Irish and foreign-born workers in the sector and to assume that this ratio will continue to hold out to 2035 for the population as a whole. Figures from the CSO

show that the national to non-national ratio in the sectors under discussion for the total population is 83.5% national to 16.5% non-national⁷. However from

In our second approach (which we label S2 or Scenario 2) we keep the amount of Irish health care workers in 2006 constant and all new healthcare workers are assumed to be foreign national. Clearly both scenario's are extremes and, as mentioned already, the demand for new migrant workers is more likely to lie somewhere between the two.

The results from our projections of the split between national and non-national health and social care workers are shown in Table 3. Under Scenario 1 (were the current national/non-national split is maintained out to 2035), A total of 15,180 migrant workers would be needed by 2035 for the total population. In percentage terms, this would imply an increase in the number of foreign worker of around 50 percent from 2006. As this would occur over a thirty year period, it would not be an overly dramatic development.

The picture looks somewhat different however, when we look at Scenario 2, i.e., the situation in which all the additional health and social care nurses are foreign. Now we find that 40,824 migrant health care workers would be needed in total by 2035; for 2028, the figure is 33,289. With just over 10,000 foreign health and social care workers employed in Ireland currently, these figures suggest that the number would have to increase by 200 percent out to 2028 and by 300 percent out to 2035. As can be seen from the table, the vast bulk of the extra nurses would be needed for the population over 65.

⁷ Other sources suggest that a higher proportion of healthcare workers may be foreign. For example, according to the Irish Nursing Board 21 percent of nurses are foreign. In addition, a study undertaken by ICSG found that there was a higher concentration of migrant care workers working with the over 65's than for the sector as a whole; the ratio reported was 31.6% non-national to 68.4% national for the older adult care sector. As the figure we are using is at the lower end of range, our results can be viewed as providing a lower bound estimate of the current and future demand for foreign healthcare workers.

Table 3: Projections of extra foreign-born Health and Social care workers, 2006-2035 (low inward migration assumed (M2))

M2F2	The Two Scenarios	2006	2008	2018	2028	2035
S1	Number (stock) of migrant health care workers for total population	10,105	10,435	12,199	13,935	15,180
S 2	Number (stock) of migrant health care workers needed for total population	10,105	12,101	22,778	33,289	40,824
S 1	Total number (stock) of migrant workers for older population	6,411	6,834	9,447	12,754	15,331
S 2	Total number (stock) of migrant workers for older population	6,411	7,749	16,020	26,486	34,640
S 1	Extra migrant health care workers older population	0	423	3,036	6,344	8,920
S 2	Extra migrant health care workers older population	0	1,338	9,609	20,075	28,229

3.4 An alternative set of projections

It is usual in exercises such as this to consider alternative sets of population assumptions/projections. We will do so here but will only look at one additional assumption, namely, the CSO assumption of larger inflows (M1), outlined above. It is clear from the projections above that the change in the population over the age of 65 is the main driver of our results and so alterations to the mortality assumption (and the addition of morbidity assumptions) would have more of an impact on the results presented above. However, the CSO only present one mortality assumption (discussed above) and so we are limited to that one assumption.

We will not present the full set of projections for population and health and social care workers again but instead will look at the implications for our projections of the number of foreign health and social care workers needed. As such, Table 4 replicates Table 3 but is based on the assumption of larger population inflows.

Table 4: Projections of extra foreign-born Health and Social care workers, 2006-2035 (high inward migration assumed (M1))

M1F2	The Two Scenarios	2006	2008	2018	2028	2035
S1	Number (stock) of migrant health care workers	10,105	10,486	12,639	14,788	16,302
S 2	Number (stock) of migrant health care workers	10,105	12,409	25,444	38,453	47,616
S 1	Total number (stock) of migrant workers for older population	6,411	6,842	9,535	12,973	15,690
S 2	Total number (stock) of migrant workers for older population	6,411	7,775	16,299	27,179	35,777
S 1	Extra migrant health care workers older population	0	431	3,125	6,563	9,280
S 2	Extra migrant health care workers older population	0	1,364	9,888	20,768	29,366

As the population projections under-pinning Table 3 are based on the CSO assumption of larger inflows (M1), the numbers of social care workers needed increases under this assumption⁸. Hence, we can see that in total we need 47,616 migrant health and social care workers will be needed by 2035 under Scenario 2, as opposed to a total of 40,824 migrant health and social care workers under the lower migration assumption (CSO M2). The total number of migrant health and social care workers approaches the 50,000 mark by 2035 under these assumptions and so an increase of almost 400 percent is being projected.

