

Getting into and staying in employment: Limiting long-term illness

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1. Introduction

There are many reasons why an individual of working age may not be in employment. The most common reasons are being in full-time education, looking after family, or having a long-term illness¹. Personal and economic circumstances will play an important role. Someone with a long-term illness may be restricted in employment opportunities due to their disability or health condition, and receipt of health-related benefits may reduce the economic necessity to gain income through employment. These circumstances can change over time, or people may change their economic activity status despite circumstances remaining the same.

The overarching aim of the research is to gain a greater understanding of the drivers for changing economic activity status between 2001 and 2011, using the Northern Ireland Longitudinal Study (NILS), a 28% sample of the population. This report focuses on those with a self-reported disability or health condition and comprises of two strands of research.

The first strand looks at the household population with a limiting long-term illness in 2001, aged between 20 and 49 years. In this group, the focus is on which drivers affect the likelihood of staying in employment or, for those who were not in employment in 2001, obtaining employment by 2011. This age cohort was chosen so that all would have finished secondary education in 2001 but would be under 60 years of age by 2011 and hence will not have reached pensionable age².

Box 1: Key findings – change in employment status

- Nearly a third (29.0%) of those aged 20 to 49 years with a limiting long-term illness in 2001 were in employment in that year.
- Of those who were in employment in 2001, nearly three-quarters (71.9%) were also in employment in 2011. The strongest factors for staying in employment were having good health, cars in the household and higher educational qualifications.
- Of those who were not in employment in 2001, around a quarter (24.4%) were in employment ten years later in 2011. Key drivers to get into employment were having recently worked, looking for work (as opposed to being economically inactive), and having higher educational qualifications.

The second strand of research assesses the disability employment gap in 2011 - the difference in the proportion of the population who are in employment between those with and without disabilities. This analysis examines the household population aged 30 to 59 years. This age cohort aligns with that of the first strand (aged 20-49 years, ten years earlier in 2001).

Published statistics from the 2001 Census show that there were 92,151 people aged 20-49 with a limiting long-term illness living in households in 2001 ([Table S016](#)). This is roughly double the 46,927 people in that same age group who were economically inactive due to being permanently sick or disabled ([Table S028](#))³. This means that there is a sizeable group of those with limiting long-term illness who are either in employment, looking for work, or economically inactive for another reason.

¹ Latest figures from HI12 Regional labour market [Headline indicators for Northern Ireland](#), published on 15 November 2022, show that out of the 314,000 people economically inactive in 2021, 29.1% were students, 16.4% were looking after family or home, and 30.7% were long-term sick (Table 23).

² The [state pension age](#) at the time of the 2011 Census was 65 years for males, and 60 years and six months for females. Some may have retired before the age of 60, however, they would not be entitled to a State Pension.

³ A small proportion of those who were economically inactive due to being permanently sick or disabled, did not have a limiting long-term illness. For those aged 16 to 74, this equated to 5.0% ([Table S021](#)).

Box 2: Key findings – disability employment gap

- The disability employment gap in 2011 was 52.3 percentage points (pps) – the difference in employment rate between those with (31.4%) and without a long-term health problem or disability (83.7%) of the household population aged 30 to 59 years.
- The disability employment gap is lowest within groups that volunteer (30.7pps), provide unpaid care (30.2 to 30.8pps) and with degree-level qualifications (33.8pps).
- A statistical modelling exercise found that general health explains around a quarter (25.7%) of the disability employment gap (13.4 out of 52.3pps). Other large contributors are educational qualifications (6.4pps) and providing unpaid care (5.6pps). The unexplained part (15.4pps) accounts for 29.5% of the disability employment gap.
- This analysis was repeated for several disabilities or health conditions. The employment gap ranges from 14.5pps for deafness or partial hearing loss, to 61.8pps for those with frequent periods of confusion or memory loss.
- The combination of general health, other health conditions and highest educational qualifications explained more than half of the employment gap for each condition except for those with an emotional, psychological or mental health condition (42.4%), which also has the largest proportion of the employment gap (31.7%) that could not be explained.

This research could be used to identify barriers associated with a failure to get into or stay in employment. This may support policy development in addressing barriers to employment for those with limiting long-term illness and target specific groups who could benefit from additional support. This research project relates directly to the previous Northern Ireland Programme for Government ‘reducing economic inactivity’ indicator, which features in two outcomes of the cross-departmental Outcomes Delivery Plan⁴: ‘*we have a more equal society*’, and ‘*we have more people working in better jobs*’. There are also angles to more general societal benefits, such as increasing the proportion of people in work, reducing poverty, increasing confidence and capability of people and communities, reducing inequalities and increasing quality of life.

The Department for Communities is responsible for developing a range of social inclusion strategies as part of the New Decade New Approach, including a [new disability strategy](#). Its aim is to tackle inequalities and obstacles that affect their everyday lives. A report from the [Disability Strategy Expert Advisory Panel](#), published in March 2021, lists employment as one of the areas of accessibility to be addressed in a new disability strategy. At a recent [international disability employment event](#), the Minister of the Department for Communities highlighted this strategy, which is being developed to deliver long-term solutions for people with disabilities to gain, retain and progress in employment.

The **disability employment gap** is a key measure of inequality and has been identified by the Disability Strategy Expert Advisory Panel. NISRA publishes estimates of the disability employment gap, based on the Labour Force Survey⁵ with a sample of around 4,000 individuals, and making comparisons over time, by age and sex, and between the UK countries. The earliest published figures relate to 2014 and show disability employment gap estimates of 43.8 percentage points (pps) for those aged 25 to 34 years, 50.7pps for 35 to 49 years, and 50.1pps for those aged 50 to 64 years. Northern Ireland had the largest disability employment gap of all four UK countries in each year 2014 to 2020, mainly due to much lower employment rates for people with disabilities.

⁴ See [Outcomes Delivery Plan](#)

⁵ See [Disability Employment Gap in Northern Ireland, 2020](#)

2. Aims and methodology

2.1. Aims of study

This study sets out to describe the population aged 20 to 49 years with a limiting long-term illness in 2001 (Section 3.1), identify drivers and quantify their impact on the likelihood of obtaining employment by 2011 (Section 3.2) and similarly for staying in employment by 2011 (Section 3.3). The research also examines key elements within the disability employment gap in 2011 (Section 3.4).

2.2. Data

The Northern Ireland Longitudinal Study (NILS) links data from the Northern Ireland Health Card Registration system to Census returns and administrative data from other sources⁶. The NILS can also be expanded and enhanced with vital events registered with the General Register Office for Northern Ireland and Health and Social Care data from administrative sources. The NILS sample is made up of roughly 28% of the Northern Ireland population based on 104 dates of birth (day and month). The value of this resource has been demonstrated by many published research projects⁷.

For this project, the overall research dataset consisted of all NILS members aged 16 to 74 in April 2001 and enumerated in either the 2001 or 2011 Census (n=319,989). This dataset was anonymised prior to access by the research team and did not contain identifiable individual level data. Access was only provided from within a controlled 'secure environment' and governed by strict [protocols and procedures](#) to ensure data confidentiality.

The first part of this study used a subset of the dataset, which included only those with limiting long-term illness in 2001, aged 20 to 49 years (n=24,509). This sample was further reduced to 23,910 by excluding those in communal establishments, for whom key characteristics were not available. This sample represents 25.9% of the published Census figure of 92,151 people with limiting long-term illness in 2001, aged 20 to 49 years and living in households ([Table S019](#)). Although this proportion is slightly lower than the 28% NILS sample, given the 92% response rate⁸ to the 2001 Census in Northern Ireland, it is an expected sample of enumerated people.

The outcome of interest was whether a person was in employment in 2011. A small number of full-time students (264) were excluded, given the forthcoming change to their qualifications and potentially related changes to other circumstances. This left a sample of 26,646 non-students aged 20 to 49 years, with limiting long-term illness and living in households. From this group, 1,086 people died before 2011 (4.6%), and a further 1,907 people left Northern Ireland or were not enumerated in the 2011 Census (8.1%). After excluding these records, the final dataset included 20,653 people.

The second part of this study used all NILS members enumerated in the 2011 Census, aged 30 to 59 years, and living in households, regardless of limiting long-term illness and whether they were enumerated in 2001. The age group was selected to align with the longitudinal analyses of people aged 20 to 49 years, ten years earlier in 2001. This sample of 190,424 people represents 26.5% of the official Census figure of 718,430 people aged 30 to 59 years living in households ([Table DC1101](#)).

⁶ See the [Northern Ireland Longitudinal Study – An Introduction](#)

⁷ Examples of recent research projects can be found at [Northern Ireland Longitudinal Study research page](#).

⁸ See page 7 of the One Number Census Guide on the [2001 Census Methodology page](#)

2.3. Measures and definitions

Variables are used to define the study sample, select the outcome of interest, and identify possible drivers for that outcome. Most variables originate from the 2001 Census, except for age and sex (health card registrations), the outcome of interest (2011 Census), and deprivation measures (MDM'05).

This study used self-reported health problem/disability, as collected in the 2001 Census in Northern Ireland, as the basis for selecting the sample. This definition is broadly consistent with the [Government Statistical Service \(GSS\) harmonised standard](#) and [Disability Discrimination Act \(DDA\) 1995 definition](#). The 2011 Census collected further information on whether activities are limited a little or a lot, as well as a range of conditions (see Box 3).

