

In-house Report 109

Employment Retention and the Onset of Sickness or Disability: Evidence from Labour Force Survey longitudinal datasets

Employment Retention and the Onset of Sickness or Disability: Evidence from Labour Force Survey longitudinal datasets

**A study carried out on behalf of the Department for Work and
Pensions**

By

**Tania Burchardt
Centre for Analysis of Social Exclusion, London School of
Economics**

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THE AUTHOR

Tania Burchardt is a Research Fellow at the Centre for Analysis of Social Exclusion, London School of Economics. She was seconded to the Department for Work and Pensions for two months through the Treasury's summer placement scheme. This report is based on her work during that period.

EXECUTIVE SUMMARY

- **Job retention for disabled people is a key policy** objective of the New Deal for Disabled People, and specifically of the Job Retention and Rehabilitation Pilots. Promoting job retention serves both to increase employment rates among disabled people (a Public Service Agreement objective) and to reduce flows onto Incapacity Benefit. Implementation of the 1995 Disability Discrimination Act also requires that employers make reasonable adjustments to retain employees who become disabled.
- **This research had two objectives.** The first was to estimate the numbers becoming sick or disabled in work, the rate at which they leave employment, and the characteristics associated with increased risk of job loss. The second objective was to explore the potential of longitudinal Labour Force Survey datasets for analysis of disabled people's employment.
- **The percentage of employees becoming sick or disabled** was found to be 2.6 per cent quarter on quarter, using a definition of disability based on the Disability Discrimination Act ('DDA disability'). This is equivalent to about 608,000 individuals. Using a definition based on receipt of Statutory Sick Pay or Incapacity Benefit ('SSP/IB receipt'), the percentage was 0.3 per cent, or 73,000 individuals.
- **Estimates of retention rates are highly sensitive** to the definition of sickness or disability used. Five per cent of those who become DDA disabled leave employment almost immediately, compared to 23 per cent of those who become SSP/IB recipients. After 9 to 12 months have elapsed, 13 per cent of those who became DDA disabled have left employment, compared to nearly half of SSP/IB recipients.
- **Most factors which are associated with increased risk of leaving employment** following onset of sickness or disability are also associated with increased risk of leaving employment in general. These common factors can be categorised as low human capital (lack of educational qualifications, short job tenure) and poor employment protection (small workplace, female gender or part-time employment, manufacturing or construction industry).
- **Three risk factors are specific to the onset of sickness or disability.** These are: reporting mental health problems (a particularly strong effect), being aged 45 or over (especially for SSP/IB receipt), and living in a region with low labour demand.
- **The longitudinal Labour Force Survey datasets** are a rich source of data on disabled people's employment transitions, although they would be greatly enhanced by the inclusion of an indicator of severity of impairment.

1 INTRODUCTION

1.1 Policy Context

- 1.1.1 Policy concern about job retention of people who become sick or disabled while in work arises from at least three sources. Firstly, the Department of Work and Pensions inherited from its two predecessor departments a Public Service Agreement objective to increase the employment rate of disabled people. The New Deal for Disabled People (NDDP) is intended to make a major contribution towards meeting this objective. One component of NDDP is the Job Retention and Rehabilitation Pilot (JRRP), announced in 2000, and due to commence in early 2002. The aim of the JRRP is to assess the relative effectiveness of different delivery and intervention strategies in preventing job loss following onset of sickness or disability.
- 1.1.2 Secondly, expenditure on Incapacity Benefit (IB) made up over one quarter of benefit expenditure on people of working age in 2000/01 (excluding Housing Benefit). Much of the NDDP is aimed at helping people off benefits like IB and into work. However, if those who become sick or disabled while in employment can be helped to remain in work, it may be possible to prevent a claim for IB occurring in the first place. Reducing the flow onto higher-rate IB is therefore another objective of job retention.
- 1.1.3 Thirdly, job retention is covered by the 1995 Disability Discrimination Act (DDA). Employers are required to make reasonable adjustments to retain employees who become sick or disabled. Examining the extent to which employees are retained, and whether there are systematic differences by type of employer, is therefore relevant to on-going assessment of the implementation of the DDA.

1.2 Existing evidence

- 1.2.1 Little is known about the risks of losing employment after becoming sick or disabled. Barnes, Thornton and Campbell (1998) in their review for the Joseph Rowntree Foundation, observed, "There is no readily available information about the number of people who become disabled in work and the proportion who consequently leave their employment" (p.34). Administrative statistics indicate that 183,000 individuals moved from employment onto IB (the majority with an intervening spell on Statutory Sick Pay) during 1999/2000. Analysis of data from the British Household Panel Survey (Bardasi, Jenkins and Rigg, 2000) suggested that 80 per cent of all those who become disabled are in employment at the time of onset, falling to 60 per cent the following year and 36 per cent the year after that.
- 1.2.2 Less still is known about who is most at risk of leaving employment. Stafford (2000) drew on studies of sickness absence to suggest the risk might be structured by gender, age, industry, occupation and type of impairment. Analysis of the British Household Panel Survey (Burchardt, 2000a), indicated that older age, musculoskeletal problems, sensory impairment or mental illness, manual occupation, and smaller workplace were all independently associated with increased risk of leaving employment following onset of disability. However, the small sample size mean these results must be treated with caution.

1.2.3 In terms of interventions to prolong job retention, surveys suggest employers are willing to make adaptations to retain employees who become disabled, but the extent to which this is successful is unknown (Morrell, 1990; Dench and others, 1996). In addition to physical alterations to the workplace, changes which can help include being able to work at a slower pace, flexible working conditions and creating a less stressful environment (Thomas, 1992). A number of the innovative schemes under the first phase of the New Deal for Disabled People explored retention issues, with varying degrees of success (Blackburn, Child and Hills, 1999).

1.3 Research questions

1.3.1 There were three principal questions for this research:

- How many individuals become long-term sick or disabled in work, over a given period?
- At what rate do they leave employment, following onset of sickness or disability?
- What characteristics are associated with an increased risk of leaving employment?

