

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/44648462>

Work, permanent sickness and mortality risk: A prospective cohort study of England and Wales, 1971–2006

ARTICLE *in* JOURNAL OF EPIDEMIOLOGY AND COMMUNITY HEALTH · SEPTEMBER 2011

Impact Factor: 3.5 · DOI: 10.1136/jech.2009.099325 · Source: PubMed

CITATIONS

9

READS

116

6 AUTHORS, INCLUDING:



Bola Akinwale

Imperial College London

5 PUBLICATIONS 112 CITATIONS

SEE PROFILE



Richard Wiggins

University College London

61 PUBLICATIONS 1,901 CITATIONS

SEE PROFILE



Seeromanie Harding

King's College London

120 PUBLICATIONS 2,399 CITATIONS

SEE PROFILE



Mel Bartley

University College London

183 PUBLICATIONS 5,962 CITATIONS

SEE PROFILE

Work, permanent sickness and mortality risk: a prospective cohort study of England and Wales, 1971–2006

Bola Akinwale,¹ Kevin Lynch,² Richard Wiggins,³ Seeromanie Harding,⁴ Mel Bartley,⁵ David Blane¹

► An additional appendix is published online only. To view these files please visit the journal online (<http://jech.bmj.com>).

¹Department of Primary Care and Social Medicine, Imperial College London, London, UK

²Office for National Statistics, Titchfield, Fareham, UK

³Department of Quantitative Social Science, Institute of Education, University of London, London, UK

⁴MRC Social and Public Health Sciences Unit, University of Glasgow, Glasgow, UK

⁵Department of Epidemiology and Public Health, University College London, London, UK

Correspondence to

Bola Akinwale, Department of Primary Care and Social Medicine, Imperial College London, St Dunstan's Road, London W6 8RP, UK; b.akinwale@imperial.ac.uk

Accepted 14 March 2010

Published Online First

3 June 2010

ABSTRACT

Background In recent decades, labour market participation has fallen in men, with large amounts of this decline accounted for by increases in permanent sickness. There is speculation that the rising numbers of permanently sick incorporate more people with less severe conditions than was previously the case. This paper examines the relationship between labour market position and subsequent mortality around State Pension Age.

Methods Using linked census and death records in the ONS Longitudinal Study, samples of men aged 55–69 and women aged 50–64 were selected from each decennial census, 1971–2001 and their health followed up. Differences between the employed, unemployed and economically inactive in age-specific death rates, Standardised Mortality Ratios and odds of reporting limiting long-term illness were examined.

Results Labour market activity in late middle age has changed since 1971. For example, the proportion of men employed at ages 60–64 years has fallen by 39%, and the proportion permanently sick has more than doubled. Despite this change, there has been stability in the RR of mortality between labour market positions. Working people have the lowest risk of premature death, while, relative to working people, the permanently sick continue to have mortalities around three times higher among men and four to five times higher among women.

Conclusion The evidence does not support the notion that the permanently sick are becoming less seriously ill. The persistence of the group's raised mortality suggests that measures aimed at encouraging later life employment should ensure provision of work environments suitable for people with chronic illnesses.

BACKGROUND

Socio-demographic change in historic proportions is transforming early old age in Britain. In England, life expectancy at age 65 increased by more during the final 30 years of the twentieth century than during the preceding 70 years.¹ This change is more marked among men, but it is also present among women. In addition, near-universal male employment up to the State Pension Age has been replaced by more diverse labour market participation in a deindustrialised labour market.² Only a minority of men aged 60–64 years were in paid employment around the turn of the new century, although the proportion of older workers has increased in recent years.³ At the same time, women's labour market participation increasingly resembles that of men, with a shrinking proportion being described as housewives.⁴

While these changes have been predominately beneficial, they raise issues such as how to fund pensions,⁵ prolong active ageing and maximise *Third Age* quality of life.⁶ Accordingly, at a time when labour market participation at older ages has been falling sharply, the UK government has responded with a range of initiatives to prepare for population ageing including a package of measures designed to enable people to retire later. Health is an important part of these challenges and should be given due weight in debates about the appropriate policy response. This paper, therefore, focuses on understanding whether those economically inactive nowadays are healthier than their equivalents in past decades. We examine the relationship between labour market position around the State Pension Age and subsequent mortality and morbidity in England and Wales using longitudinal data for the period 1971–2006. In the UK, State Pension Age (SPA) is currently 60 and 65 for women and men respectively. For many currently in the workforce, it will soon be 65 for both sexes, and will rise progressively for both sexes to 68 by 2046. This study has international relevance because most rich countries share the same combination of decreasing labour market participation in late middle age, and debates about the appropriate policy responses.