The outcome of interest for this study – being in employment in 2011 – originated from a Census question on whether the respondent carried out paid work in the previous week. This is also a [GSS harmonised standard question](#). Key elements of this question were also part of the 2001 Census, which has been used to split the study sample into those out of employment and in employment. Further details of other variables can be found in [Annex A](#).

2.4. Methodology

In the first results section of this report (Section 3.1), the population aged 20 to 49 years with a limiting long-term illness is described using individual, household, and area characteristics to identify potential drivers of being in employment in 2011. This population is split into those in employment, and those out of employment in 2001 for two reasons. Firstly, some information is only available for one group, such as the reason for economic inactivity and year last worked for those out of employment, and weekly hours of work and current occupation for those in employment. Secondly, characteristics could have a different effect in these two groups on the likelihood of being in employment in 2011.

The second and third results sections of the report use logistic regressions to describe whether individuals will be in employment in 2011. The two sections represent the split population of those out of employment (Section 3.2), and those in employment in 2001 (Section 3.3). Potential drivers for being in employment by 2011 are several explanatory variables, which were chosen based on existing literature and descriptive information (Section 3.1). Variables that appear to have a differential effect on the likelihood of being in employment in 2011 on their own may continue to be relevant after accounting for other factors. A stepwise approach was used to remove insignificant variables from the model one-by-one, until all remaining variables were significant. Further detail on this method can be found in [Annex A](#).

The final strand of analysis (Section 3.4) assesses the disability employment gap in 2011. An examination of the extent to which the disability employment gap can be explained by differences in other individual, household or area differences was undertaken using the Fairlie decomposition method⁹. This analysis creates a three-way decomposition of the disability employment gap by splitting it into (a) differences in characteristics between those with and without disabilities, (b) differences in the effects of these characteristics on employment between those with and without disabilities, and (c) unexplained differences due to other factors. Further detail on this method can be found in [Annex A](#).

⁹ The [Fairlie decomposition method](#) is an adaptation of the Blinder-Oaxaca decomposition technique for analyses where the outcome variable is binary (in this study, whether or not in employment).

Box 3: Comparison of key questions on limiting long-term illness and economic activity status between 2001 and 2011 Census

	Health	Employment	Economic inactivity	
2001 Census	<p>13 Do you have any long-term illness, health problem or disability which limits your daily activities or the work you can do?</p> <p>◆ Include problems which are due to old age.</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>17 Last week, were you doing any work:</p> <ul style="list-style-type: none"> • as an employee, or on a Government sponsored training scheme, • as self-employed/freelance, or • in your own/family business (including shop or farm)? <p>◆ ✓ 'Yes' if away from work ill, on maternity leave, on holiday or temporarily laid off.</p> <p>◆ ✓ 'Yes' for any paid work, including casual or temporary work, even if only for one hour.</p> <p>◆ ✓ 'Yes' if you worked, paid or unpaid, in your own/family business.</p> <p><input type="checkbox"/> Yes ➤ Go to 23</p> <p><input type="checkbox"/> No ➤ Go to 18</p>	<p>21 Last week, were you any of the following?</p> <p>◆ ✓ all the boxes that apply.</p> <p><input type="checkbox"/> Retired</p> <p><input type="checkbox"/> Student</p> <p><input type="checkbox"/> Looking after home/family</p> <p><input type="checkbox"/> Permanently sick/disabled</p> <p><input type="checkbox"/> None of the above</p>	
2011 Census	<p>22 Are your day-to-day activities limited because of a health problem or disability which has lasted, or is expected to last, at least 12 months?</p> <p>➤ Include problems related to old age.</p> <p><input type="checkbox"/> Yes, limited a lot</p> <p><input type="checkbox"/> Yes, limited a little</p> <p><input type="checkbox"/> No</p>	<p>28 Do you have any of the following conditions which have lasted, or are expected to last, at least 12 months?</p> <p>➤ Tick all that apply.</p> <p><input type="checkbox"/> Deafness or partial hearing loss</p> <p><input type="checkbox"/> Blindness or partial sight loss</p> <p><input type="checkbox"/> Communication difficulty (a difficulty with speaking or making yourself understood)</p> <p><input type="checkbox"/> A mobility or dexterity difficulty (a condition that substantially limits one or more basic physical activities such as walking, climbing stairs, lifting or carrying)</p> <p><input type="checkbox"/> A learning difficulty, an intellectual difficulty, or a social or behavioural difficulty</p> <p><input type="checkbox"/> An emotional, psychological or mental health condition (such as depression or schizophrenia)</p> <p><input type="checkbox"/> Long-term pain or discomfort</p> <p><input type="checkbox"/> Shortness of breath or difficulty breathing (such as asthma)</p> <p><input type="checkbox"/> Frequent periods of confusion or memory loss</p> <p><input type="checkbox"/> A chronic illness (such as cancer, HIV, diabetes, heart disease or epilepsy)</p> <p><input type="checkbox"/> Other condition</p> <p><input type="checkbox"/> No condition</p>	<p>29 Last week, were you:</p> <p>➤ Tick all that apply.</p> <p>➤ Include any paid work, including casual or temporary work, even if only for one hour.</p> <p><input type="checkbox"/> working as an employee? ➤ Go to 35</p> <p><input type="checkbox"/> on a government sponsored training scheme? ➤ Go to 35</p> <p><input type="checkbox"/> self-employed or freelance? ➤ Go to 35</p> <p><input type="checkbox"/> working, paid or unpaid, for your own or your family's business? ➤ Go to 35</p> <p><input type="checkbox"/> away from work ill, on maternity leave, on holiday or temporarily laid off? ➤ Go to 35</p> <p><input type="checkbox"/> doing any other kind of paid work? ➤ Go to 35</p> <p><input type="checkbox"/> none of the above</p>	<p>33 Last week, were you:</p> <p>➤ Tick all that apply.</p> <p><input type="checkbox"/> retired (whether receiving a pension or not)?</p> <p><input type="checkbox"/> a student?</p> <p><input type="checkbox"/> looking after home or family?</p> <p><input type="checkbox"/> long-term sick or disabled?</p> <p><input type="checkbox"/> other</p>

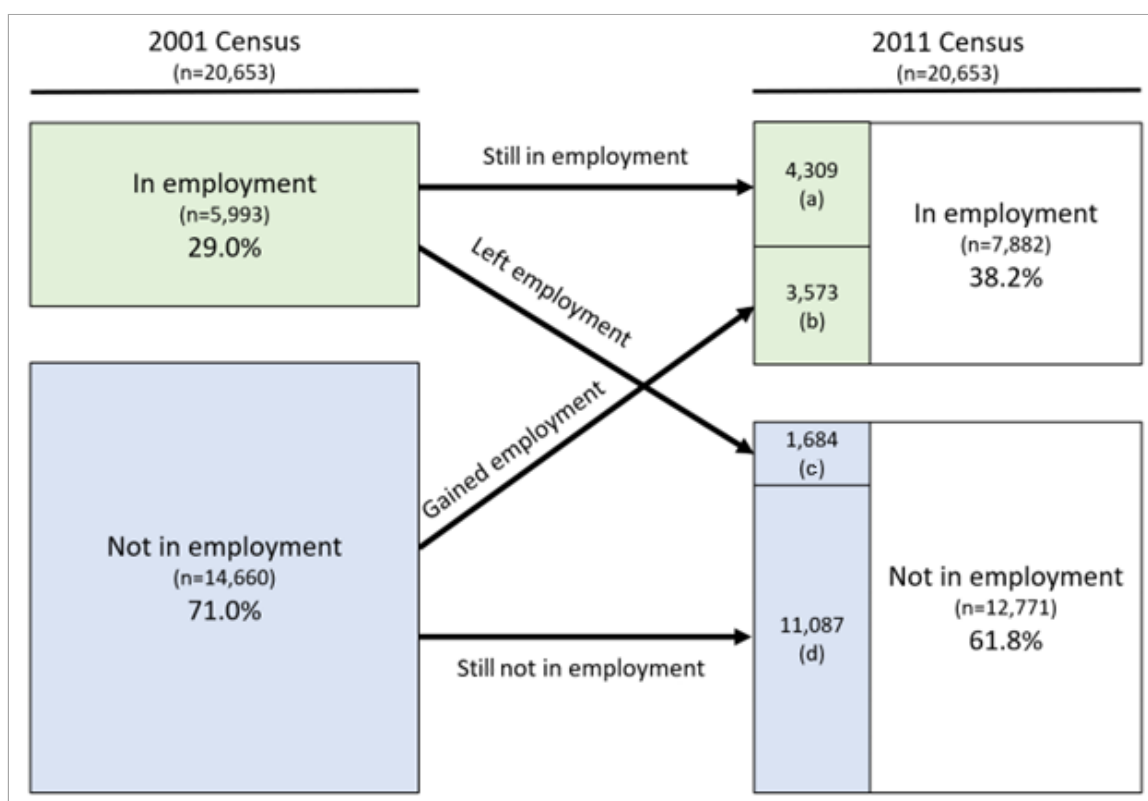
3. Results

3.1. Population with limiting long-term illness in 2001

The final dataset for this study – a sample of enumerated people in the 2001 Census – included 20,653 people, of whom 5,993 people (29.0%) were in employment in 2001 (See Figure 1). By 2011, more people with limiting long-term illness in 2001 gained employment by 2011 (n=3,573) compared to those who left employment by 2011 (n=1,684). By 2011, of those with limiting long-term illness in 2001, aged 20 to 49 years and living in households, 38.2% were in employment in 2011. Whilst there was an increased employment rate in this group between 2001 and 2011, there may have been a net loss of employment for those without a limiting long-term illness in 2001, for example, due to worsening health in this ten-year period. This is outside the scope of this report.