1.3.2 A further objective of the research was to explore the potential of longitudinal Labour Force Survey datasets for analysis of disabled people's employment.

2 DATA AND METHODS

2.1 Data

- 2.1.1 The Labour Force Survey (LFS) is usually analysed cross-sectionally. However, individuals are interviewed five times at quarterly intervals, and it is possible to link individuals' responses across quarters to produce longitudinal datasets or panels. The first interview for any individual is referred to as Wave 1, and subsequent interviews as Waves 2 to 5. The analysis reported in this paper uses nine 5-quarter longitudinal datasets from Spring 98 through to Spring 01, as shown in the table below.
- 2.1.2 The sample for each panel consists of individuals of working age who responded at all five waves, producing a sample size of about 10,000. The Appendix gives further details of the sample and the weights devised by the Office for National Statistics to counteract possible attrition bias.
- 2.1.3 Two definitions of sickness and disability are used. The first is 'DDA disability', a definition in line with that included in the 1995 Disability Discrimination Act. DDA disability is a health problem or disability that substantially limits the individual's ability to carry out normal day to day activities, and has lasted, or is expected to last, for at least a year. Details of the LFS variables on which the definition is based are given in the Appendix.
- 2.1.4 The second definition used is 'SSP/IB receipt', where the individual reports receipt of Statutory Sick Pay or Incapacity Benefit. Again, details are given in the Appendix of the LFS variables and validation work that was undertaken.

Table 1: Nine panels of the LFS

Wave	1	2	3	4	5
Panel 1	Spr 98	Sum 98	Aut 98	Win 98	Spr 99
2	Sum 98	Aut 98	Win 98	Spr 99	Sum 99
3	Aut 98	Win 98	Spr 99	Sum 99	Aut 99
4	Win 98	Spr 99	Sum 99	Aut 99	Win 99
5	Spr 99	Sum 99	Aut 99	Win 99	Spr 00
6	Sum 99	Aut 99	Win 99	Spr 00	Sum 00
7	Aut 99	Win 99	Spr 00	Sum 00	Aut 00
8	Win 99	Spr 00	Sum 00	Aut 00	Win 00
9	Spr 00	Sum 00	Aut 00	Win 00	Spr 01

- 2.1.5 It is important to understand how these groups differ. On average over the period, 15.2 per cent of individuals report DDA disability, and just 4.5 per cent of individuals report receipt of SSP/IB. Nearly all (91 per cent) of SSP/IB recipients are also DDA disabled, but the converse is not true. The SSP/IB group consists of those who have

been in employment and paid sufficient National Insurance Contributions, who are now not working and who are deemed incapable of work. The DDA disabled group may be currently working, be off work, or not employed at all: the definition simply requires that they have a long-term and substantially limiting health problem or impairment.

- 2.1.6 The JRRP are targeted at those who are employed and have been in receipt of SSP or IB for six weeks. This target group is similar, though not identical, to those identified in the LFS panels as becoming an SSP/IB recipient in work, i.e. those employed and not an SSP/IB recipient at one wave, and an SSP/IB recipient at the following wave. The latter have been employed (though they may no longer be so) and have been in receipt of SSP/IB for between 1 and 13 weeks (since interviews are approximately three months apart).
- 2.1.7 For the main LFS, ONS set a publication threshold of 10,000, below which estimates are not considered to be reliable. This corresponds to a sample size of about 30, and a relative standard error of 20 per cent. The same principle applies to the panels, but since sampling variability is higher (due to smaller sample sizes), the thresholds are higher. Combining data from several panels boosts the overall sample size and hence allows estimates to be produced for even quite small sub-sections of the population with a reasonable degree of reliability.
- 2.1.8 The disadvantage of combining data from several panels is the extended time period covered. The implicit assumption is that becoming sick or disabled in work in 1998 was the same sort of experience as becoming sick or disabled in 2001. This may not be true, especially given changes in policy and in the economy over that period. Accordingly, trends over time were investigated and the results are reported in the Appendix (5.4.2).

2.2 Methods

- 2.2.1 Three approaches to the data were adopted, corresponding to the three research questions listed above.
- 2.2.2 Firstly, the employment and sickness/disability status of individuals were compared wave on wave, in order to calculate the number and proportion of individuals becoming sick or disabled while in work. Individuals were defined as becoming sick or disabled in work if they were in employment and not sick or disabled at one wave, and sick or disabled at the following wave. The Appendix gives further details.
- 2.2.3 Secondly, Kaplan-Meier survival functions for employment retention after onset of sickness or disability were calculated. A survival function gives the proportion of those at risk from suffering an event (in this case, leaving employment) who have not yet done so. Individuals are observed for varying durations following onset of disability (those who become disabled at Wave 2 are observed for a further three waves, while those who become disabled at Wave 5 generate no further observations), and the function takes account of this fact (known as ‘right-censoring’).
- 2.2.4 Thirdly, Cox proportional hazards models were fitted to examine the characteristics associated with higher risk of employment loss. Cox proportional hazards models

produce estimates of the association between covariates (characteristics like age and sex) and the risk in question (leaving employment). They are based on the assumption that the risks faced by sub-groups defined by covariates are proportional over time. This assumption was tested, and as a result some models were stratified, allowing the risks faced by groups in each strata to be different.

- 2.2.5 To provide a framework for the multivariate analysis, the factors thought to increase (or decrease) probability of employment retention were considered, and corresponding indicators in the LFS panels identified. The factors and indicators are listed in Table 2.
- 2.2.6 Reasonable indicators were found for most of the factors thought to be important. The exceptions were severity of impairment, previous sickness spells, and job satisfaction, for which no indicators were available. The indicator for replacement rate was also unsatisfactory: since hypothetical out-of-work incomes are not available, usual gross hourly earnings was used as a proxy indicator, on the assumption that those with lower earnings will tend to have higher replacement rates. Actual replacement rates will also vary with the economic activity of any other household members, state benefit entitlement and availability of occupational sick pay or pension.