It is known that there is a relationship between labour market position—that is whether a person is employed, self-employed, unemployed or not looking for work—and subsequent health across the years of working life.^{7–8} Much debate has been concerned with understanding whether observed associations between labour market position and health are causal or reflect selection bias.⁹ If the relationship between labour market position and health reflects selection, poorer health among the unemployed compared with workers may reflect the fact that people in poorer health are more likely to lose their jobs, while those with better health are more likely to stay in work. Selection may also be due to factors other than health such as education level and socio-economic position,¹⁰ which are known to be independently associated with health.

At older ages, structural and cyclical changes in the economy are likely to have a significant bearing on the relationship between labour market position and health. During the 1980s and 1990s, there was a shift in the British economy away from manufacturing and heavy industry and towards services. Some have argued that low unemployment rates have been maintained since the early

1990s recession because non-employed people have been signed onto sickness benefits, excluding them from unemployment figures and increasing the numbers of people claiming sickness benefits¹¹ though active labour market programmes such as the New Deals have also reduced the claimant count in Britain. Until recently, the main benefit paid to people unable to work or seek work due to long-term illness or disability was Incapacity Benefit (IB), which is awarded to those judged not fit enough to work following structured assessments. Apart from changes in who is deemed not fit for work in the benefits regime, increases in sickness benefit claimants may also be a sign of changes in work environments that have been driven by deindustrialisation, reflecting reduced scope to move workers to lighter or less demanding duties as they age than had previously been the case.² Most people non-employed due to sickness are over 50 and more likely to have a history of manual jobs.¹¹ These people may have real health conditions which, if not prompting their labour market withdrawal, put them at the back of the queue for re-employment when coupled with their age and skill level.² The relationship between labour market position and health can therefore be viewed as reflecting relative advantage or disadvantage in individuals' occupational histories.⁹ Against this background, the present paper examines two related questions: (1) to what extent does being in work around the UK State Pension Age have a protective effect for subsequent health? (2) With increases in their relative numbers, are the permanently sick less seriously ill nowadays than was previously the case?

METHODS

Data

The present study uses data from a record linkage study, the Office for National Statistics Longitudinal Study (ONS-LS), which links census records and records of deaths, cancers and births for approximately 1% of the population of England and Wales.¹² Currently, data from each decennial census 1971 to 2001 inclusive are available in the ONS-LS, along with death registrations up to the end of 2006.

We have selected people within 10 years of the UK State Pension Age (SPA) at each census; specifically, women aged 50–59 years and men aged 55–64 years. We have examined also the health of those immediately post-SPA by including men aged 65–69 and women aged 60–64 years.

Measures

Mortality

Mortality is the primary health outcome examined in this study. Our analysis of mortality is based on follow-up of each census cohort for 5 years, taking into account any known exits from the population at risk due to emigration from England and Wales. The sample used is limited to study members who were traced in the NHS Central Register—more than 97% of the eligible sample at each census.

Limiting long-term illness

Information on morbidity comes from the census question on limiting long-term illness, which was collected first in the 1991 Census: 'Does the person have any long-term illness, health problem or handicap which limits his/her daily activities or the work he/she can do? Include problems which are due to old age.' The question was repeated in 2001 with a different wording, which referred to disability instead of handicap.

Labour market position

We use the term labour market position to refer to an individual's relationship to the labour market, where people are classified as either economically active (participating in the labour market through work or job-seeking because of unemployment) or inactive (outside the labour market due to permanent sickness, for other reasons such as family responsibilities or retirement at any age). In the 1971 and 1981 Censuses, people could classify themselves as unemployed due to temporary sickness; we have combined this small temporarily sick group with the permanently sick. Although the census measurement of labour market position has changed in other ways, it is possible to classify people into five groups that are consistent over time: in work; unemployed; retired; permanently sick; other inactive.

Social class

We adjust for socio-economic differences between the labour market positions using the Registrar General social classes, aggregated into social classes I–IIIN (non-manual) and IIIM–V (manual). In the 2001 Census, the Registrar General's classification was replaced by the National Statistics Socio-economic Classification (NS-SEC) as the official measure of social class.¹³ It is possible to allocate study members to an approximation of NS-SEC at the 1991 Census, but this is not currently an option at earlier Censuses. Therefore, for the 2001 cohort, we have used an approximation to Registrar General non-manual and manual social classes, to allow consistency with earlier cohorts.¹⁴ Women have been assigned a social class according to the occupation of the head of their household; this is typically the woman's own occupation for never married, divorced and widowed women and the spouses' occupation for married women.