3.5 Assessment

Exercises that seek to project outcomes twenty and thirty years hence are likely to be inaccurate due to the complex realities of the world that we live in. Hence, the projections above should not be seen as forecasts. However, they can be viewed as possible outcomes given the set of assumption that we have set out. Under these assumptions, we have show how the number of migrant health and social care workers needed in Ireland could rise by between 23,000 (23184) and 28,000 (28348) out to 2028 (if all extra workers are foreign) and by between 31000 (30719) to 37,500 (37511) out to 2035 (again, if all extra workers are foreign). Were these outcomes to

⁸ It should be noted that the population is projected to rise to over 5.6 million under the assumption of larger inflows, compared to 5.1 million under the lower inflow assumption.

be realised, a number of issues would arise. Some of these will be addressed in the concluding section below.

Section 4: Summary and conclusions

The ageing of the population will be the driving force behind the increased demand for health and social care workers in the future. Additional demand for migrant workers will not only arise from an ageing of the population, but also due to a change in the role families will play in caring for older people in the future. Caretaker potential is declining in the Irish population making it less likely that families will be able to continue caring in the way they have done for decades. Even if there is a continuous supply of Irish born health and social care workers, Ireland will undoubtedly rely on the support of foreign-born health and social care workers in the future.

Efficient recruitment of migrant health care workers will be key to maximise the benefits that immigration of health and social care workers will bring to Ireland in meeting labour shortages, due to increased demand for care of the elderly. The upgrading of the immigration system and forging mutually beneficial relationships with countries like the Philippines will enable Ireland to source foreign born health and social care workers to sectors such as long-term health care for the elderly. More work will be necessary to ensure that migrant nurses are integrated into the health system, including language training and information on customs/procedures used in the Irish health sector. Cultural differences will also have to be mediated through education and training of migrants and the recipients of care. Attitudes to migrant workers among the general public are also important. Poor attitudes will make it more difficult to retain and attract other migrant workers to come to Ireland if the perceived image is one of discrimination and prejudice.

Our projections suggest that there may need to treble the number of foreign nurses in Ireland in the period up to 2035. While the numbers are large, the discussion in Sections 1 and 2 suggest that such inflows are feasible. Ireland is already involved in external recruitment of nurses and has altered its immigration rules to assist in the process. It also has in place systems for assessing the qualifications of foreign nurses

and systems for adapting qualification, when needed. Many other countries also rely on foreign nurses and so the foreign-based approach to meeting human resource needs in the healthcare sector seems to be well established.

For these reasons, any constraints on the foreign recruitment of nurses are unlikely to arise for domestic institutional reasons. Instead, the constraints may come for external sources. We envisage the following three possibilities.

First, as all European economies are experiencing population ageing, Ireland will have to compete with other countries to an increasing extent for foreign nurses. This of course may also push up wages, thereby exerting pull factors on indigenous workers.

Second, as developing economies achieve higher levels of income, the “push factors” associated with migratory outflows may diminish.

Third, and possibly of greater significance, the ethical discussion around the appropriateness or otherwise of recruiting nurses from developing countries is likely to persist.

Generally, however, we expect demand for migrant workers in the health and social care sector to remain strong in Ireland. A significant investment in education and training will be necessary to ensure an orderly and sustained integration of migrant workers into the health and social care system. Attention will also have to be paid to quality of care issues which may arise from cultural differences between migrant providers and domestic recipients of care, particularly in respect of the care of older people. These issues can be overcome, but will require a more active integration of migration policy and ageing policy than has hitherto been the case.

References

Barrett, A. and D. Duffy, (2008), “Are Ireland’s Immigrants Integrating into its Labour Market?”, *International Migration Review* Vol. 42 No. 3.

Barrett, A. and Y. McCarthy (2007a), “Immigrants in a Booming Economy: Analysing their Earnings and Welfare Dependence”, *Labour*, Vol. 21 No. 4-5

Barrett, A. and Y. McCarthy (2007b), “The Earnings of Immigrants in Ireland: Results from the 2005 EU Survey of Income and Living Conditions”, *Quarterly Economic Commentary*, Winter.

Barrett, A., A. Bergin and Y. McCarthy (2007), “A Fiscal Window of Opportunity? Projecting Public Spending out to 2020”, (2007), in Callanan, Mark (ed.) *Ireland 2022: Towards One Hundred Years of Self-Government*, Dublin: Institute for Public Administration.

Barrett, A., A. Bergin and D. Duffy (2006), “The Labour Market Characteristics and Labour Market Impacts of Immigrants in Ireland”, *Economic and Social Review* Vol. 37 pp. 1-26.

Barrett, Alan and Bergin, Adele (2005), “Assessing Age-related Pressures on the Public Finances, 2005-2050”, in Callan, Tim and Aedin Doris (eds.) *Budget Perspectives 2006* (Proceedings of a conference co-hosted by the ESRI and the Foundation for Fiscal Studies, 11 October 2005), Dublin: ESRI.