Table 2: Factors hypothesised to increase or decrease probability of employment retention

Factors which might increase employment retention	LFS indicator
<i>High human capital</i> Higher educational qualifications More skilled occupation Longer job tenure Older age	Educational qualifications (4 categories) Occupational group (major SOC classification) Duration of current job in years (4 categories) Age 45+
<i>Good employment protection</i> Larger workplace (easier to redeploy) Full-time employee Longer job tenure Higher status occupation Industry with better terms & conditions Male White	Number of employees at workplace (2 categories) Works 35+ hours per week As above Occupational group (major SOC classification) Industry (major SIC 92 classification, collapsed into 4 categories) [†] Sex Ethnicity (White, Black, Asian, Chinese/other)
<i>Positive motivation</i> Job satisfaction Younger age	[Not available] Age 16-29
Factors which might decrease employment retention <i>Poor health</i> Greater severity of impairment Previous sickness spells Mental health problem	[Not available] [Not available] Depression, anxiety or other mental health problem
<i>Financial disincentives</i> High out-of-work replacement rate	Usual gross hourly earnings (quartiles)
<i>Low labour demand</i> High regional unemployment rate High cyclical unemployment rate	Region (11 categories) Date at onset (by quarter: 13 categories)

[†] Major industrial sectors (SIC 92) grouped as follows:

‘Manufacturing and construction’ (a to f): agriculture, hunting, forestry, fishing, mining, quarrying, manufacturing, electricity gas and water supply, construction.

‘Financial services’ (j, k): financial intermediation, real estate, renting and business activities.

‘Other services’ (g to i): wholesale, retail and motor trade, hotels and restaurants, transport, storage and communication.

‘Public’ (l to o): public administration and defence, education, health and social work, other community, social and personal.

3 RESULTS

3.1 Numbers who become sick or disabled in work

3.1.1 Table 3 shows the numbers and percentages of employees who become sick or disabled, quarter on quarter. These figures are lower than the total number of employees who become sick or disabled because some individuals become sick and recover before the following interview. The difference is likely to be quite large for SSP/IB receipt, since many spells on SSP are short, but small for DDA disabled, since part of the definition of DDA disability is that the health problem or impairment is expected to last for at least a year. An alternative reading of the table is ‘employees who become sick or disabled and remain so for at least 1 to 13 weeks’.

Table 3: Numbers and percentages of employees who become sick or disabled, quarter on quarter

	DDA disabled	SSP/IB receipt
Percent of employees	2.6	0.3
Estimated number	608,000	73,000

3.1.2 The estimated inflow to DDA disability may seem large in comparison to estimates of the total stock of DDA disabled employees (about 2.4 million). However large outflows from DDA disability are also observed: around 400,000 quarter on quarter. The extent to which these estimated flows are affected by measurement error is discussed in Appendix section 5.3; although high, they are consistent with other work on dynamics of disability (Burchardt, 2000b).

3.2 Rate of employment retention after onset of sickness/disability

3.2.1 Table 4 shows how the percentage of those who become sick or disabled who remain in employment falls as time since onset increases. The time points listed correspond to the timing of LFS interviews: the interview at which sickness or disability is first reported is between 0 and 3 months after onset, the next interview is 3 to 6 months after onset, and so on. The maximum duration for which anyone is observed is 12 months after onset. The same patterns are illustrated in Figures 1 and 2.

Table 4: Employment retention following onset of sickness or disability

Time after onset	Percentage remaining in employment after onset of:	
	DDA disability	SSP/IB receipt
> 0 to 3 months	95	77
> 3 to 6 months	92	66
> 6 to 9 months	89	57
> 9 to 12 months	87	53