Statistical analysis

For each cohort, we measure labour market position recorded at the census and relate it to subsequent health. To examine differences in mortality between groups, we calculate age-specific mortality rates by labour market position for each census cohort. Relative differences in mortality are examined using RRs, calculated with Cox regression, and using Standardised Mortality Ratios (SMRs). For each cohort, the gender-specific death rates used for standardisation of SMRs are those of people in work. Logistic regression equations are used to model the risk of limiting long-term illness adjusted for social class. Statistically significant differences between groups are determined by observing non-overlapping CIs.

Sensitivity analysis

To investigate possible selection bias into the different labour market positions, deaths in the first 5 years after each census were ignored, and only deaths during the postcensus years 6–10 were included in sensitivity analyses. Allowing in this way for the possibility that ill people are more likely to enter certain labour market positions⁹ (wearing off of selection) increases confidence in the mortality differentials identified.¹⁵ As the ONS-LS's most recent mortality linkage is 2006, it was not possible to use this method for the 2001 Census.

RESULTS

Since 1971, there has been a substantial change in distribution of labour market position around the State Pension Age. Table 1 shows a pattern of increasingly early labour market withdrawal. For example, the proportion of men in work at ages 60–64 years has fallen markedly, from 78.4% in 1971 to 47.5% in 2001. Correspondingly, the proportion of men retired at ages 60–64 has

Table 1 Percentage distribution of labour market position by age group and census

Labour market position and census	Men				Women			
	55–59	60–64	65–69	N	50–54	55–59	60–64	N
In work								
1971	90.4	78.4	29.5	28541	56.3	48.9	27.4	21377
1981	82.2	62.7	16.9	22519	60.6	49.0	21.4	20179
1991	70.2	48.8	12.7	17958	63.2	49.2	21.9	19202
2001	70.7	47.5	13.8	19149	68.9	54.9	25.5	25681
Unemployed								
1971	3.0	5.1	0.5	1255	1.6	1.5	0.6	604
1981	7.9	10.1	0.2	2518	2.3	2.1	0.2	711
1991	8.9	8.2	0.3	2377	3.5	3.1	0.3	975
2001	3.3	3.0	0.5	980	1.9	1.5	0.4	664
Retired								
1971	1.3	7.2	68.4	8938	1.8	5.6	28.1	5629
1981	1.6	13.9	79.1	11623	0.5	2.5	20.3	3454
1991	6.3	23.2	80.6	13842	2.2	8.9	49.9	8654
2001	8.7	24.7	78.3	14147	2.6	10.2	61.6	10647
Permanently sick								
1971	5.0	9.0	1.3	2186	2.6	3.4	1.4	1189
1981	7.9	13.0	3.4	3304	3.1	4.2	2.3	1471
1991	13.8	19.0	5.9	5207	7.2	9.2	4.5	2967
2001	13.0	19.7	5.7	5392	9.3	12.4	5.7	4569
Other inactive								
1971	0.2	0.3	0.3	113	37.7	40.6	42.5	19436
1981	0.3	0.4	0.4	138	33.5	42.3	55.9	20056
1991	0.9	0.9	0.5	309	24.0	29.6	23.4	10963
2001	4.2	5.1	1.9	1577	17.3	21.1	6.8	7662

Source: ONS Longitudinal Study, authors' analysis.

risen, from 7.2% in 1971 to 24.7% in 2001, while the proportion permanently sick has more than doubled, from 9.0% to 19.7%.

Among women at the ages examined here, the other inactive group, mostly housewives, has decreased in size relative to other groups. Below the State Pension Age (SPA), considerable reductions in the proportions recorded as other inactive have coincided with large increases in the proportions in work. By 2001, women (61.6%) were almost as likely as men (78.3%) to describe themselves as retired after the State Pension Age. Like men, the proportion of women who are permanently sick has increased steadily in the pre-SPA decade of life. For example, among women aged 55–59 years, the proportion permanently sick rose from 3.4% in 1971 to 12.4% in 2001.

Table 2 shows the relationship between labour market position and mortality using age-specific death rates. There were substantial decreases in the absolute risk of death in all groups over the period 1971–2001; for example, there was a 66.1% fall in the mortality of men in work at ages 60–64. Retired men and women had the largest absolute reductions in mortality between 1971 and 2001, particularly among people who were approaching the State Pension Age (around 73% for men aged 60–64 and 70% for women aged 55–59). Despite these sizeable reductions in absolute mortality, the pattern of relative mortality risk remained remarkably stable during 1971–2001, being persistently lowest among those in work and highest among the permanently sick for both men and women at working ages (there were a few exceptions, where CIs overlap).

