CHANGES IN SOCIO-ECONOMIC INEQUALITIES IN CENSUS MEASURES OF HEALTH IN ENGLAND AND WALES, 1991-2001

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ABSTRACT

Study objectives To investigate changes in socio-economic inequalities in census measures of health in England and Wales between 1991 and 2001.

Design Indirect standardisation was used to calculate age standardised rates of limiting long term illness and permanent sickness in men and women in all residential wards in England and Wales in 1991 and 2001. The socio-economic position of each ward was determined using Townsend Deprivation Scores.

Setting All residential wards in England and Wales in 1991 and 2001.

Participants All individuals aged 16-65 who provided census information in the 1991 or 2001 censi.

Main results There was strong evidence that TDS quintile could predict both logged standardised permanent sickness rate and logged standardised limiting long-term illness rate. There was evidence that socio-economic inequalities in standardised limiting long-term illness rates decreased between 1991 and 2001 in both men and women and that socio-economic inequalities in standardised permanent sickness rates decreased in women but increased in men between 1991 and 2001.

Conclusions As permanent sickness rates appear to reflect labour market accessibility, we may have found evidence that socio-economic inequalities in self reported morbidity decreased but inequalities in labour market participation in men increased between 1991 and 2001.

Socio-economic inequalities in health (SEIH) have been well documented across the world using numerous different methods and definitions of both socio-economic position and health.[1][2][3][4][5][6] Whilst the existence of SEIH is now rarely disputed, recent changes in the relationship between socio-economic position and health, if any, are not clear with reports of increasing, decreasing and stable socio-economic inequalities in morbidity and mortality over recent years in developed countries.[7][8][9]

In the UK, a population census is conducted every 10 years. In 1991, a question on individual health was included for the first time. This asked "Do you have any long-term limiting illness, health problem or disability which limits your daily activities or the work you can do? Include problems which are due to old age" and was repeated in the 2001 census. In addition, the 1991 and 2001 censi both collected information on reasons for not working, including "permanent sick or disabled". Using Townsend Deprivation Scores (TDS)[2], a census derived area measure of material deprivation, we investigated changes in socio-economic inequalities in census measures of health in England and Wales between 1991 and 2001.

METHODS

All data was downloaded from the National Statistics website (http://www.nomisweb.co.uk/). Age standardised limiting long term illness (LLTI) and permanent sickness rates for men and women aged 16-64 were calculated for each electoral ward in England and Wales in 1991 and 2001 by indirect standardisation, using age specific rates for England and Wales as a whole. In 1991, data on LLTI referred to individuals living in households only whilst in 2001 all individuals were included. Data was available for more and narrower age ranges in 2001 than 1991. Reassignment of 2001 data to 1991 age ranges had very little effect on the results and published age ranges were used throughout (see appendix).

As the LLTI question emphasises problems of old age, it has been argued that it is biased towards older people.[10] To aid comparability and overcome this problem to some degree, we restricted all analyses to individuals aged 16-64. The TDS of all wards were calculated as previously described.[2] Wards were grouped into quintiles of deprivation for analysis. As

the distributions of standardised LLTI and standardised permanent sickness rates were skewed, both measures of health were log transformed for analysis. The relationship between logged measures of health and quintiles of TDS was investigated in men and women in each year using linear regression. Likelihood ratio tests comparing models with and without interaction terms were used to investigate whether there was evidence that the relationship between TDS quintiles and the measures of health varied between 1991 and 2001. Because of boundary changes between 1991 and 2001, it was not considered feasible to disaggregate data by region.

RESULTS

Data was downloaded for 10 746 wards in 1991 and 8800 in 2001. There was strong evidence that TDS quintile could predict both logged standardised permanent sickness rate and logged standardised LLTI rate in 1991 and 2001 in both men and women (see table). The figure shows mean standardised permanent sickness and LLTI rates by TDS quintiles in 1991 and 2001 for men and women (data in the figure is not logged in order to ease interpretation).

The table and figure suggest that socio-economic inequalities in standardised permanent sickness rates increased over time in men. Whilst rates in four quintiles decreased, this decreased was most marked in the more affluent quintiles. In contrast, socio-economic inequalities in standardised permanent sickness rates decreased over time in women due to increases in permanent sickness rates in all quintiles most marked in the most deprived quintile. Standardised LLTI rates decreased between 1991 and 2001 in both men and women due to small increases in the most affluent quintiles but more marked decreases in the most deprived quintiles.

Likelihood ratio tests confirmed that the relationship between TDS quintile and both measures of health varied significantly between 1991 and 2001 (permanent sickness: χ^2=33.16 in men, χ^2=47.61 in women; LLTI: χ^2=99.87 in men, χ^2=152.10 in women; p<0.001 in both cases).