Figure 1: Employment retention following onset of DDA disability

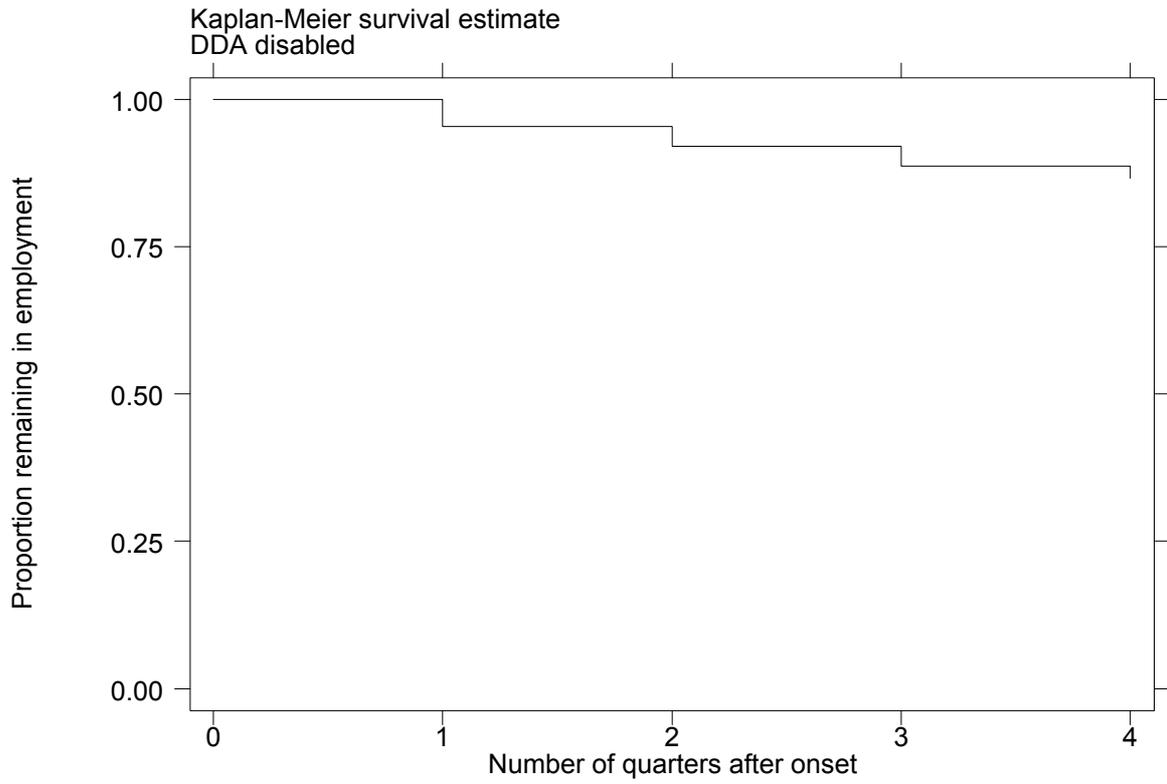
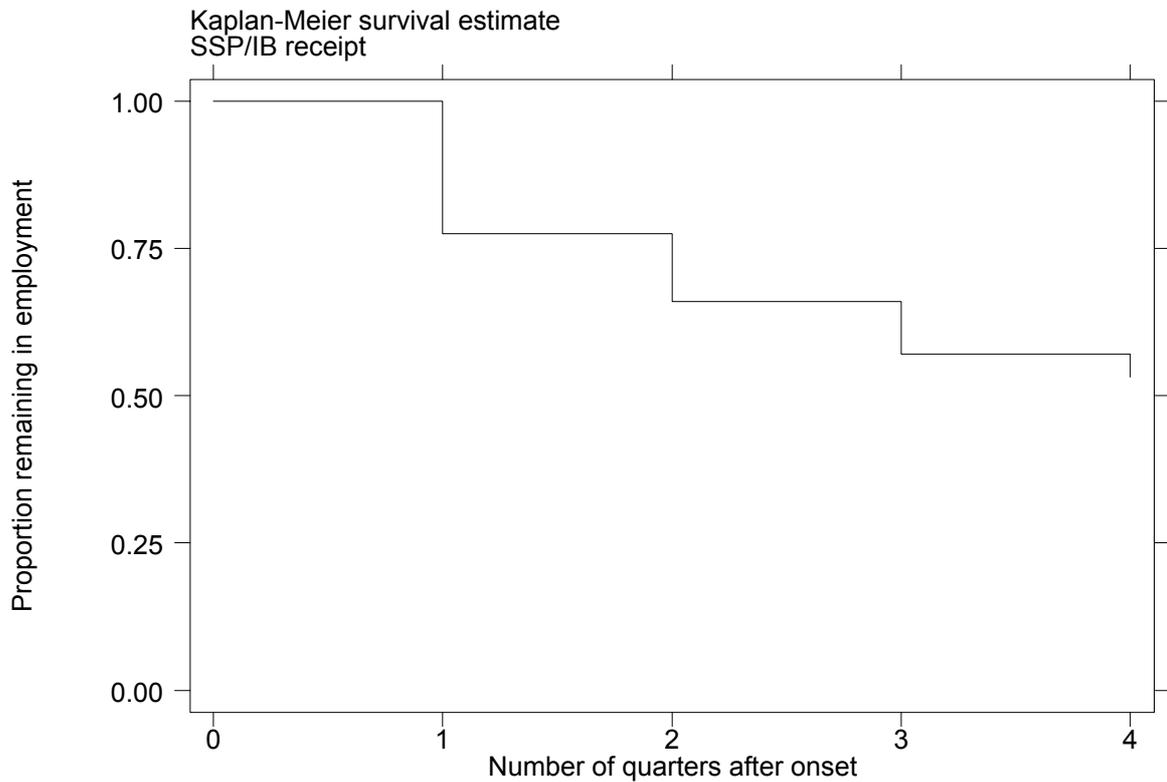


Figure 2: Employment retention following onset of SSP/IB receipt



- 3.2.2 The difference between those who become DDA disabled, and those who start an SSP/IB spell, is striking. While only 5 per cent of those who become DDA disabled leave employment almost immediately, 23 per cent of the SSP/IB group do so. This difference is maintained over time, so that after 9 to 12 months have elapsed, 13 per cent of those who became DDA disabled have left employment, and nearly half of the SSP/IB group have done so.
- 3.2.3 The cause of this difference may not be SSP/IB receipt itself: as noted above, the two groups are very different in size and composition. It is possible that those who qualify for SSP and IB suffer from worse health or are more severely impaired, on average, than the DDA disabled group. It is also possible that the sorts of condition from which those who become DDA disabled suffer are more easily accommodated in the workplace.
- 3.2.4 If we restrict our attention to those in employment who become DDA disabled and are off work (around 1 in 5 of all those in employment who become DDA disabled), their trajectory is closer to employees who become SSP/IB recipients: 75 per cent remain in employment initially, falling to 60 per cent after 9 to 12 months have elapsed.¹
- 3.2.5 Not all departures from employment subsequent to the onset of sickness or disability are *caused* by the sickness or disability. Other reasons include leaving to bring up children or care for relatives, to study or to retire, being made redundant or the contract coming to an end - all reasons which also apply to the non-disabled. One way to gauge the proportion of employment loss which is due to onset of sickness or disability itself is therefore to compare rates of employment retention between the general population and those who become sick or disabled. The comparison is inevitably somewhat crude since the groups differ respects other than sickness or disability status - most importantly in terms of age.
- 3.2.6 Of all those in employment at one wave, 95 per cent are still in employment at the following wave. The percentage falls to 88 per cent by the fourth wave. This rate of employment retention is close to the rate for those who become DDA disabled, suggesting that the onset of DDA disability may not in itself be an additional risk factor. Allowing for differences in the age profile between the two groups reveals a slightly lower rates of employment retention among those who become DDA disabled but the difference is not statistically significant.
- 3.2.7 Employment retention rates for those who become SSP/IB recipients are significantly lower than employment retention for the general population. The difference is 18 percentage points initially, growing to 35 percentage points after 9 to 12 months. Similar differences are observed for those who become DDA disabled and are off work.