Such stability in the RR of mortality by labour market position is illustrated in table 3, which shows for each age-specific group, relative risks of mortality using people in work as the reference category. Working people consistently had the lowest risk of mortality; in the small number of cases where the mortality of a group was lower than working people—for

example, unemployed men at ages 65–69—these differences were not statistically significant. Mostly, the mortalities of permanently sick men were around three times higher than those of men in work; and significantly higher than those of the other labour market groups. Likewise, permanently sick women had mortalities typically four to five times higher than women in work depending on census and age-specific group.

Along with changes in the distribution of groups in the labour market, there was some change in the RR of mortality for groups falling between the lowest mortality of working people, and the highest of the permanently sick. Table 4 shows Standardised Mortality Ratios (SMRs) by labour market position for people in the 10 years approaching State Pension Age. In 1971, the mortality of retired men (SMR=175) and women (SMR=211) was significantly raised compared with working people. Over the period 1971–2001, large reductions in absolute mortalities among retired people reduced their relative mortality risk to the extent that, by 2001, only working people had lower mortalities than retired people. Among men, the relative mortality risk of those in the other inactive group fell also over the period, at a time when the mortality of unemployed men increased relative to those in work. Among women, the relative mortality of those other inactive or unemployed was higher by 2001 compared with earlier decades.

Table 5 reports the odds of limiting long-term illness 10 years after the census for men and women in the various labour force positions at the 1981 and 1991 Censuses. The overall pattern is the same as for mortality; namely, the best health among those in work, greatly increased odds of subsequent limiting long-term illness among the permanently sick and somewhat worse health than those in work among the other labour market groups.

Our sensitivity analysis did not alter significantly the substantive findings. During years 6–10 postcensus, among

Table 2 Age-specific mortality rates of men and women around State Pension Age (SPA), 1971–2001

Sex, age group and census	Labour market position									
	In work		Unemployed		Retired		Permanently sick		Other inactive	
	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI
Men										
55–59										
1971	181	171 to 191	215	162 to 285	408	294 to 565	627	546 to 720	427	204 to 896
1981	148	139 to 158	193	160 to 233	398	103 to 175	489	261 to 333	334	159 to 701
1991	97	89 to 106	139	112 to 172	134	428 to 560	295	733 to 892	134	67 to 267
2001	62	56 to 69	100	68 to 148	89	173 to 218	222	387 to 463	97	68 to 138
Change 1971–2001	–66%		–53%		–78%		–65%		–77%	
60–64										
1971	290	276 to 305	328	272 to 396	490	428 to 560	809	733 to 892	659	365 to 1189
1981	217	203 to 233	214	180 to 254	301	266 to 341	617	561 to 678	439	229 to 844
1991	149	136 to 163	188	154 to 229	194	173 to 218	424	387 to 463	245	145 to 414
2001	98	88 to 110	141	98 to 205	131	114 to 150	294	265 to 326	182	141 to 235
Change 1971–2001	–66%		–57%		–73%		–64%		–72%	
65–69										
1971	421	389 to 455	266	127 to 558	622	595 to 650	966	728 to 1282	531	253 to 1114
1981	294	262 to 330	198	64 to 614	473	452 to 494	899	763 to 1059	454	236 to 872
1991	243	209 to 281	680	354 to 1307	381	363 to 400	702	612 to 805	460	261 to 810
2001	167	140 to 198	112	36 to 346	243	229 to 258	591	508 to 688	263	180 to 383
Change 1971–2001	–60%		–58%		–61%		–39%		–51%	
Women										
50–54										
1971	59	52 to 67	79	43 to 147	139	89 to 218	226	167 to 305	67	58 to 77
1981	46	40 to 53	53	28 to 102	231	120 to 444	180	132 to 246	73	63 to 84
1991	25	21 to 30	36	19 to 69	102	62 to 166	145	115 to 183	38	30 to 49
2001	25	22 to 29	27	11 to 65	24	11 to 54	88	71 to 110	49	39 to 60
Change 1971–2001	–57%		–66%		–83%		–61%		–28%	
55–59										
1971	86	77 to 96	109	63 to 188	177	142 to 220	366	299 to 449	110	99 to 122
1981	68	61 to 77	94	57 to 156	149	103 to 216	324	265 to 395	104	94 to 116
1991	50	43 to 58	114	77 to 171	71	52 to 95	196	164 to 235	67	57 to 80
2001	37	31 to 43	138	85 to 225	54	40 to 73	178	153 to 207	56	45 to 68
Change 1971–2001	–57%		26%		–70%		–51%		–49%	
60–64										
1971	119	105 to 134	150	72 to 315	200	181 to 220	604	460 to 792	180	166 to 196
1981	100	85 to 117	NA	0 to 0	185	164 to 209	464	365 to 589	161	149 to 174
1991	90	76 to 106	NA	0 to 0	149	137 to 163	439	368 to 525	106	91 to 123
2001	65	54 to 79	NA	0 to 0	102	93 to 112	390	330 to 461	103	77 to 137
Change 1971–2001	–45%				–49%		–35%		–43%	