Around a quarter (24.4% or 1,684 out of 5,993 persons) of those who were not in employment in 2001, were found to be in employment ten years later in 2011. Also, of those who were in employment in 2001, nearly three-quarters (71.9%) were also in employment in 2011.

Figure 1: Household population with limiting long-term illness in 2001, aged 20 to 49 years, by employment status in 2001 and 2011



[Annex B](#) provides a description of the study population by individual, household and area characteristics, alongside the proportion of this population who were in employment in 2011, split between those in work and those out of work in 2001.

Key factors that make both getting into work and staying in work more likely, as found from this research study, are:

- Being male;
- Being younger;
- Having good general health;
- Having high educational qualifications;
- Where the current or last occupation was non-manual;
- Having dependent children in the household;
- Having one or more cars in the household;
- Living in an owner-occupied household;
- Living in a rural area (compared to urban areas); and
- Living in less deprived areas.

For those not in employment in 2001, having been in employment recently (2000 or 2001) increases the likelihood of being in employment in 2011 (42.1%). Being unemployed in 2001 – did not do paid work in the previous week, was actively looking for work and able to start within two weeks – makes individuals most likely to be in employment in 2011 (41.1%); being economically inactive due to long-term sickness or disability in 2001 makes individuals least likely to be in employment in 2011 (20.7%, see [Annex B](#)). This proportion is higher than that found using the Scottish Longitudinal Study (Popham and Bambra, 2008¹⁰), where 12.9% of those aged 25 to 49 years who were economically inactive due to sickness or disability in 1991 in Scotland, moved into employment by 2001. This difference may be due to several reasons including comparing different countries and differences in age groups and time periods. Popham and Bambra also found a higher proportion moving into employment for younger people, those who previously held a non-manual job, and held a higher qualification¹⁰.

Those working part-time in 2001 (67.6%) were less likely to be working in 2011 compared to those working full-time in 2001 (73.4%). It is possible that the severity or nature of the health condition was the reason for working part-time in the first place. Furthermore, of those with a limiting long-term illness in 2001, 50.1% of those who worked part-time in 2001 stated that their day-to-day activities were limited a lot in 2011, compared to 40.7% of those who worked full-time in 2001. Having a non-manual job (73.6%) also increases the likelihood of staying in employment compared to having a manual job (69.3%)

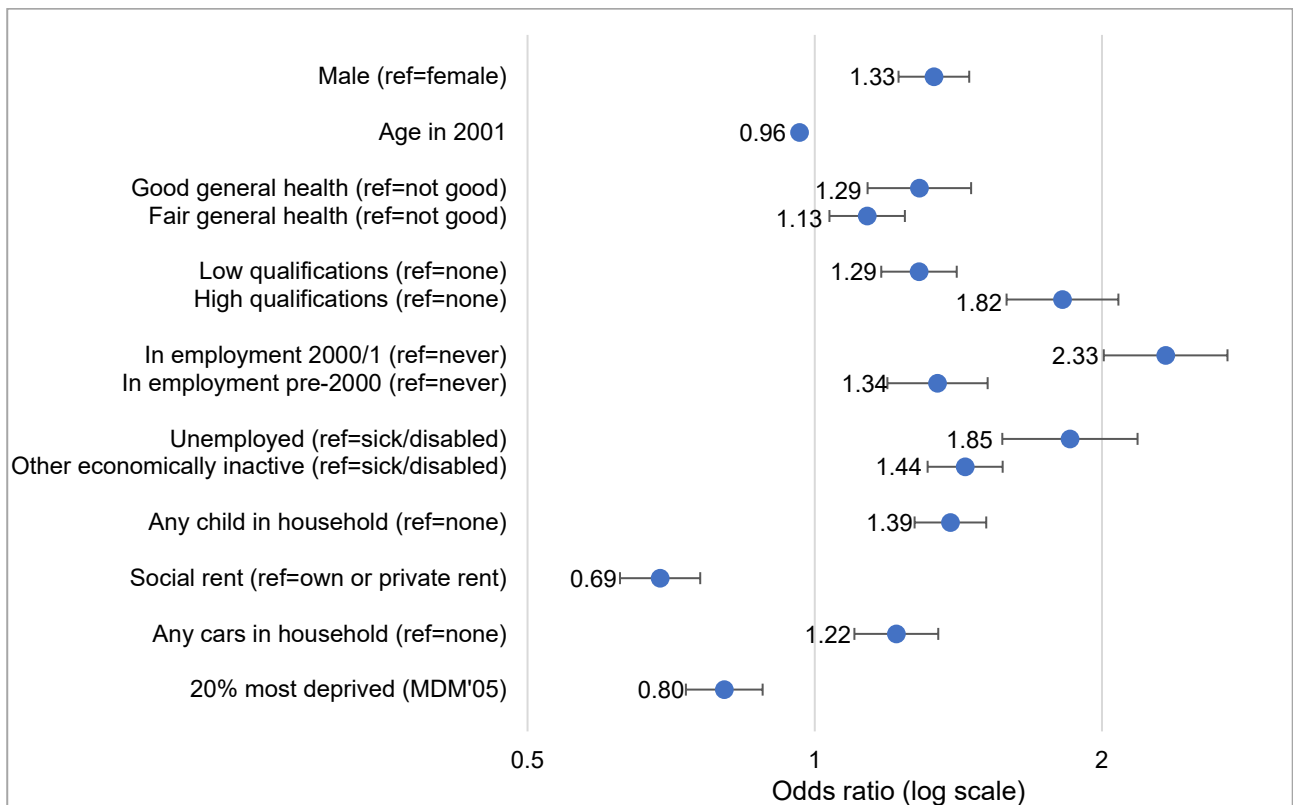
There are complex associations between characteristics, which make it difficult to attribute increased likelihood of employment in 2011 to a single variable. For example, those with higher educational qualifications tend to have non-manual occupations, and those who deem their general health not good may be more likely to state their sickness or disability as the reason for being economically inactive. The next two sections examine separately those in work and those out of work in 2001, to identify and quantify the key drivers to staying and entering employment respectively.

¹⁰ Popham, F. and C. Bambra (2008). [Movement from ill health related economic inactivity into employment and its impact on health: evidence from the Scottish Longitudinal Study](#). Scottish Longitudinal Study (SLS) Research Working Paper 1.

3.2. Getting into employment

The previous section highlighted some characteristics that have a differential effect on the likelihood of being in employment in 2011. This section looks at those who were out of employment in 2001 (14,660 people) and uses logistic regression to identify the significant drivers and their impact on the likelihood of being in employment in 2011. The model quantified the likelihood of being in employment in 2011 and incorporated all variables mentioned in Section 3.1 and listed in Annex B; insignificant variables were removed in a stepwise fashion. Figure 2 shows a visual presentation of the estimated odds ratios and their confidence intervals from the multivariate logistic regression. Full details can be found in Table C.1 of [Annex C](#).

Figure 2: Odds ratios for being in employment in 2011 for household population with limiting long-term illness and not in employment in 2001, aged 20 to 49 years



OR>1 increased likelihood of getting into employment
 OR < 1 decreased likelihood of getting into employment

The odds ratios (OR) from Figure 2 reflect the odds that a person will be in employment in 2011 given a particular characteristic in 2001, compared to the odds of the reference category. For example, the odds of being in employment in 2011 is 33% higher for males (1.33) compared to females (reference). Age is a continuous variable in this model: an odds ratio of 0.96 means that for each extra year of age, the odds of being in employment falls by 4%.