¹ A comparison of the characteristics of those who become DDA disabled and are off work with those who become disabled but are not off work suggests that the former are more likely to remain disabled at the following quarter, more likely to have musculoskeletal problems, depression, anxiety or a progressive illness, to work part-time, and to be in a larger workplace. This suggests that a mixture of environmental and intrinsic factors is responsible for the difference in experience of the two groups.

3.2.8 Some of those who become sick or disabled recover in due course: after 9 to 12 months, 37 per cent of those who became DDA disabled are no longer reporting disability, and 62 per cent of those who started receiving SSP/IB are no longer recipients. Recovery may in itself affect the chances of employment retention or of re-finding employment. Table 5 shows retention rates for those who remain sick or disabled, for comparison with the overall rates in Table 4.

Table 5: Employment retention following onset of sickness or disability, for those who remain sick or disabled

Time after onset	Percentage remaining in employment after onset of:	
	DDA disability	SSP/IB receipt
> 0 to 3 months	96	80
> 3 to 6 months	93	62
> 6 to 9 months	90	42
> 9 to 12 months	87	32

3.2.9 Retention rates for those who become and remain DDA disabled are not significantly different from the rates shown in Table 4. For SSP/IB receipt, those who remain sick (and hence continue to receive SSP/IB) are less likely to retain employment, especially if they remain sick for longer than six months. By the fourth quarter after onset, only one in three still have a job to which they could return.

3.3 Characteristics associated with increased risk of leaving employment

3.3.1 Explanatory variables for the risk of leaving employment following onset of DDA disability were selected for inclusion in multivariate analysis on the basis of Table 2. Variables which were consistently insignificant across a range of model specifications were dropped (in this case, occupation, ethnicity and date at onset). Possible interactions between variables were checked, with the result that in the final models ‘sex’ and ‘whether full-time’ were interacted. All models were tested to ensure that they did not violate the proportional hazards assumption. In the case of DDA disability, it was necessary to stratify the models by job tenure (two categories: less than 2 years in post and all others). This means that the way in which the risk of leaving employment develops over time for those with short job tenure is different.

3.3.2 Results are reported in Table 6. The middle column shows the association of each characteristic (relative to the omitted category) with risk of leaving employment following onset of DDA disability. A hazard ratio greater than 1 indicates increased risk; less than 1 indicates decreased risk. Since people leave employment for all sorts of reasons other than disability, for comparison the right-hand column shows the association between the same characteristics and leaving employment for employees in general.²

² Note that this is not a full model of employment retention for all employees (other variables not included here might also be significant): it simply shows the relationship between the characteristics found to be significant for those who become disabled, and the risk of leaving employment for all employees.

Table 6: Characteristics associated with risk of leaving employment following onset of DDA disability

Cox proportional hazards model, stratified by job tenure

(Hazard ratio > 1 indicates increased risk relative to omitted category; hazard ratio < 1 indicates decreased risk)

Characteristic		Following onset of DDA disability Hazard ratio and significance	All employees Hazard ratio and significance
<i>Human capital</i>			
Educational qualifications	Higher	[omitted]	[omitted]
	Further	1.45**	1.11**
	Secondary or lower	1.40*	1.10*
	None	1.91**	1.13**
<i>Employment protection</i>			
Size of workplace	1-49 employees	[omitted]	[omitted]
	50+ employees	0.73**	0.89**
Sex and whether full-time	Women, part-time	[omitted]	[omitted]
	Women, full-time	0.80	0.76**
	Men, part-time	1.74**	1.45**
	Men, full-time	0.65**	0.57**
Industrial sector	Manufacturing and construction	[omitted]	[omitted]
	Financial services	0.66**	0.72**
	Other services	0.63**	0.71**
	Public	0.57**	0.59**
<i>Motivation</i>			
Age group	16-29	[omitted]	[omitted]
	30-44	0.96	0.64**
	45+	1.19	0.84**
<i>Health</i>			
Any mental health problem	Yes	2.46**	n/a
<i>Financial incentives</i>			
Usual gross hourly earnings	Bottom quartile	[omitted]	[omitted]
	2 nd	0.68**	0.69**
	3 rd	0.75*	0.67**
	Top quartile	0.78	0.73**
<i>Labour demand</i>			
Region	Wales	[omitted]	[omitted]
	Northern	0.76	1.06
	Yorks and Humberside	0.68	0.95
	East Midlands	1.41	1.00
	East Anglia	2.34**	0.91
	South East	1.32	1.08
	South West	1.37	1.02
	West Midlands	1.19	1.01
	North West	1.50	1.05
	Scotland	1.02	1.02
	Northern Ireland	3.27**	0.92
<i>Number of observations</i>		13,058	190,394

* statistically significant at 10% level ** statistically significant at 5% level