Source: ONS Longitudinal Study, authors' analysis. Rates per 10 000. Deaths 1–5 years after census.

Deaths in each Census year are not included.

Mortality follow-up periods : 1971 Census, 1972–1976; 1981 Census, 1982–1986; 1991 Census, 1992–1996; 2001 Census, 2002–2006.

both men and women, the mortality of those in work was lowest, and the permanently sick had the highest rate, with intermediate mortality rates for the other three labour market groups. Of contemporary interest, the mortality disadvantage of the unemployed when compared with those in work was revealed by this sensitivity analysis, because it allowed health selection into the labour market to wear off^{16–18} (See online appendix 1).

DISCUSSION

The years of the ONS Longitudinal Study cover profound changes in British society. The first data in 1971 belong to the post-World War II settlement of full employment among men, who mostly worked until the State Pension Age, with a large proportion of women describing themselves as housewives. Subsequent census linkages have recorded deindustrialisation,¹⁹ globalisation,²⁰ feminisation of the workforce²¹ and growing labour market exit before the State Pension Age.²² In parallel with these changes, the study's linkage to death registration has revealed quite remarkable

reductions in middle-aged mortality, mostly of around 60%, depending on age, gender and labour market position.

Given the scale of these changes, the comparative stability of the relative mortality risk attached to each labour market position is equally striking, including the long-term raised risk attached to unemployment among men, and the significant advantage associated with work. One change of note, however, is that marked increases in the proportions retired, before the State Pension Age, have occurred with falls in the absolute and relative mortality of the group. This has implications for the observed mortalities of the employed, and the permanently sick because those who retire early due to ill health are likely to be selected out of the labour market, into permanent sickness. Of particular interest for the present purposes is the situation of the permanently sick. They have increased as a proportion of the population in the decade before the State Pension Age,²³ at which ages their absolute mortality has fallen significantly as they appear to have benefited from general increases in life expectancy. Nevertheless, while absolute death rates of the permanently sick have fallen, their

Table 3 Relative risks (RR) of mortality by labour market position (reference group: in work) for men and women around State Pension Age, 1971–2001