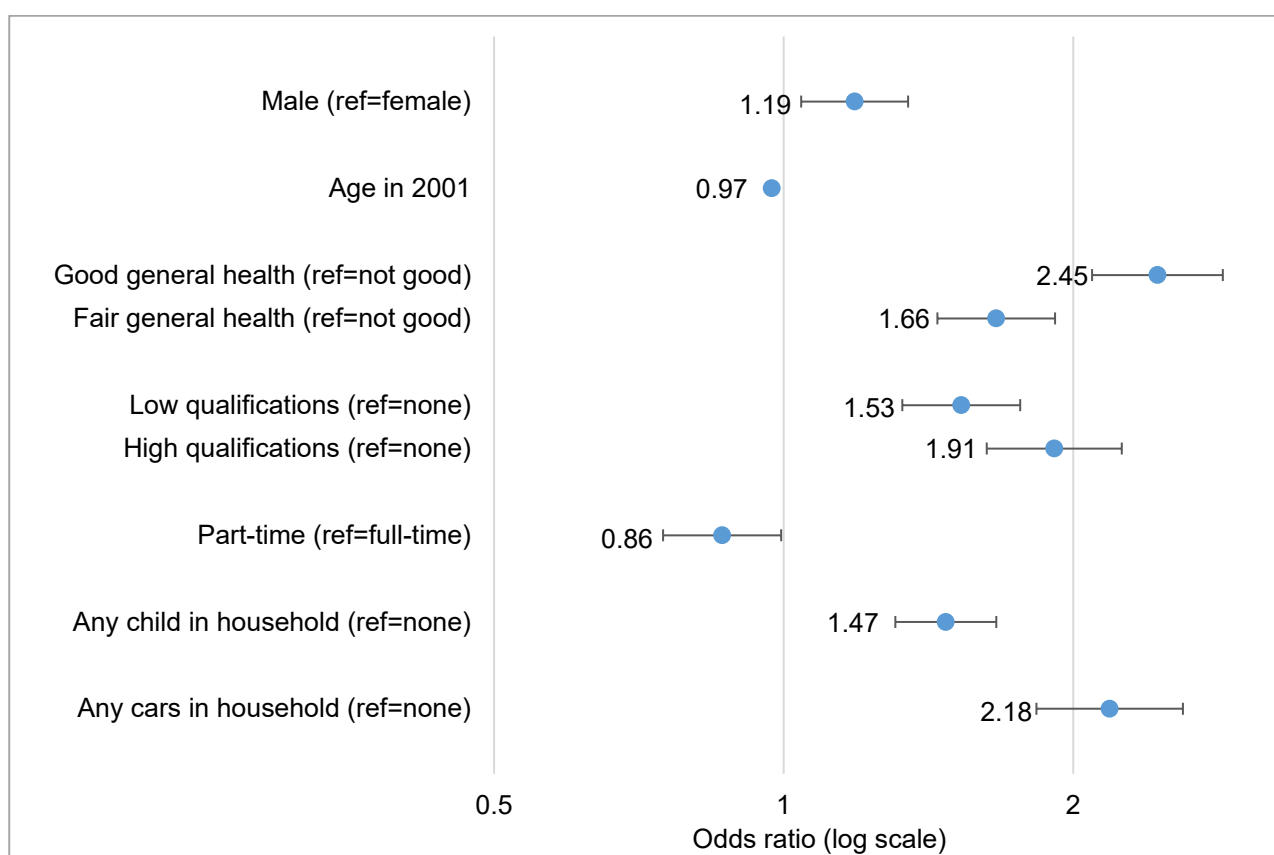
The largest odds ratios – that is, characteristics with the greatest positive effect on the likelihood of being in employment compared to their reference group – are found for those recently in employment (2.33). Other large odds ratios were estimated for being unemployed (looking for work and able to start within two weeks) and having high educational qualifications (at least two A levels or equivalent).

Living in social rented accommodation and/or the 20% most deprived areas had a negative effect on the likelihood of being in employment in 2011, even after accounting for age, sex, general health, education and employment history. Provision of unpaid care, previous occupation and urban/rural residence were removed due to an insignificant effect on the likelihood of being in employment in 2011 after adjusting for the remaining variables in the final model.

3.3. Staying in employment

This section examines those who were in employment in 2001 (5,993 people) and assesses how their circumstances in that year impacted on the likelihood of being in employment in 2011. Again, logistic regression was used to identify the significant drivers and estimate their impact; insignificant variables were removed in a stepwise fashion. Figure 3 shows a visual presentation of the findings. Full details can be found in Table C.2 of [Annex C](#).

Figure 3: Odds ratios for being in employment in 2011 for household population with limiting long-term illness and in employment in 2001, aged 20 to 49 years



OR > 1 increased likelihood of getting into employment
 OR < 1 decreased likelihood of getting into employment

For those in employment, the strongest factor for staying in employment is having good general health in 2001 (2.45). Note that some limiting long-term health conditions could be less severe or well managed with medication (asthma) or lifestyle choices (diabetes), so that such individual would still deem their general health to be good. Other strong factors were having cars in the household (2.18) and having high educational qualifications (1.91). Other factors increasing the likelihood of remaining in employment were living with dependent children (1.47) and being male (1.19).

The estimates parameter for age (0.97) suggests that for each extra year of age, the odds of being in employment falls by 3%. Working part-time also reduces the likelihood of being in employment. It is not possible to ascertain if working part-time is a direct consequence of the limiting long-term condition. However, those working part-time in 2001 were more likely to report day-to-day activities being limited a lot in 2011 (28.1% vs. 23.6%), and more likely to report a health condition or disability as the reason for economic inactivity (53.0% vs. 45.6%) compared to those working full-time. Provision of care, occupation, tenure, urban/rural, and deprivation did not have a significant effect on the likelihood of staying in employment.

A direct comparison of the separate getting into and staying in employment models is limited due to differences in the populations and the different variables included in each of the final models. However, some useful insights can be gained from looking into the different factors and their effect on getting into and staying in employment. Household tenure and deprivation were significant factors for getting into employment, but not for staying in employment by 2011. At the same time, car ownership appears to have a larger effect on staying in work (OR: 2.18) compared to getting into work (OR: 1.22). These three variables – car ownership, tenure and deprivation – may represent a single driver that captures social disadvantage for being in work in 2011.

General health in 2001 also seems to have a stronger effect on staying in work than getting into work by 2011 for both good general health (OR: 2.45 vs. 1.29) and fair general health (OR: 1.66 vs. 1.13) compared to poor general health. It may be possible that the severity of the health condition or disability for those not in employment in 2001 was in part captured by the economic activity status, particularly those who were economically inactive due to ill health.

3.4. Disability employment gap in 2011

The analysis of the disability employment gap in 2011 used a larger dataset of those NILS members who were aged 30 to 59 years and living in households according to the 2011 Census. This sample of 190,424 people included 36,295 people (19.1%) who reported that their day-to-day activities were limited a little or a lot due to a long-term health condition or disability (from here on, disability). The size of the sample is much larger than those of the earlier analyses and the Labour Force Survey (source used to produce official statistics on the disability employment gap in Northern Ireland). This allowed for a more comprehensive assessment of disability employment gaps within sub-groups.

The disability employment gap – the difference in employment rate of those without (83.7%) and those with a long-term health problem or disability (31.4%) – was 52.3 percentage points (pps). This is in line with the published 2014-2020 trend in the disability employment gap for those aged 25 to 64 based on the Labour Force Survey¹¹. The disability employment gap was smaller for those whose day-to-day activities were limited a little (32.9pps) and larger when limited a lot (66.8pps) compared to those whose day-to-day activities were not limited. [Annex D](#) provides descriptive statistics of the study sample, including disability employment gaps for sub-samples.

¹¹ See [Disability employment gap in Northern Ireland, 2020](#) and [Annex A](#)

Some of the key findings for the disability employment gap were:

- The disability employment gap is larger for males (53.3pps) than females (51.1pps). These figures were derived by calculating the difference in employment rates between those with and without disability for males (87.4% vs. 34.1%) and females (80.2% vs. 29.1%);
- The gap increased with age from 46.9pps for ages 30-34 years to a peak of 53.5pps for ages 50-54 years – these findings on age and sex are supported by published Official Statistics on the disability employment gap using the Labour Force Survey;
- The gaps within the same level of general health – good (28.4pps), fair (34.3pps) and not good (33.4pps) – are markedly lower than the overall gap (52.3pps);
- The gap for those with no qualifications (50.0pps) is higher than that for those with a degree-level or higher qualification (33.8pps). The higher the qualifications, the smaller the disability employment gap;
- Gaps for those who provide unpaid care or volunteer are around 30pps: the ability to do such unpaid work may indicate a physical and/or mental capacity to carry out paid work;
- Similarly, gaps also fall with increases in the number of dependent children, from 55.2pps for households without dependent children to 43.3pps for households with three or more children;
- Gaps are lower for households with multiple cars (40.5pps) and higher property value; and
- The disability employment gap is larger in urban settlements (54.3pps) than rural areas (48.1pps).

Cross-sectional multivariate logistic regression was used to isolate the effects of study characteristics on being in employment in 2011. Separate regressions were carried out for those with and without a disability, as well as a combined sample. Key variables in determining likelihood of being in employment in 2011 remained the same as earlier longitudinal 2001-11 analyses: general health, educational qualifications, tenure and car availability had large impacts for both those with and without a disability. Full results are reported in [Annex E](#).

The results from these regressions informed the decomposition of the disability employment gap. Figure 4 provides a simplified visual representation of the decomposition of the disability employment gap.

The overall disability employment gap is 52.3pps (83.7% minus 31.4%). Figure 4 shows, for example, that educational qualifications account for 6.4pps or 12.3% of the disability employment gap. [Annex E](#) shows that for both those with and without a disability, the higher the qualification, the more likely it is to be in employment. However, individuals with a disability are over-represented amongst those without qualifications, and under-represented amongst those having higher qualifications (see [Annex D](#)). If there was an equal distribution of qualification for those with and without a disability, and qualifications had an equal effect on the likelihood of being in employment for both groups, then the disability employment gap would be 6.4pps smaller.