Standard errors adjusted for clustering on individuals

- 3.3.3 Looking first at the characteristics associated with leaving employment following onset of DDA disability, the strongest associations are with mental health problems (more than doubling the risk of leaving employment), and region of residence. Compared to living in Wales - which is in itself associated with a relatively high risk of leaving employment - those living in East Anglia or in Northern Ireland are at even greater risk. (The result for East Anglia is surprising and may be a statistical accident, though it is significant at the 5 per cent level).
- 3.3.4 Other characteristics found to be associated with increased risk are: lacking educational qualifications, working at a workplace with less than 50 employees, working part-time (if male), working in manufacturing or construction, and having low earnings. These results are consistent with the hypothesised relationships.
- 3.3.5 Most of these characteristics are also associated with increased risk of leaving employment among employees in general. The main differences are that having low or no qualifications appears to be more important following onset of disability, while age differentials matter less. Regional differences are not significant for employees in general, but are quite marked following onset of disability.
- 3.3.6 A similar procedure was followed for SSP/IB receipt, and the results are reported in Table 7. In this case, occupation, industry, ethnicity and date were consistently not significant across different model specifications and hence were dropped. It was not necessary to stratify by job tenure.
- 3.3.7 Once again, having no or low qualifications is associated with a significantly increased risk of employment loss, and the association is stronger than for employees in general.
- 3.3.8 Those who have been in their job for less than two years are at much greater risk of leaving employment than those who have been in their job for 2 to 12 years. Very long-term tenure (13 years or more) is associated with a slight increase in risk again, though not to the same levels as for very short term tenure. This pattern holds for both those who become sick and employees in general, although the differentials are smaller for the former.
- 3.3.9 Small workplaces are associated with increased risk, but there is no difference here between the SSP/IB group and employees in general. Men who work part-time are at greatest risk of leaving employment, followed by women who work part-time or full-time. Full-time male workers are at least risk. This pattern holds for those who become sick and for employees in general, but the differentials are larger for those who become sick.
- 3.3.10 Those who start an SSP/IB spell and are aged 45 or over are at significantly higher risk of leaving employment than younger age groups. The same does not apply for employees in general: the youngest age group (16-29) are at greatest risk, followed by the 45+ age group.
- 3.3.11 Once again mental health problems significantly increase the risk of employment loss, compared to other health conditions or impairments.

Table 7: Characteristics associated with risk of leaving employment following onset of SSP/IB receipt

Cox proportional hazards model

(Hazard ratio > 1 indicates increased risk relative to omitted category; hazard ratio < 1 indicates decreased risk)

Characteristic		Following onset of SSP/IB receipt Hazard ratio and significance	All employees Hazard ratio and significance
<i>Human capital</i>			
Educational qualifications	Further or higher Secondary, lower or none	[omitted] 1.28*	[omitted] 1.08**
Job tenure	< 2 years 2-5 years 6-12 years 13+ years	[omitted] 0.61** 0.59** 0.70*	[omitted] 0.54** 0.36** 0.45**
<i>Employment protection</i>			
Size of workplace	1-49 employees 50+ employees	[omitted] 0.80*	[omitted] 0.80**
Sex and whether full-time	Women, part-time Women, full-time Men, part-time Men, full-time	[omitted] 0.94 2.22** 0.56**	[omitted] 0.61** 1.47** 0.81**
<i>Motivation</i>			
Age group	16-29 30-44 45+	[omitted] 0.87 1.69**	[omitted] 0.64** 0.85**
<i>Health</i>			
Any mental health problem	Yes	1.64**	n/a
<i>Financial incentives</i>			
Usual gross hourly earnings	Bottom quartile 2 nd 3 rd Top quartile	[omitted] 1.18 0.73 0.97	[omitted] 0.69** 0.67** 0.71**
<i>Labour demand</i>			
Region	Wales Northern Yorks and Humberside East Midlands East Anglia South East South West West Midlands North West Scotland Northern Ireland	[omitted] 0.77 0.62* 0.48** 0.75 0.52** 0.36** 0.51** 0.85 0.78 0.79	[omitted] 1.09 0.96 1.04 0.92 1.08 1.05 1.04 1.07 1.04 0.93
<i>Number of observations</i>		1,365	190,957

* statistically significant at 10% level ** statistically significant at 5% level

Standard errors adjusted for clustering on individuals

- 3.3.12 No significant relationship was found between earnings and risk of leaving employment following SSP/IB receipt. However for employees in general, those in the lowest earnings quartile group are at increased risk, compared to the top three quartiles.
- 3.3.13 As was found for DDA disability, there are significant differences in employment retention by region of residence for those who become sick or disabled, but not for employees in general. Compared to Wales (a high risk region), living in the South West, East Midlands, West Midlands or South East is associated with lower risk of leaving employment after becoming an SSP/IB recipient.

4 DISCUSSION

4.1 Employment retention

- 4.1.1 Estimates of retention rates are highly sensitive to the definition of sickness or disability used. This emphasises the importance of careful selection of target group for any intervention. While those who become DDA disabled have retention rates similar to employees in general, those who become DDA disabled and go off work have much lower retention rates, similar to those who begin a spell of SSP/IB receipt. Among SSP/IB recipients, those who recover within six months have higher retention rates than those who remain sick.
- 4.1.2 Further analysis of those who become DDA disabled but do not go off sick could be rewarding. Their retention rates are high. Preliminary analysis suggests they may be less severely impaired than those who take time off work, but there are also differences relating to job and workplace characteristics. If these environmental factors help them to remain actively in employment despite the onset of disability, intervention for others could also be useful, at a point prior to the ‘six weeks off work’ threshold proposed for the JRRP.
- 4.1.3 Employment retention rates following onset of SSP/IB receipt are low: only half remain in employment after 9 to 12 months have elapsed. Of course, many of those who leave employment will return at a later date, but either preventing employment loss or shortening the period out of work must be a priority.
- 4.1.4 For the most part, the factors which are associated with increased risk of leaving employment following onset of sickness or disability are also associated with increased risk of leaving employment in general. This does not mean these factors are unimportant: if seeking to identify high risk groups among the sick and disabled, these are the factors which count. The main common factors can be categorised as human capital (lack of educational qualifications, short job tenure) and employment protection characteristics (small workplace, female gender or part-time employment, manufacturing or construction industry).
- 4.1.5 Three factors are specific to the risk of leaving employment following onset of sickness or disability. The first is having mental health problems, which appears to have a much stronger effect than other types of impairment.
- 4.1.6 The second factor is age. For employees in general, the youngest age group is at the highest risk of leaving employment. For those who become sick or disabled, those aged 45+ are at greatest risk, and for SSP/IB receipt this is by a considerable margin. Given that older age is associated with longer job tenure, which in turn decreases risk of leaving employment, the explanation for the age effect must lie elsewhere. One possible interpretation is that older workers are more likely to be able to take early retirement, perhaps with the help of an occupational pension.
- 4.1.7 The third factor specific to onset of sickness or disability is labour demand, as proxied by region. There are marked regional differences: 88 per cent of employees in the South East retained their employment immediately after onset of SSP/IB receipt,

compared to just 67 per cent of those in Wales. Of course, region may reflect differences other than labour demand not controlled for in the models, but given the ranking of regions, labour demand seems a natural interpretation.