Sex, age group and census	Labour market position							
	Unemployed		Retired		Permanently sick		Other inactive	
	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI
Men								
55–59								
1971	1.18	0.88 to 1.57	2.19	1.57 to 3.04	3.45	2.97 to 4.01	2.36	1.12 to 4.96
1981	1.30	1.06 to 1.58	2.63	1.94 to 3.58	3.23	2.80 to 3.72	2.16	1.02 to 4.55
1991	1.41	1.12 to 1.79	1.34	1.02 to 1.78	2.99	2.57 to 3.48	1.37	0.68 to 2.76
2001	1.60	1.07 to 2.40	1.39	1.05 to 1.83	3.50	2.95 to 4.17	1.54	1.07 to 2.23
60–64								
1971	1.11	0.91 to 1.35	1.61	1.39 to 1.86	2.75	2.46 to 3.07	2.31	1.28 to 4.19
1981	0.97	0.80 to 1.16	1.31	1.12 to 1.51	2.79	2.48 to 3.14	1.95	1.01 to 3.77
1991	1.24	1.00 to 1.54	1.23	1.06 to 1.43	2.76	2.43 to 3.14	1.63	0.96 to 2.78
2001	1.43	0.97 to 2.11	1.28	1.08 to 1.53	2.94	2.52 to 3.42	1.81	1.37 to 2.40
65–69								
1971	0.62	0.29 to 1.32	1.46	1.34 to 1.60	2.31	1.72 to 3.10	1.24	0.59 to 2.61
1981	0.63	0.20 to 1.97	1.62	1.43 to 1.83	3.10	2.53 to 3.78	1.57	0.80 to 3.05
1991	2.86	1.47 to 5.59	1.52	1.30 to 1.77	2.94	2.41 to 3.60	1.84	1.03 to 3.30
2001	0.67	0.21 to 2.10	1.42	1.18 to 1.70	3.51	2.79 to 4.41	1.54	1.02 to 2.33
Women								
50–54								
1971	1.34	0.71 to 2.52	2.31	1.45 to 3.68	3.78	2.72 to 5.23	1.13	0.94 to 1.36
1981	1.16	0.59 to 2.26	4.80	2.46 to 9.37	3.82	2.71 to 5.38	1.56	1.27 to 1.91
1991	1.43	0.73 to 2.82	3.81	2.25 to 6.45	5.70	4.23 to 7.66	1.51	1.12 to 2.05
2001	1.08	0.44 to 2.62	0.89	0.39 to 2.02	3.43	2.63 to 4.51	1.90	1.45 to 2.47
55–59								
1971	1.28	0.74 to 2.23	1.95	1.52 to 2.50	4.22	3.35 to 5.31	1.26	1.09 to 1.46
1981	1.37	0.81 to 2.31	2.05	1.39 to 3.04	4.64	3.67 to 5.86	1.50	1.28 to 1.76
1991	2.24	1.46 to 3.44	1.30	0.93 to 1.83	3.83	3.03 to 4.85	1.30	1.04 to 1.64
2001	3.75	2.24 to 6.27	1.38	0.98 to 1.93	4.75	3.82 to 5.91	1.49	1.15 to 1.93
60–64								
1971	1.27	0.60 to 2.70	1.60	1.37 to 1.88	5.14	3.81 to 6.93	1.48	1.28 to 1.73
1981	0	0 to 0	1.80	1.47 to 2.19	4.58	3.44 to 6.11	1.57	1.31 to 1.87
1991	0	0 to 0	1.59	1.31 to 1.92	4.91	3.84 to 6.27	1.15	0.92 to 1.44
2001	0	0 to 0	1.49	1.21 to 1.83	5.97	4.65 to 7.67	1.56	1.11 to 2.19

Source: ONS Longitudinal Study, authors' analysis. Deaths 1–5 years after census.

Deaths in each census year are not included.

Mortality follow-up periods: 1971 Census, 1972–1976; 1981 Census, 1982–1986; 1991 Census, 1992–1996; 2001 Census, 2002–2006.

Adjusted for single year of age.

relative mortality risk compared with people in work has changed little among both men and women.

The policy implications of these findings depend on the choice of comparator group. If one compares the permanently sick with

their historical predecessors, their health is better. If one compares the permanently sick with their employed contemporaries, their health continues to be markedly worse, and this health gap has not changed since 1971.

Table 4 Standardised Mortality Ratios for men aged 55–64 and women aged 50–59: 1971–2001

Labour market position	Men aged 55–64			
	1971	1981	1991	2001
In work	100	100	100	100
Unemployed	115 (98 to 134)	110 (97 to 125)	133 (115 to 154)	151 (116 to 198)
Retired	175 (155 to 198)	149 (133 to 167)	131 (118 to 146)	135 (120 to 152)
Permanently sick	298 (275 to 323)	299 (277 to 322)	290 (270 to 312)	318 (293 to 346)
Other inactive	230 (145 to 366)	212 (130 to 346)	153 (101 to 233)	174 (142 to 214)
Labour market position	Women aged 50–59			
	1971	1981	1991	2001
In work	100	100	100	100
Unemployed	130 (86 to 196)	129 (86 to 192)	197 (140 to 277)	236 (154 to 362)
Retired	211 (173 to 257)	252 (183 to 348)	171 (132 to 220)	138 (104 to 182)
Permanently sick	411 (347 to 487)	446 (377 to 528)	445 (386 to 513)	432 (381 to 490)
Other inactive	122 (113 to 133)	154 (142 to 168)	140 (122 to 160)	168 (145 to 195)

Source: ONS Longitudinal Study, authors' analysis. Deaths 1–5 years after census.

Reference category is 'In work.' Mortality follow-up periods: 1971 Census, 1972–1976; 1981 Census, 1982–1986; 1991 Census, 1992–1996; 2001 Census, 2002–2006.