Figure 4: Employment rate for those with (31.4%) and without disability (83.7%), and components of the disability employment gap (52.3pps), household population aged 30 to 59 years (2011)

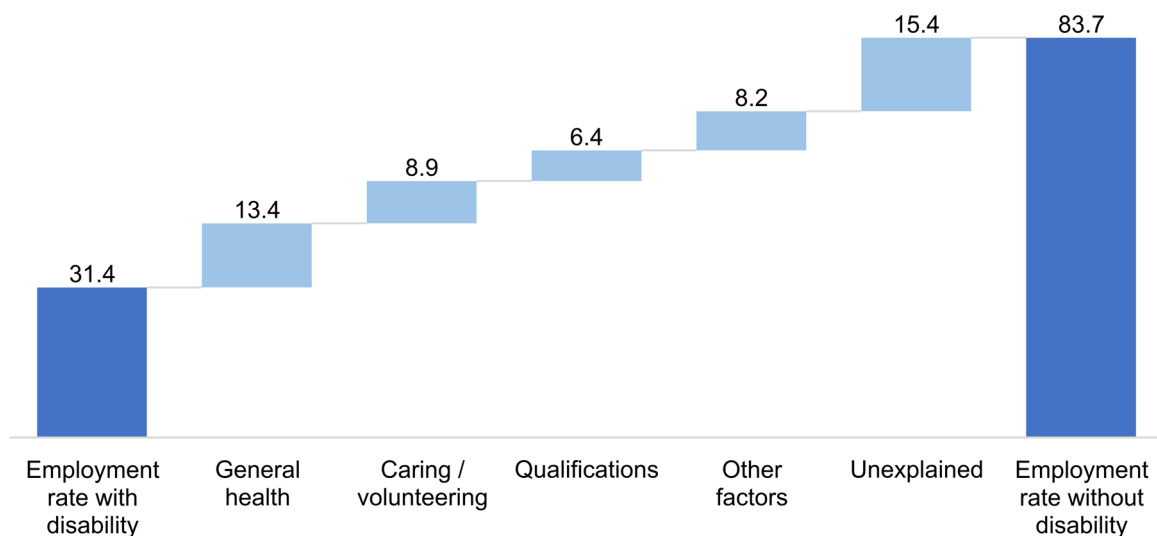


Table 1 shows a further decomposition into the variables used in the modelling, and the mechanism through which they affect the disability employment gap. It distinguishes between differences in characteristics between those with and without a disability (column A) and differences in their effect between those with and without a disability (column B).

Table 1: Proportion of disability employment gap in 2011 due to difference in characteristics and effects, by explanatory variable

Variable	(A)	(B)	(C)
	Difference in characteristics (pps)	Difference in effects (pps)	Combined (pps)
General health	16.1	-2.6	13.4
Qualifications	6.3	0.1	6.4
Providing unpaid care	0.5	5.1	5.6
Number of cars	3.2	0.9	4.1
Tenure	3.5	0.4	3.9
Volunteering	0.5	2.7	3.3
Family structure	1.2	-0.8	0.4
Sex	0.2	0.0	0.2
Number of dependent children	-1.0	1.1	0.1
Age	1.8	-2.0	-0.2
Settlement	0.0	-0.3	-0.3
Total	32.3	4.6	36.9

Looking again at qualifications, the overall effect (6.4pps) was mainly the result of differences in educational attainment, with the impact of qualifications on likelihood of being in employment being broadly similar for those with and without a disability. Another example of interpreting this decomposition for volunteering is presented in Box 4.

Box 4: Example of decomposition – Volunteering

Volunteering has a positive but small impact on being in employment with an odds ratio of 1.071 ([Annex E](#)). As 13.1% of people who volunteer have a disability – lower than the population as a whole (19.1%, see [Annex D](#)) – the difference in volunteering between those with and without disabilities explains a small proportion of the disability employment gap (0.5pps in Table 1). Whilst volunteering has a positive impact on being in employment for those with a disability (odds ratio of 1.620, see [Annex E](#)), for those without a disability it has a negative effect (odds ratio of 0.943, i.e., employment rate is higher for those who do not volunteer). If the effect of volunteering on being in employment for those with disability was the same as that for those without disability – that is volunteering reduces the likelihood of being in employment – then with proportionally fewer people with a disability volunteering, it would reduce the disability employment gap further by 2.7pps (Table 1).

Some of the values in Table 1 are negative. This occurs when characteristics with a positive (negative) impact on employment are over (under) represented or have a larger (smaller) effect for people with disabilities compared to those without disabilities.

Components due to differences in characteristics (column A) show the impact on employment for people with a disability if they would have been equally represented in each category of a variable. For instance, health generally deteriorates with increasing age, therefore people with a disability would be generally older than those without a disability. If the age distribution of people with a disability was identical to that of those without a disability, then the disability employment gap would have been 1.8pps smaller. Components due to differences in effects (column B) show how a certain characteristic can have a different impact on the likelihood of being in employment between those with and without disabilities. The largest component was due to differences in general health, as relatively few with disabilities report their general health as ‘good’, and relatively few without disabilities report their general health as ‘not good’. This component makes up 16.1 percentage points or 30.7% of the disability employment gap. This is followed by differences in qualifications (6.3pps), particularly at degree level. Other large components are tenure (3.5pps) and number of cars (3.2pps), which both could be regarded as an indicator of wealth. However, care should be taken when postulating causality: being in employment may have provided the financial means towards home and car ownership.

Having dependent children in the household is the only variable that would widen the disability employment gap, as a combined effect of (a) reducing the likelihood of being in employment, and (b) people with disabilities are less likely to have dependent children. The widening impact of differences in characteristics (-1.0pps) is countered by a tightening due to differences in effect (1.1pps).

Some variables have a larger effect, either more positive or less negative, on the likelihood of being in employment for those with disabilities compared to those without disabilities (column B of Table 1). The largest positive effect was found for the provision of unpaid care (5.1pps). Some variables have a negative effect: general health (-2.6pps), age (-2.0pps), position in family household (-0.8pps) and settlement (-0.3pps). This is often caused by one category within a variable having the positive effect on being in employment is larger for those with disabilities than that category for those without disabilities. Further detail is provided in [Annex F](#).

Table 1 shows that differences in characteristics between those with and without disabilities explain 32.3 out of the 52.3 percentage point difference, or 61.7% of the disability employment gap. The differences in effects of the characteristics between those with and without disabilities makes up a further 4.6pps or 8.8% of the disability employment gap, leaving 15.4pps out of 52.3pps (29.5%) of the disability employment gap unexplained by the selected variables. Note that this unexplained part of the disability employment gap relates to the 'average' person in the sample.

The 2011 Census also asked respondents if they had certain conditions (see Box 3 on page 7). A large proportion of those with these conditions had indicated that their day-to-day activities were impacted, ranging from 45.1% for deafness or partial hearing loss to 95.1% for mobility or dexterity difficulty (see [Annex D](#)). Employment gaps for each condition can be calculated, as well as a decomposition of those gaps by other individual, household or area characteristics. Table 2 shows the prevalence of these conditions, their employment gap, and its components that can be explained by differences in characteristics in (a) general health and other conditions, and (b) other person, household and area characteristics. A more detailed breakdown can be found in [Annex G](#).

Table 2: Employment gap in 2011 by health condition, and components explained by general health and other conditions, and other person, household or area characteristics, aged 30 to 59 years, living in households

Disability or health condition¹²	Proportion of population (n=190,424)	Raw employment gap (pps)	Explained by general health and other conditions (pps)	Explained by other characteristics (pps)
Confusion or memory loss	1.5%	61.8	25.8	26.1
Communication difficulty	1.1%	55.9	23.3	28.3
Learning or behavioural difficulty	1.4%	54.5	16.9	27.0
Mobility or dexterity difficulty	9.8%	53.4	23.3	24.2
Mental health ¹³	9.3%	51.3	16.4	18.6
Long-term pain or discomfort	11.2%	42.0	26.5	16.3
Blindness or partial sight loss	1.0%	31.9	14.3	11.7
Chronic illness	5.3%	27.7	17.1	10.4
Difficulty breathing	7.4%	25.1	16.0	10.0
Deafness or partial hearing loss	3.4%	14.5	9.2	5.2
Other health condition	5.9%	24.7	13.6	9.5

Some of these conditions have a very low prevalence and as such care should be taken when interpreting findings. The raw employment gap ranges from 14.5 percentage points for deafness or partial hearing, to 61.8 percentage points for those with frequent periods of confusion or memory loss. For several conditions, differences in general health and having other conditions accounts for more than half of the employment gap: long-term pain or discomfort, chronic illness, difficulty breathing and deafness or partial hearing loss.

The effect of health-related variables (16.9pps) is relatively small for learning and behavioural difficulty. The main driver of its employment gap is the differences in educational qualifications, which explains nearly a quarter of this gap (23.8%, 13.0pps of the 54.5pps, see [Annex G](#)). Whilst having identified the importance of this driver, it is unsure to which extent the number and level of educational qualification for those with learning or behavioural difficulty can be raised to the level of the wider population.

¹² Descriptions of health conditions are shortened versions to those in the Census questionnaire, see Box 3 on page 7.

¹³ Mental health is short for having an emotional, psychological or mental health condition. Similarly, learning or behavioural difficulty is short for a learning difficulty, an intellectual difficult or a social or behavioural difficulty.

The combined effect of general health, other conditions and highest educational qualification explain more than half of the employment gap for each condition (see [Annex G](#)). The only exception is for those with an emotional, psychological or mental health condition, where these combined variables explain 21.8pps of the 51.3pps employment gap (42.4%). This group has also the largest proportion of the employment gap that cannot be explained by differences in the selected variables and their effects (16.3ppt out of 51.3ppt or 31.7%).

4. Limitations

The study is based on a large, high-quality longitudinal dataset¹⁴ that enabled a deep and rich understanding of changes in employment status for those with limiting long-term health conditions. The study uses individual, household and area level data with a sample size (28% of the Northern Ireland population) that far exceeds any survey in Northern Ireland. Both Census coverage and its linkage rate to the NILS sample were very high and thus minimised selection bias.