4.2 Use of LFS panels for analysis of disabled people's employment

- 4.2.1 There are three main limitations in using the LFS panels for analysis of disabled people's employment. The first is that each panel consists of about 10,000 individuals: too small for small subgroup analysis such as disabled entrants to, or leavers from, employment. In most cases this can be overcome satisfactorily by combining several panels; however if the phenomenon under investigation is subject to trends over time the number of panels which can be combined is limited.
- 4.2.2 The second drawback is the lack of an indicator of severity of impairment. We know that the disabled population is heterogeneous, and in particular that the difference in employment rates by severity of impairment is wide. Not being able to distinguish levels of severity of impairment in the LFS means that the disadvantage experienced by more severely disabled people is seriously under-estimated, while the disadvantage experienced by the larger number of less severely impaired people is slightly over-estimated. The incorporation of an indicator of severity of impairment (for example a shortened version of the OPCS severity score, as used by the Health Survey for England) would substantially enhance the usefulness of the LFS for disability research.
- 4.2.3 The third difficulty is the apparent inconsistency in measurement of 'substantial limitation' in day to day activities across waves (see Appendix section 5.3). It is hoped that the further investigations being carried out by ONS will resolve this issue.
- 4.2.4 The richness and unique qualities of the LFS panels far outweigh the disadvantages. Several definitions of sickness and disability are available and the detail on employment circumstances is unrivalled by any other source. Moreover the unique format of the panels, giving observations on individuals for five consecutive quarters, facilitates new analysis of movements into and out of employment, including the all-important transitional stages such as being employed but off sick. Other longitudinal sources, such as the British Household Panel Survey, are useful for longer time perspectives but have limited information on transitions within each year. The LFS panels should become first choice for analysis of short-run employment dynamics.

5 APPENDIX

5.1 Definitions

- 5.1.1 The sample was restricted to those who responded at all five quarters of the panel and who were of working age (16 to 59 for women, and 64 for men).
- 5.1.2 Respondents were defined as in *employment* if they did any paid work for an employer in the week before interview, or had a job that they were away from in that week, based on variable INECACA. All those who were not in employment were defined as non-employed (including the self-employed).
- 5.1.3 Respondents were defined as *SSP/IB recipients* if they reported receiving Statutory Sick Pay or Incapacity Benefit in the week before interview, based on variables SKDSBN1 to SKDSBN7.
- 5.1.4 Respondents were defined as *DDA disabled* if they reported health problems or disabilities which they expected to last for more than a year (based on variable LNGLIM) and either reported a progressive illness (based on variables HEAL01 to HEAL17) or reported that their health problems or disabilities substantially limited their ability to carry out normal day to day activities (based on variable HEALIM). This corresponds to the definition of current disability in the 1995 Disability Discrimination Act.
- 5.1.5 Respondents were defined as *becoming sick or disabled in work* if they were in employment and not sick or disabled at one quarter, and sick or disabled at the following quarter. Thus it is possible for respondents to become sick or disabled in work and leave employment at the same quarter. (In that case it is not known whether the onset of sickness/disability preceded or followed the departure from employment).
- 5.1.6 Respondents were defined as *at risk* of becoming sick or disabled in work if they were in employment and not sick or disabled at one quarter, and were observed for at least one following quarter.

5.2 Methodological issues and validation

- 5.2.1 The Office for National Statistics (ONS) identify two methodological problems in using the LFS longitudinal datasets (Young 2001). The first is attrition bias: because some groups of individuals are more likely to drop out of the survey than others, the sample of respondents at all five quarters may not be representative of the population as a whole. To counteract this problem, ONS have devised weights, to ensure that gross flows (for example into or out of employment) are consistent with changes in stocks. These weights are applied in all bivariate analysis reported in this paper.
- 5.2.2 The other problem identified by ONS is a possible upwards bias in transition rates due to measurement error. For example, if a respondent is mis-reported as unemployed at her second interview, she might appear to move out of employment between the first and second quarters and then back again by the third quarter, when in fact she was employed throughout. The extent of this problem is still being investigated by ONS.

- 5.2.3 Estimated levels of receipt of IB in the LFS were compared to estimates derived from benefit statistics and Government Actuary's Department population forecasts. According to the latter, 4.2 per cent of the working age population were in receipt of IB (excluding credits only cases) in Autumn 2000. The same percentage reported receipt of IB in the LFS five-quarter longitudinal datasets for that quarter (with ONS weights applied).
- 5.2.4 Unfortunately a similar comparison was not possible for SSP, or for DDA disability.

5.3 An anomaly in estimates of prevalence of DDA disability

- 5.3.1 Examining DDA disability longitudinally produced some anomalous results. The prevalence of DDA disability at Wave 2 was between 1.9 and 2.9 percentage points higher than at Wave 1. Prevalence at subsequent waves was higher again, but wave on wave differences were smaller. Some increase across waves is to be expected, as sample members age by a year, but the difference between Wave 1 and Wave 2 was larger than expected. This could mean either under-representation of disability at Wave 1, or over-representation of disability at Waves 2-5.
- 5.3.2 Probing further, it became clear that the anomaly was driven by one component of the DDA definition, namely the variable HEALIM: whether the health problem or disability substantially limits day to day activities.
- 5.3.3 Furthermore, outflows from DDA disability were consistent across waves, while the inflow was higher between Waves 1 and 2 than between any other waves.
- 5.3.4 Three possible explanations were considered and rejected:
- Specific time period: the result holds across all nine panels, from Spring 98/Spring 99 to Spring 00/Spring 01.
 - Proxy response: the proportion of responses given by proxy is more or less constant across waves, so cannot explain a difference between Wave 1 and subsequent waves.
 - Weighting: the result holds whether or not ONS weights are applied.
- 5.3.5 Two further explanations were investigated and could not be rejected entirely, though they seem unlikely:
- Attrition: it is possible that those who *become* disabled between Waves 1 and 2 are more likely to continue as respondents at subsequent waves, and hence are over-represented in the five-quarter datasets. However, it is difficult to see why becoming disabled (as opposed to *being* disabled) would make an individual more likely to remain in the survey.
 - Dependent interviewing: at Waves 2 to 5, interviewers have the respondents' answers at the previous wave available to them, and can prompt accordingly. (For example, "Last time you reported a health problem or disability. Is that still the