Table 5 ORs (95% CI) for limiting long-term illness at next census: men aged 55–64 and women aged 50–59, 1981 and 1991

Labour market position	Men		Women	
	1981	1991	1981	1991
In work	1.00	1.00	1.00	1.00
Unemployed	1.28 (1.15 to 1.41)	1.31 (1.17 to 1.45)	1.68 (1.40 to 2.03)	1.60 (1.37 to 1.86)
Retired	1.45 (1.28 to 1.64)	1.24 (1.14 to 1.36)	1.47 (1.16 to 1.86)	1.29 (1.14 to 1.46)
Permanently sick	8.37 (7.26 to 9.64)	8.11 (7.25 to 9.07)	13.52 (11.25 to 16.24)	11.75 (10.28 to 13.43)
Other inactive	1.26 (0.71 to 2.23)	1.12 (0.82 to 1.54)	1.46 (1.37 to 1.55)	1.44 (1.35 to 1.53)

Source: ONS Longitudinal Study, authors' analysis. Adjusted for age and social class.

Strengths

This study used a large, nationally representative sample, with minimal non-response and very little loss to follow-up. The data set covers the period of deindustrialisation in Britain, from the 1971 industrial economy and post-World War II social settlement (eg, Beveridge reforms and family wage) to the globalised social and economic conditions of 2001, which is also the period during which life expectancy at middle age and patterns of labour market participation were transformed for the age groups under study. The changes analysed are local manifestations of international phenomena.

Weaknesses

1. Mortality, which is the main health outcome of the study, is a poor indicator of health, because the concept of health implies more than mere existence. Also, mortality ignores diseases such as osteo-arthritis, which are major causes of serious morbidity that rarely result in death. These points are answered to some extent by the study's second health outcome measure—limiting long-term illness. Although the measure was included in only the two most recent Censuses, it is reassuring that variation in limiting long-term illness is consistent with that of mortality by labour market position.
2. Measurement of labour market position in the data set is made at Census, only once every 10 years, so nothing is known about intercensal working life. Substantial intercensal mobility between labour market positions could dilute the strength of the study's observed relationships, although as a result, the present study's results would be conservative estimates.
3. Health selection into the various labour market positions may mean that the associations are short-term phenomena, without long-term significance. We have tried to estimate this effect in a sensitivity analysis which excluded deaths

during the first 5 years of follow-up, on the assumption that the majority of those forced out of employment by acute, serious illness will have a low 5-year survival (our analysis of mortality after the 2001 Census was unable to include this safeguard, because of the short follow-up time). The size of the relative mortality disadvantage of the permanently sick, compared with those in work, was reduced somewhat by allowing in this way for the wearing off of selection, but the pattern of mortality risk by labour market position remained unchanged. The worse health of the permanently sick is a long-term phenomenon.

4. Our study examined only the years around the State Pension Age. Other studies are required of younger age groups.

Conclusions

During the period 1971–2001, health at older working ages improved greatly for those in all labour market positions: employed, unemployed, retired, permanently sick or other inactive. A large increase in the proportions of men and women who were economically inactive due to long-term sickness would be expected to result in a dilution of mortality differences between this group and the employed. However, despite a reduction in the absolute mortalities of the permanently sick, no reduction in their RR of mortality was seen compared with those in work. Any attempts to encourage older, sick people back to work will need to ensure a supply of jobs with work environments suitable for people with chronic illnesses. This should inform further development of the new sickness benefit, Employment Support Allowance.

Acknowledgements We acknowledge, with gratitude, the support of our colleagues at the Office for National Statistics. This work contains statistical data from ONS which are Crown copyright and reproduced with the permission of the controller of HMSO and Queen's Printer for Scotland. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates.

Funding The work is funded by UK Research Council's Programme New Dynamics of Ageing (Award Number RES-352-25-0015) and ESRC International Centre for Life Course Studies in Society and Health (Award Number RES-596-28-0001).

Competing interests None.

Contributors The idea for the research originated from discussions between the authors and staff at the Office for National Statistics. All authors contributed to the study design and analysis and interpretation of results. The study was led by DB, who is guarantor for the paper. BA undertook the analysis. All authors drafted the article and approved the final version.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

1. **Office for National Statistics.** Period expectations of life from English life tables Nos. 01 to 16. <http://www.statistics.gov.uk/statbase/Product.asp?vlnk=333> (accessed Aug 2009).
2. **Beatty C, Fothergill S.** The diversion from 'unemployment' to 'sickness' across British regions and districts. *Reg Stud* 2005;**39**:837–54.

What is already known on this topic

- ▶ The permanently sick have increased as a proportion of the population around the State Pension Age.

What this study adds

- ▶ Despite large increases in the relative size of the permanently sick, there has been no reduction in their mortality relative to other groups.
- ▶ Policies aimed at encouraging later life employment will need to ensure a supply of jobs with work environments suitable for people with chronic health conditions.