Data sources could be affected by the '[justification bias](#)', where some respondents may have used illness to justify not being in employment. Black, Johnston and Suziedelyte (2017)¹⁵ found a higher proportion of respondents in the Australian Labour Force Survey reporting a disability subsequent to answering questions on employment status and welfare circumstances, compared to when asked at the beginning of the interview. This difference was larger for those who were economically inactive or unemployed (around four percentage points) compared to those in employment (1-2 percentage points). The Northern Ireland Census questionnaires have asked questions relating to health prior to those on employment status and, if applicable, reasons for being economically inactive. Whilst this may have reduced the justification effect, it is not possible to ascertain if this effect is still present. Popham and Bamba (2008)¹⁶ found that less than a third of those who went from economically inactive due to a longstanding limiting illness in 1991 to being in employment in 2001, no longer report a limiting long-term illness. The justification bias in 1991 may have been a small part of this change.

This study is restricted to two points in time associated with the Census data collection period: April 2001 and March 2011. Whilst the question on limiting long-term illness comprised a time element – has lasted or expected to last 12 months or more – the employment question related to the previous week only. For those in employment at both points in time, it is not possible to ascertain if they have been in employment continuously between 2001 and 2011.

For those not in employment in 2011, the Census asked the year last worked. This adds a third point in time between 2001 and 2011 for a subset of the population, but still without information on the duration of this work. Figure 1 showed that for the household population with a limiting long-term condition, aged 20 to 49 years and not in employment in 2001, 24.4% were in employment by 2011. A further 1,711 people (11.7%) from this group reported having worked at one point between 2001 and 2011. Similarly, of the 1,684 people who were in employment in 2001 but not in 2011, nearly a third (30.3% or 511 people) indicated that they had been working in the previous three years and therefore had left employment relatively recently.

¹⁴ Include reference regarding the quality of either NILS or the Census, for example, the [2011 Census Quality Assurance Report](#).

¹⁵ Black, N., Johnston, D. & Suziedelyte, A. (2017). [Justification bias in self-reported disability: New evidence from panel data](#). *Journal of Health Economics*, 54, pp.124-134.

¹⁶ Popham, F. and C. Bamba (2008). [Movement from ill health related economic inactivity into employment and its impact on health: evidence from the Scottish Longitudinal Study](#). Scottish Longitudinal Study (SLS) Research Working Paper 1.

There will be other changes in personal circumstances between 2001 and 2011 that are not captured in this analysis. Crucially for this study, there could have been a change in the severity of the long-term health condition. Some may have gained additional educational qualifications, or the household composition/ circumstances have changed in this 10-year period.

This study looked at the binary outcome of whether being in employment 10 years after the base year (2001). This does not reflect the quality of the job, in terms of working conditions, pay, and meeting a person's education, work experience or preferences. Outcome Six of the [draft Programme for Government](#) ("We have more people working in better jobs") acknowledges this qualitative elements of employment. A Scottish study into occupational mobility found that having a limiting long-term illness reduced the probability of upward mobility and made it less likely to maintain a high occupational status between 1991 and 2001¹⁷. Assessing occupational mobility was beyond the scope of this research but would be possible to research using the Northern Ireland Longitudinal Study given that occupation was collected in both 2001 and 2011. However, the number of people in this sample with limiting long-term illness in 2001 and who were in employment in both 2001 and 2011 (4,309) may be too small for fine grained analyses.

Official statistics on the disability employment gap are published at the UK¹⁸ and [Northern Ireland](#) level from 2014 onwards, based on the Labour Force Survey. It is not possible to make a direct comparison between these official statistics and findings from this Census-based study due to the different age groups, time period and methodology. However, both sources show that the disability employment gap has fallen ([Annex A](#)). The disability employment gap in Northern Ireland is around ten percentage points larger than those in Scotland and Wales, and around 15 percentage points larger than in England. A similar study into the decomposition of disability employment gaps in these countries may help to explain those differences. Note that the disability employment gap is a 'relative' measure: it can be reduced by (proportionally) more disabled people joining the workforce, or (proportionally) more non-disabled people leaving the workforce.

This study has demonstrated that the disability employment gap can be broken down by differences in individual, household and areas characteristics between those with and without a long-term health problem or disability, as well as differences in the impact of these characteristics on being in employment. This provides some indication of the potential to reduce this gap from the labour supply side but will be subject to the ability to remove differences in these factors through policy interventions, as well as the future state of the economy, labour markets and workplace accessibility.

5. Conclusions

This study found for those aged 20 to 49 with limiting long-term illness in 2001, the main drivers for getting into and staying in work were having high educational qualifications and being in good general health. The disability employment gap for those aged 30 to 59 years in 2011 can be broken down by other differences at the individual, household and area level between those with and without a long-term health problem or disability, and the effect those differences have on the likelihood of being in employment. General health and highest educational qualifications were also found to be major components of the disability employment gap.

¹⁷ Van Ham, M., Findlay, A., Manley, D. & Feijten, P. (2011). [Migration, occupational mobility, and regional escalators in Scotland](#). 23rd ENHR Conference, Toulouse, France 5 - 8 July 2011 [SLS].

¹⁸ Department for Work & Pensions (February 2022). [The employment of disabled people 2021](#).

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Annex A: Variables and methodology

Description of variables

Activity limitation and long-term health conditions

This study used self-reported health problem/disability, as collected in the 2001 and 2011 Census in Northern Ireland. The 2001 question whether day-to-day activities were limited due to a health condition or disability which has lasted, or is expected to last at least 12 months, was elaborated upon in 2011 by distinguishing between 'limited a little' or 'limited a lot' (See Box 3 on page 7). People who reported no limitation to their activities are categorised as having 'no activity limitation'. This definition of disability is broadly consistent with the Government Statistical Service (GSS) harmonised standard and Disability Discrimination Act (DDA) 1995 definition. The 2011 Census also asked a self-reported long-term health conditions question, "*Do you have any of the following conditions which have lasted, or are expected to last, at least twelve months*".

Economic Activity

Economic activity comprised three groups: employed, unemployed and the economically inactive. Those not in employment are classed as unemployed if they are available to start in the next two weeks and have been looking for a job in the last four weeks or are waiting to take up a job. The economically inactive included those who are long-term sick, people looking after their family and/or home, students, people who are retired and people who are inactive for other reasons (for example, temporarily sick / injured or discouraged workers).

Area Deprivation

The Northern Ireland Multiple Deprivation Measure 2005 (NIMDM 2005) is a measure of multiple deprivation at the small area level. The NIMDM 2005 income domain was used to assign individuals into one of five equal groups (or quintiles) ranging from most deprived to least deprived. This measure was chosen as it was closest to the 2001 Census. Further detail can be found from the [NISRA Deprivation website](#).

Occupation

Occupation relates to the current or most recently held occupation. In this study, occupations are split into manual (1-4) and non-manual (5-9) using the first digit of the occupational code. It is postulated that those with non-manual occupations would be more likely to get into or stay in employment, as they could be less constraint by a (physical) health condition or disability to carry out work-related duties.

Educational qualifications

The highest level of educational qualification is derived from all that were 'ticked' from a list of qualifications. The first part of the analysis distinguishes between none, low (Level 1-2: at most 5+ GCSEs, one 'A' level, NVQ level 2 or equivalent) and high (Level 3-5: at least 2+ 'A' levels, NVQ level 3 or higher).

Other Variables

Provision of Unpaid Care: A person is a provider of unpaid care if they give any help or support to family members, friends, neighbours or others because of long-term physical or mental health or disability, or problems related to old age.

Number of dependent children: A dependent child is a person aged 0-15 in a household (whether or not in a family) or aged 16-18 in full-time education and living in a family with their parent(s).

Logistic regression

Logistic regression is a statistical technique to describe a binary outcome, in this case, whether being in employment, using explanatory variables. The analysis was carried out using Stata¹⁹. Most explanatory variables in this analysis were categorical, which means that one category had to be selected as a reference category, to compare the impact of other categories within the same variable against the outcome of the reference category. Reference categories were selected with a view to ease the interpretation of the results.

The estimated coefficients are transformed into odd ratios, which can be interpreted as follows:

- An odds ratio of one for the comparison group indicates no difference between the reference category and the comparison group.
- An odds ratio greater than one indicates that the comparison group is more likely to be in employment compared to the reference group. For example, the odds ratio for males (1.333) indicated that men are 33.3% more likely to be in employment than females (reference category), see Table C.1 in [Annex C](#).
- An odds ratio less than one indicates that the comparison group is less likely to be in employment in 2011. For example, the odds ratio for those living in the most deprived areas (0.804) indicated that people living here are 19.6% less likely to be in employment than those living elsewhere (reference category), see Table C.1 in [Annex C](#).

Confidence Intervals (CI's) are a range of likely values around the estimated odds ratio. Confidence Intervals of odds ratios that are in their entirety lower or higher than one, are statistically significant while those that do cross one are not statistically significant from the reference category. For example, the confidence interval for the odds ratio for males (1.224-1.451) states that there is a 95% chance that males are between 22.4% and 45.1% more likely to be in employment in 2011 compared to females (reference category), see Table C.1 in [Annex C](#).

¹⁹ See [Stata documentation on logistic regression](#)

Disability employment gap

The disability employment gap is the difference in the proportion of the population who are in employment between those with and without disabilities. Table A.1 below shows this gap in the NLS for 2001 and 2011, as well as those published from the Labour Force Survey. NLS populations in 2001 and 2011 were 178,297 and 190,424 respectively (aged 30-59 years and living in households), compared to around 4,000 individuals in the Labour Force Survey.