case?”). In general, one would expect the use of dependent interviewing to *reduce* estimated transition rates, whereas in this case the inflow is unexpectedly high between Waves 1 and 2. However, there could be something specific in the wording of the dependent-interviewing script that produces a higher positive response to HEALIM. ONS are investigating this possibility.

- 5.3.6 A remaining possibility is that the difference between Wave 1 and subsequent waves is due to the mode of interviewing. Nearly all Wave 1 interviews are conducted face-to-face, while at subsequent waves, about 90 per cent are carried out over the telephone. If individuals are more likely to report disability over the telephone, that could explain the higher rates of disability at Waves 2-5. In fact, higher proportions of those interviewed face-to-face at Waves 2-5 report disability than those interviewed by telephone - though this is not conclusive evidence since there is some selection into face-to-face interviewing by disabled individuals. ONS are currently carrying out a broader investigation of modal effects.
- 5.3.7 It is not possible to determine whether the estimates of prevalence of disability produced at Waves 2-5 are more or less accurate than the estimate produced at Wave 1, since no other survey uses the DDA definition of disability. Estimates based on the cross-sectional LFS are simply an average of responses at the five waves. If the Wave 1 estimate is accurate, cross-sectional rates of disability among working-age adults in Spring 2000 are over-stated by 1.4 percentage points. If the Waves 2-5 estimates are accurate, cross-sectional rates of disability are under-stated by 0.3 percentage points.
- 5.3.8 In this report, the chief concern is with those who become disabled while in work. In the light of the difference between Wave 1 and subsequent waves, the main results were computed both with and without the inclusion of those who appear to become disabled between Waves 1 and 2. This sensitivity analysis is reported below.

5.4 Sensitivity analyses

5.4.1 DDA disabled, with and without Wave 1

Table 3A: Employees who become DDA disabled, quarter on quarter

	With Wave 1	Without Wave 1
Percent of employees	2.6	2.3
Estimated number	608,000	547,000

- The numbers becoming DDA disabled in work are slightly lower if Wave 1 is excluded.

Table 4A: Percentage remaining in employment after onset of DDA disability

Time after onset	With Wave 1	Without Wave 1
> 0 to 3 months	95	96
> 3 to 6 months	92	92
> 6 to 9 months	89	89
> 9 to 12 months	87	n/a

- Estimates of employment retention rates are unchanged by exclusion of Wave 1.

5.4.2 Trends over time

Table 3B: Percent of employees who become sick/disabled, quarter on quarter

Panel beginning...	DDA disabled	SSP/IB receipt
Spring 98	2.3	0.3
Summer 98	2.5	0.3
Autumn 98	2.5	0.3
Winter 98	2.5	0.4
Spring 99	2.7	0.3
Summer 99	2.7	0.3
Autumn 99	2.7	0.3
Winter 99	2.7	0.3
Spring 00	2.7	0.3

- Slight upwards drift in percentage of employees becoming DDA disabled, but no trend in SSP/IB receipt.

Table 4B: Employment retention following onset of sickness or disability

Panel beginning...	Percentage remaining in employment after 0-3 months:	
	DDA disability	SSP/IB receipt
Spring 98	96	79
Summer 98	94	79
Autumn 98	96	76
Winter 98	96	76
Spring 99	93	74
Summer 99	96	72
Autumn 99	95	81
Winter 99	96	78
Spring 00	96	81

- No trend in employment retention following onset of DDA disability. Employment retention immediately after onset of SSP/IB receipt appears to be lower in late 1998 and early 1999.
- Multivariate analysis of the risk of leaving employment including 'date' as an explanatory variable showed that date at onset of sickness or disability was not significant.

REFERENCES

- Bardasi, E., Jenkins, S. and Rigg, J. (2000) *Disability, Work and Income: a British perspective*. Institute for Social and Economic Research Working Paper 2000-36. Colchester: University of Essex
- Barnes, H., Thornton, P. and Maynard Campbell, S. (1998) *Disabled People and Employment: a review of research and development work*. York: York Publishing Services
- Blackburn, V., Child, C. and Hills, D. (1999) *New Deal for Disabled People: early findings from the innovative schemes*. Department for Social Security In-House Report No. 61. London: DSS
- Burchardt, T. (2000a) *Enduring Economic Exclusion: disabled people, income and work*. York: York Publishing Services
- Burchardt, T. (2000b) "The dynamics of being disabled" *Journal of Social Policy*, 29 (4): 645-668
- Dench, S. Meager, N. and Morris, S. (1996) *The Recruitment and Retention of People with Disabilities*. Institute for Employment Studies Report 301. Brighton: IES
- Morrell, J. (1990) *The Employment of People with Disabilities*. Research Paper 77. London: Employment Department
- Stafford, B. (2000) "Long-Term Illness and Impairment: who needs help with job retention?" Paper to JRF seminar on 'Job retention in the context of long-term illness'. London, 1st March
- Thomas, A. (1992) *Working with a Disability: barriers and facilitators*. London: Social and Community Planning Research
- Young, M. (2001) "Time series analyses of the Labour Force Survey two-quarter longitudinal datasets". *Labour Market Trends*, August, 399-405