3. **OECD.** Labour Force Survey by sex and age, 2000–2007. <http://stats.oecd.org/index.aspx> (accessed Sep 2008).
4. **Scott J.** Family change: revolution or backlash in attitudes? In: McRae S, ed. *Changing Britain: families and households in the 1990s*. Oxford: Oxford University Press, 1999:98–119.
5. **Pensions Commission.** *Pensions: challenges and choices. The First Report of the Pensions Commission*. London: The Stationery Office, 2004:1–26.
6. **HM Government.** Opportunity Age: Meeting the challenges of ageing in the 21st century. First Report. Volume One, 2005. <http://www.dwp.gov.uk/policy/ageing-society/strategy-and-publications/opportunity-age-first-report/volume-1/> (accessed Apr 2009).
7. **Bartley M,** Popay J, Plewis I. Domestic conditions, paid employment and women's experience of ill-health. *Social Health & Illn* 1992;**14**:313–43.
8. **Kasl SV,** Jones BA. The impact of job loss and retirement on health. In: Berkman L, Kawachi I. *Social epidemiology*. Oxford: Oxford University Press, 2000:118–36.
9. **Bartley M.** Unemployment and health—selection or causation—a false antithesis? *Social Health Illn* 1988;**10**:41–67.
10. **Martikainen PT.** Unemployment and mortality among Finnish men, 1981–5. *BMJ* 1990;**301**:407–11.
11. **Fothergill S,** Wilson I. A million off incapacity benefit: How achievable is Labour's target? *Cambridge J Econ* 2007;**31**:1007–23.
12. **Hattersley L,** Creeser R. *Longitudinal study 1971–1991: history, organisation and quality of data*. London: HMSO, 1995:1.
13. **Rose D,** Pevalin DJ. The NS-SEC explained. In: Rose D, Pevalin DJ, eds. *A researcher's guide to the national statistics socio-economic classification*. London: Sage, 2003:28–44.
14. **Blackwell L,** Akinwale B, Antonatos A, *et al.* Opportunities for new research using the post-2001 ONS longitudinal study. *Popul Trends* 2005;**121**: 8–16.
15. **Fox AJ,** Goldblatt PO, Adelstein AM. Selection and mortality differentials. *J Epidemiol Community Health* 1982;**36**:69–79.
16. **Moser KA,** Goldblatt PO, Fox AJ, *et al.* Unemployment and mortality. *BMJ (Clin Res Ed)* 1987;**294**:1353.
17. **Moser KA,** Goldblatt PO, Fox AJ, *et al.* Unemployment and mortality: comparison of the 1971 and 1981 longitudinal study census samples. *BMJ (Clin Res Ed)* 1987;**294**:86–90.
18. **Bethune A.** Economic activity and mortality of the 1981 Census cohort in the OPCS Longitudinal Study. *Popul Trends* 1996;**83**:37–42.
19. **Mitchell R,** Gleave S, Bartley M, *et al.* Do attitude and area influence health? A multilevel approach to health inequalities. *Health Place* 2000;**6**:67–79.
20. **Hoggart K,** Hiscock C. Occupational structures in service-class households: comparisons of rural, suburban, and inner-city residential environments. *Environ Plan A* 2005;**37**:63–80.
21. **Blackwell L.** Gender and ethnicity at work: Occupational segregation and disadvantage in the 1991 British Census. *Sociology* 2003;**37**:713–31.
22. **Fieldhouse E,** Hollywood E. Life after mining: Hidden unemployment and changing patterns of economic activity amongst miners in England and Wales, 1981–1991. *Work, Employment and Society* 1999;**13**:483–502.
23. **Leaker D.** Economic inactivity. *Econ Labour Market Rev* 2009;**3**: 42–6.

Advancing Postgraduates. Enhancing Healthcare.

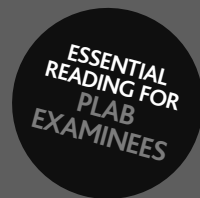
The *Postgraduate Medical Journal* is dedicated to advancing the understanding of postgraduate medical education and training.

- Acquire the necessary skills to deliver the highest possible standards of patient care
- Develop suitable training programmes for your trainees
- Maintain high standards after training ends

Published on behalf of the fellowship for Postgraduate Medicine

FOR MORE DETAILS OR TO SUBSCRIBE,
VISIT THE WEBSITE TODAY

postgradmedj.com



BMJ Journals