Table A.1. Disability employment gap (percentage points) in 2001 and 2011 (NLS), and estimates from the Labour Force Survey (2014-2020) ²⁰

Source / year	16-24 years	25-34 years	35-49 years	50-64 years	30-59 years
NILS 2001	27.0	50.4	54.9	52.6	56.7
NILS 2011	n/a	45.7**	51.3	49.6	52.3
LFS 2014	11.9*	43.8	50.7	50.1	50.5
LFS 2015	26.9*	49.3	47.8	52.5	51.3
LFS 2016	20.1*	43.0	48.7	52.7	51.0
LFS 2017	10.8*	44.0	46.4	48.3	50.2
LFS 2018	16.1*	42.8	44.5	51.1	49.7
LFS 2019	24.9	42.5	44.3	49.7	48.4
LFS 2020	18.0	48.5	41.8	47.1	49.7

* Low quality estimates based on small number of observations

** Aged 26-34

Decomposition techniques

The [Blinder-Oaxaca](#) decomposition technique is used to break down differences in levels, with the gender wage gap as a common area of study. This technique was extended by [Fairlie](#) to be applied to differences in binary variables, such as whether or not being in employment. One downside of this technique is that it can only decompose the disability employment gap attributed to differences in explanatory variable, not potential differences in the impact of these variables on employment.

This study used the [mvdcmp](#) command in STATA, which provides a three-way decomposition of the disability employment gap by splitting it into (a) differences in characteristics between those with and without disabilities, (b) differences in the effects of these characteristics on employment between those with and without disabilities, and (c) unexplained differences due to other factors. This command returns results that are consistent with the Fairlie technique. The decomposition applied normalisation of dummy variables, so that the unexplained component represents the average person in the sample, and not someone characterized by the reference category of each variable.

²⁰ LFS figures published in [Disability Employment Gap in Northern Ireland, 2020](#); for ages 30 to 59 years, figures are available under [user requested data](#) LFS2054 (2014-2020).

Annex B: Description of study populations 2001

Table B.1: Description of study population in 2001 and its proportion in employment by 2011 – individual characteristics

Characteristic in 2001	Population out of employment (2001)	Proportion in employment in 2011 (%)	Population in employment (2001)	Proportion in employment in 2011 (%)
Total Sample	14,660	24.4	5,993	71.9
Sex				
Male	6,152	25.7	3,276	73.7
Female	8,508	23.4	2,717	69.8
Age band				
20-29	2,301	33.1	1,234	77.3
30-39	5,306	27.6	2,131	75.6
40-49	7,053	19.1	2,628	66.3
General health				
Good	1,689	31.0	2,057	80.4
Fair good	4,310	26.9	2,486	71.8
Not good	8,661	21.8	1,450	60.0
Educational qualifications				
No Qualification	8,829	19.5	1,720	62.5
Level 1 or 2	4,587	30.0	2,587	74.1
Level 3 or higher	1,244	37.9	1,686	78.1
Provision of unpaid care				
No	12,702	24.2	4,740	72.4
Yes	1,958	25.5	1,253	69.9
(Previous) occupation				
Manual	6,786	23.6	2,394	69.3
Non-manual	5,275	28.5	3,599	73.6
Never worked	2,599	18.1	-	-
Year last worked				
2000 or 2001	1,807	42.1	-	-
Pre-2000	10,254	22.8	-	-
Never worked	2,599	18.1	-	-
Economic activity status				
Unemployed	834	41.1	-	-
Long-term sick or disabled	9,477	20.7	-	-
Looking after family/home	2,140	29.9	-	-
Other reason for inactivity	2,209	28.6	-	-
Full-time in employment	-	-	4,438	73.4
Part-time in employment	-	-	1,555	67.6

Table B.2: Description of study population in 2001 and its proportion in employment by 2011 – household and area characteristics

Characteristic in 2001	Population out of employment (2001)	Proportion in employment in 2011 (%)	Population in employment (2001)	Proportion in employment in 2011 (%)
Total Sample	14,660	24.4	5,993	71.9
Children in household				
None	6,367	20.4	2,631	67.8
One or more	8,293	27.5	3,362	75.1
Cars in household				
None	4,636	18.6	655	53.3
One or more	10,024	27.0	5,338	74.2
Tenure				
Owner occupied	7,723	28.6	4,967	75.0
Private rent	1,366	26.9	329	67.2
Social rent	5,571	17.9	697	52.4
Urban/rural definition				
Urban	10,135	23.0	3,919	70.7
Rural	4,525	27.4	2,074	74.2
Deprivation quintile (MDM'05)				
Most deprived	4,972	19.3	1,024	65.9
2nd Quintile	3,451	24.7	1,202	69.8
3rd Quintile	2,707	26.7	1,257	71.5
4th Quintile	2,227	28.0	1,321	75.7
Least deprived	1,303	31.8	1,189	75.4

Annex C: Odds ratios of getting into or staying in employment

Table C.1: Odds Ratios on likelihood to be in employment in 2011, people with limiting long term illness, not in employment, aged 20-49 in 2001 (n=14,660)

Characteristic in 2001	Univariate odds ratio*	Fully adjusted model	Confidence interval
Sex			
Female (reference)	1.000	1.000	-
Male	1.135	1.333	1.224 – 1.451
Age in April 2001			
	0.959	0.964	0.958 – 0.969
General health			
Not good (reference)	1.000	1.000	-
Fair	1.278	1.135	1.036 – 1.243
Good	1.443	1.287	1.192 – 1.518
Educational qualifications			
No Qualification (reference)	1.000	1.000	-
Level 1 or 2	1.614	1.286	1.174 – 1.409
Level 3 or more	2.387	1.818	1.589 – 2.081
Year last worked			
Never (reference)	1.000	1.000	-
2000/1	3.561	2.332	2.009 – 2.707
Pre-2000	1.665	1.345	1.192 – 1.518
Economic activity status			
Permanently sick/ disabled (reference)	1.000	1.000	-
Unemployed	2.361	1.851	1.572 – 2.179
Other reason economic inactivity	1.575	1.437	1.313 – 1.574
Social rent tenure (Yes)			
	0.532	0.689	0.625 – 0.759
Children in household (Yes)			
	1.565	1.387	1.272 – 1.513
Cars in household (Yes)			
	1.707	1.218	1.100 – 1.347
Most deprived 20% (MDM'05)			
	0.634	0.804	0.733 – 0.882
Pseudo R² (goodness-of-fit)			
	-	0.071	-

* Univariate odds ratios show the independent effect for each predictor variable. They are adjusted for age and sex only, as they are likely to influence the impact of each predictor variable.

Table C.2: Odds Ratios on likelihood to be in employment in 2011, people with limiting long term illness, in employment, aged 20-49 in 2001 (n=5,993)

Characteristic in 2001	Univariate odds ratio*	Fully adjusted model	Confidence interval
Sex			
Female (reference)	1.000	1.000	-
Male	1.211	1.185	1.043 – 1.347
Age in April 2001			
	0.967	0.972	0.965 – 0.980
General health			
Not good (reference)	1.000	1.000	-
Fair	1.666	1.663	1.445 – 1.915
Good	2.530	2.447	2.092 – 2.861
Educational qualifications			
No Qualification (reference)	1.000	1.000	-
Level 1 or 2	1.630	1.530	1.328 – 1.762
Level 3 or more	2.111	1.911	1.626 – 2.246
Part-time work (Yes)			
	0.813	0.863	0.749 – 0.994
Children in household (Yes)			
	1.545	1.474	1.307 – 1.664
Cars in household (Yes)			
	2.641	2.182	1.831 – 2.600
Pseudo R ² (goodness-of-fit)	-	0.065	-

* Univariate odds ratios show the independent effect for each predictor variable. They are adjusted for age and sex only, as they are likely to influence the impact of each predictor variable.

Annex D: Description of study population 2011

Table D.1: Description of study population in 2011 for disability employment gap analysis – individual characteristics

Characteristic	Number of people	With limiting long-term condition (%)	Employment rate (%)	Disability employment gap (pps)
Total sample	190,424	19.1	73.8	52.3
Sex				
Male	92,126	18.3	77.7	53.3
Female	98,298	19.8	70.1	51.1
Age band				
30-34	28,995	9.9	79.1	46.9
35-39	31,801	12.5	78.3	48.6
40-44	34,994	16.0	76.8	51.7
45-49	35,329	20.3	74.7	52.8
50-54	32,168	25.3	70.5	53.5
55-59	27,137	31.5	61.6	51.5
General health				
Good	149,475	5.0	83.8	28.4
Fair good	28,577	59.3	46.6	34.3
Not good	12,372	96.5	15.1	33.4
Health condition				
Blindness or partial sight loss	1,933	66.6	42.2	51.9
Communication difficulty	2,180	88.9	18.5	42.7
Chronic illness	10,094	65.5	47.5	48.8
Breathing difficulty	14,048	53.2	50.6	57.8
Deafness or partial hearing loss	6,411	45.1	59.8	48.5
Learning difficulty	2,604	84.5	20.0	37.1
Long-term pain or discomfort	21,234	81.4	36.5	48.7
Mobility or dexterity difficulty	18,669	95.1	25.6	33.9
Mental health	17,675	75.9	27.3	46.3
Confusion or memory loss	2,936	94.5	12.9	40.9
Other condition	11,246	60.5	50.5	50.8
Educational qualifications				
No Qualification	42,054	37.3	46.6	50.0
Level 1	26,503	19.5	71.5	48.7
Level 2	28,910	16.4	77.2	45.2
Apprenticeship / other	16,798	17.2	78.7	42.2
Level 3	22,067	12.8	83.4	41.8
Level 4 (degree level)	54,092	9.2	88.7	33.8
Provision of unpaid care				
No	154,769	19.5	74.3	56.0
Less than 20 hours per week	21,152	13.4	83.9	30.2
20+ hours per week	14,503	22.9	52.9	30.8
Volunteering				
No	161,160	20.1	72.1	54.6
Yes	29,264	13.1	82.9	30.7