Barrett, A. and F. Trace (1998), “Who is Coming Back? The Educational Profile of Returning Migrants in the 1990s”, *Irish Banking Review*, Summer pp. 38-52

Buchan, James. (2007) “Health Worker Migration in Europe: Assessing the Policy Options.” *Eurohealth 2007*; Vol 13 No 1 :6-8. Available at www.euro.who.int Accessed on January 25th 2008.

Cangiano, Alessio. (2007) “Migrant Care Workers in the UK Labour Market.” (Workshop on Human Resources For Health and Migration Mobility, Training and the Global Supply of Health Workers.) Centre on Migration, Policy and Society. University of Oxford. Available at www.migrationdrc.org/news/reports/mobility.

Clark, P.F., Stewart, J. and Clark, D. A. (2006):“The globalization of the labour market for health-care professionals.” *International Labour Review* 145 (1-2): 37-64.

Central Statistics Office, 2007. Quarterly National Household Survey. Dublin CSO.

Central Statistics Office, 2006. Population and Labour Force Projections. Dublin CSO.

Department of Enterprise, Trade and Employment, (2007). ‘Information on Employment Permits for Nurses and Doctors’. Available at <http://www.entemp.ie/labour/Workpermits/doctorsandnurses.htm>

Department of Enterprise, Trade and Employment, (2007) . ‘Information Leaflet Concerning Working Visas/Work Authorisations for Employment in Ireland’ .
[Http://www.entemp.ie/](http://www.entemp.ie/) accessed on 28th of January 2008.

Dumont, Jean-Christophe. (2007) “International Migration of Health Professionals: new evidence and recent trends.” Workshop on Human Resources For Health and Migration: Mobility, Training and the Global Supply of Health Workers.

FÁS Skills and Labour Market Research Unit, 2005. “Healthcare Skills: Monitoring Report.”
Dublin. FÁS.

FETAC (2006), “Directory of FETAC Awards” Information for candidates on type of awards available. Available at www.fetec.ie/PDF/fetac_directory_of_awards_2006/

HIPE and NPRS Unit, ESRI (2002), *Activity in Acute Public Hospitals in Ireland 1990-1999*, Dublin: ESRI

Humphries, N, Brugha, R and McGee, H, (2008) “Nurse Migration to Ireland: An Overview” Nurse Migration Project Policy Brief 1.

Humphries, N, Brugha, R and McGee, H, (2008) “Retaining Migrant Nurses in Ireland” Nurse Migration Project Policy Brief 2.

International Council of Nurses (ICN) (2004): “The inadequate supply of nurses is having a negative effect on care outcomes globally.” Press release, 8 Nov. Geneva.
http://www.icn.ch/PR13_04.htm

Irish Nursing Board, (2008) “Nursing/Midwifery, A Career for You.” Available at <http://www.nursingboard.ie/> . Accessed January 2008.

Irish Nursing Board, (2006), Register Statistics 2006. Information on the Number of Newly Registered Qualifications. Available at www.nursingboard.ie/en/statistics. Accessed on 5th of February 2008.

Irish Nursing Board, No date supplied. Information for Nurses and Midwives Educated and trained overseas, both in and outside the EU, Requirements and Standards for Registration with the Irish Nursing Board. Available at http://www.nursingboard.ie/en/reqs_stds_reg.aspx . Accessed 25th January 2008.

Minns, C. (2005), “How Skilled Are Irish Immigrants? Evidence and Implications”, paper delivered to the Statistical and Social Inquiry Society of Ireland, 24 February.

National Economic and Social Council (2006), “Managing Migration in Ireland: A Social and Economic Analysis”: A Report by the International Organisation for Migration for NESC for Ireland. Dublin.

OECD (1987), *Financing and Delivering Healthcare: A Comparative Analysis of OECD Countries*, Paris: OECD

Organisation for Economic Co-Operation and Development Health Data (2007). "How Does Ireland Compare." Available at www.oecd.org/. Accessed on November 13th 2007.

Quinn, Emma. (2006) "Managed Migration and The Labour Market- The Health Sector in Ireland." European Migration Network. ESRI: Dublin.

Ragharum, Parvati and Kofman, Eleonore (2002), "The State, Skilled Labour Markets, and Immigration: The Case of Doctors in England", *Environment and Planning A* Vol. 34 pp 2071-2089

Ruhs, M. (2005), Managing the Immigration and Employment of non-EU Nationals in Ireland, Paper No. 19, The Policy Institute, TCD

Stewart, James, Clark, Darlene and Clark, Paul F. (2007) "Migration and Recruitment of Healthcare Professionals: Causes, Consequences and Policy Responses." Focus. Policy Brief No.7. Available at www.focus-migration.de. Accessed on January 25th 2008.

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