Characteristic	Number of people	With limiting long-term condition (%)	Employment rate (%)	Disability employment gap (pps)
Position in family household				
Part of couple	129,920	14.6	79.7	46.1
Lone parent	19,696	25.9	59.2	48.7
Child of couple	6,315	18.8	73.3	51.8
Child of lone parent	5,932	25.6	63.6	50.2
Not a family household	29,191	33.1	59.4	60.0
Tenure				
Owns outright	44,642	19.0	73.9	46.4
Owns with mortgage	101,035	12.8	84.3	43.7
Rents	44,747	33.3	49.9	51.0
Dependent children				
None	94,323	25.0	69.7	55.2
One child	36,067	16.4	77.5	50.2
Two children	37,047	11.3	81.0	44.6
Three or more children	22,987	11.5	73.0	43.3
Number of cars in household				
None	23,680	40.8	40.5	44.6
One car	64,678	22.1	69.3	52.7
Two or more cars	102,066	12.1	84.3	40.5
Capital value				
Lowest 20%	23,880	33.1	54.7	53.9
Quintile 2	33,806	26.3	62.4	53.6
Quintile 3	35,635	18.8	74.6	51.6
Quintile 4	41,977	15.2	80.2	45.5
Highest 20%	48,767	10.9	84.6	39.1
Missing	6,359	17.1	75.7	47.1
Urban/rural				
Urban (Band A-E)	118,755	20.5	72.2	54.3
Rural (Band F-H)	70,164	16.8	76.3	48.1
Missing	1,505	14.7	78.2	46.1
Settlement band				
Band A (Belfast City)	61,012	20.0	73.9	54.5
Band B (Derry City)	9,465	24.9	61.5	54.7
Band C	25,573	20.1	73.0	53.2
Band D	11,327	21.4	68.9	53.5
Band E	11,378	19.2	73.5	53.7
Band F (rural)	8,001	17.4	76.2	49.9
Band G (rural)	8,032	19.9	71.4	51.2
Band H (rural)	54,131	16.2	77.1	47.2
Missing	1,505	14.7	78.2	46.1

Annex E: Odds ratios of being in employment in 2011

Table E.1: Odds Ratios on likelihood to be in employment in 2011, people with or without limiting long term illness, and full sample (aged 30-59 in households)

Variables	With limiting long-term illness (n=36,295)	Without limiting long-term illness (n=154,129)	Full sample (n=190,424)
Limiting long term illness	-	-	0.248**
Male (female is reference)	1.603**	1.867**	1.803**
Age in April 2011	0.977**	0.984**	0.983**
Age squared	0.999**	0.997**	0.998**
General health			
Good (reference)	1.000	1.000	1.000
Fair	0.466**	0.520**	0.498**
Not good	0.186**	0.289**	0.181**
Educational qualifications			
No Qualification (reference)	1.000	1.000	1.000
Level 1	1.902**	1.831**	1.859**
Level 2	2.302**	2.368**	2.358**
Apprenticeship or other	2.695**	2.369**	2.465**
Level 3	2.841**	3.184**	3.112**
Level 4 or above	4.083**	4.080**	4.103**
Providing unpaid care			
None (reference)	1.000	1.000	1.000
Less than 20 hours per week	1.655**	1.035	1.168**
20 hours or more per week	0.796**	0.319**	0.384**
Volunteering (yes)	1.620**	0.943**	1.071**
Position in family household			
Not a family household (reference)	1.000	1.000	1.000
Part of couple	1.491**	1.272**	1.333**
Lone parent	1.446**	1.342**	1.379**
Child of couple household	0.705**	0.682**	0.694**
Child of lone parent	0.917	0.837**	0.862**
Number of dependent children			
None (reference)	1.000	1.000	1.000
One child	0.920*	0.853**	0.871**
Two children	0.828**	0.644**	0.681**
Three or more children	0.585**	0.360**	0.389**
Tenure			
Rents or rent-free (reference)	1.000	1.000	1.000
Own outright	1.706**	1.582**	1.615**
Own with mortgage / part-owns	2.329**	2.534**	2.492**

* significant at 5% level

** significant at 1% level

Variables	With limiting long-term illness (n=36,295)	Without limiting long-term illness (n=154,129)	Full sample (n=190,424)
Cars in household			
None	1.000	1.000	1.000
One car	1.497**	1.957**	1.827**
Two or more cars	2.235**	2.869**	2.693**
Settlement			
Band A (Belfast City)	1.191**	1.266**	1.249**
Band B (Derry City)	0.781**	0.517**	0.806**
Band C (Others with pop > 10k)	1.089*	1.253**	1.214**
Band D-H (reference)	1.000	1.000	1.000
Constant term	0.145**	0.673**	0.115**
Pseudo R ² (goodness-of-fit)	0.223	0.170	0.317

* significant at 5% level

** significant at 1% level

Annex F: Decomposition of disability employment gap 2011

Table F.1: Disability employment gap in 2011 and its components explained by differences in characteristics and effects at person, household and area-level, aged 30 to 59 years, living in households (n=190,424)

Variables	Difference in characteristics (pps)	Difference in effect (pps)
Sex		
Male	0.1**	0.6**
Female	0.1**	-0.6**
Age in April 2011		
Age squared	0.1**	-1.9**
General health		
Good	11.1**	-2.6**
Fair	-0.4**	-0.1
Not good	5.4**	0.0**
Educational qualifications		
No Qualification	4.1**	0.0
Level 1	0.0**	-0.1
Level 2	0.0	0.1
Apprenticeship or other	0.0**	-0.2**
Level 3	0.2**	0.2**
Level 4 or above	2.0**	0.0
Providing unpaid care		
None	0.0**	5.6**
Less than 20 hours per week	0.3**	0.0
20 hours or more per week	0.1**	-0.5**
Volunteering		
No	0.3**	-3.4**
Yes	0.3**	0.7**
Position in family household		
Not a family household	0.2	0.1
Part of couple	1.3**	-0.9*
Lone parent	-0.3**	0.0
Child of couple household	0.0**	0.0
Child of lone parent	0.0**	0.0
Number of dependent children		
None	-0.7**	1.4**
One child	0.1**	0.4**
Two children	0.0	-0.2
Three or more children	-0.4**	-0.6**

* significant at 5% level

** significant at 1% level

Variables	Difference in characteristics (pps)	Difference in effect (pps)
Tenure		
Rents or rent-free	1.9**	0.0
Own outright	0.0**	-0.3**
Own with mortgage / part-owns	1.6**	0.7**
Cars in household		
None	1.3**	-0.2**
One car	0.0	0.5**
Two or more cars	1.9**	0.7**
Settlement		
Band A (Belfast City)	-0.1**	0.0
Band B (Derry City)	0.1**	0.0
Band C (Others with pop > 10k)	0.0**	0.2*
Band D-H	0.0	-0.5*

* significant at 5% level

** significant at 1% level

Annex G: Decomposition of employment gap 2011 by condition

Table G.1: Employment gap in 2011 by health condition, and components explained by combined differences in characteristics and effects for person, household or area characteristics, aged 30 to 59 years, living in households (n=190,424)

Disability or health condition	Raw employment gap (pps)	General health (pps)	Other conditions (pps)	Qualifications (pps)	Age/ sex (pps)	Caring/ volunteer (pps)	Household position/ composition (pps)	Tenure / cars (pps)	Settlement (pps)	Unexplained (pps)
Confusion or memory loss	61.8	16.4	9.4	6.1	-0.5	12.6	-0.7	9.1	-0.4*	9.9
Communication difficulty	55.9	11.8	11.6	8.3	-2.5	10.6	3.0	8.0	1.0	4.3
Learning/ behavioural difficulty	54.5	10.3	6.6	13.0	-1.5	3.9	2.2	8.8	0.7	10.6
Mobility or dexterity difficulty	53.4	16.8	6.5	5.9	1.5	8.6	1.5	6.8	-0.1	5.8
Mental health	51.3	14.0	2.3	5.4	-0.4	6.3	-1.1	8.5	0.0	16.3
Long-term pain or discomfort	42.0	14.2	12.4	4.5	1.4	5.6	0.0	5.1	-0.3	-0.8
Blindness or partial sight loss	31.9	8.5	5.9	3.7	0.4	3.6	-2.9	5.7	1.2*	5.9
Chronic illness	27.7	10.7	6.4	2.8	1.2	2.4	-0.1	3.7	0.3	0.1
Difficulty breathing	25.1	8.6	7.5	3.4	1.0	2.2	-0.7	4.4	-0.2	-1.0
Deafness / partial hearing loss	14.5	4.7	4.5	1.9	-0.1	1.7	0.2	1.7	-0.2	0.0
Other health condition	24.7	8.8	4.7	2.2	0.4	3.1	0.8	2.9	0.0	1.6

* Components due to differences in both characteristics and effects were not significant for all categories within this variable