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Table – linear regression of Townsend Deprivation Score and age standardised permanent sickness and limiting long term illness rates in men and women, electoral wards in England and Wales, 1991 and 2001

	Limiting long term illness		Permanent sickness	
	regression coefficient (95% confidence intervals)	p-value	regression coefficient (95% confidence intervals)	p-value
1991, men	0.209 (0.205 to 0.212)	<0.001	0.307 (0.300 to 0.313)	<0.001
2001, men	0.185 (0.181 to 0.188)	<0.001	0.328 (0.321 to 0.335)	<0.001
1991, women	0.200 (0.188 to 0.196)	<0.001	0.318 (0.311 to 0.325)	<0.001
2001, women	0.172 (0.169 to 0.176)	<0.001	0.298 (0.291 to 0.304)	<0.001

Figure – mean age standardised permanent sickness and limiting long term illness rates in men and women by quintiles of Townsend Deprivation Score, electoral wards in England and Wales, 1991 and 2001
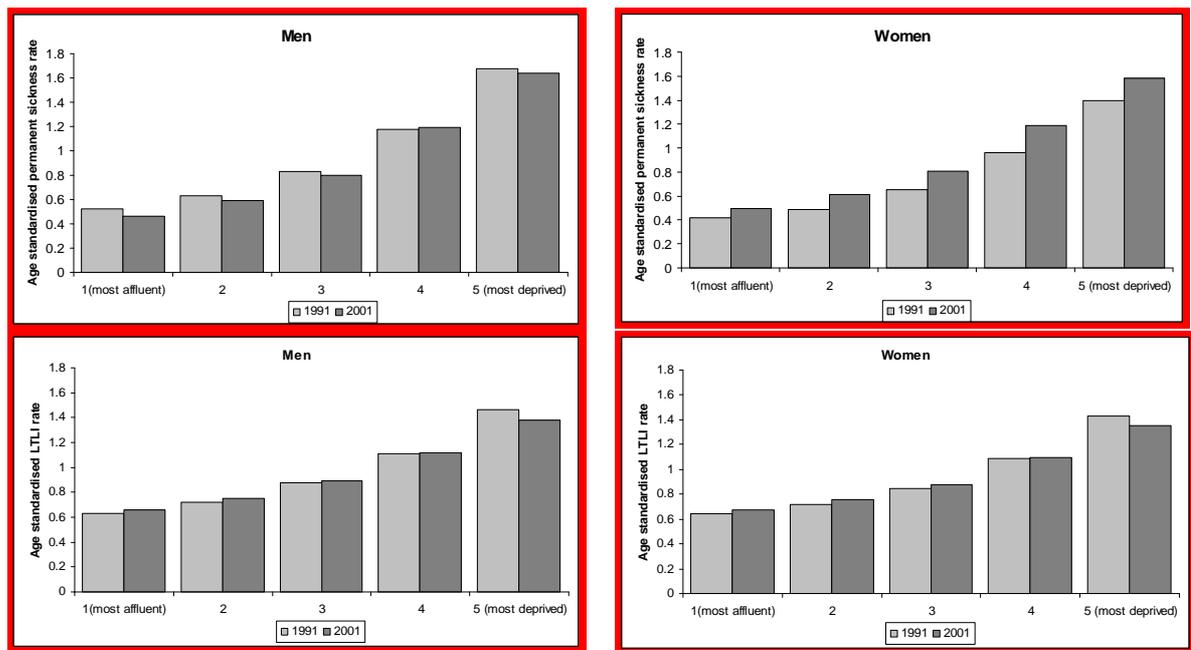
DISCUSSION

Using UK census data, we have found strong evidence of socio-economic inequalities in both standardised LLTI and permanent sickness rates amongst working age men and women in England and Wales at the ward level in both 1991 and 2001. In addition, there was evidence that socio-economic inequalities in standardised LLTI rates decreased in both men and women between 1991 and 2001 along with those in permanent sickness in women, whilst

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socio-economic inequalities in permanent sickness in men increased. Our data is entirely area level and our findings cannot necessarily be applied at the individual level nor are they necessarily generalisable to other parts of the UK.

It has been suggested that census LLTI rates are more a marker of the proportion of the population that is elderly, rather than the morbidity burden in a community.[10] By restricting the data to individuals aged 16-64, our measure of LLTI rates may be a stronger marker of morbidity than previously used. In contrast, permanent sickness rates in the UK may to be particularly vulnerable to fluctuations in the labour market.[11] There is accumulating evidence that those finding it hard to gain employment, particularly the unskilled, increasingly opt out of the labour market and into permanent sickness[12][13] – with current financial incentives in favour of incapacity benefit (the main health related benefit for working aged people) compared to jobseeker's allowance (a means test benefit paid to those actively seeking employment) (see

http://www.dwp.gov.uk/lifeevent/benefits/atoz.asp for current benefit rates). However, it is worth noting that the census question used to enumerate permanent sickness does not define permanent sickness in terms of receipt of health related benefits, or otherwise. Whilst most, if not all, of those of working age not working and claiming health related benefits are likely to identify themselves as permanently sick, this category may include others who are not working but not claiming such benefits. As the census asks individuals to identify as many reasons for not working as applicable, including permanent sickness and retirement, early retirement due to ill health should not have unduly effected the results.

Our findings may appear somewhat contradictory with evidence of both increasing and decreasing SEIH – albeit small differences in both cases. Data supporting both findings have been previously published.[7][8][9] Our results may suggest that socio-economic inequalities in self reported morbidity amongst working age adults have decreased in England and Wales between 1991 and 2001, but that socio-economic inequalities in labour market participation have increased in men but not women. This may be due to decrease in demand for unskilled

labour – traditionally male work,[12] and increasing demand for skilled routine workers – traditionally female work.[14] Economic policies and events, including the 1990s recession may also have contributed to these findings. Alternatively, it is possible that there has been little consistent and wholescale change in SEIH over recent years with large sample sizes lending statistical significance to small absolute, and possibly unimportant, changes.

ACKNOWLEDGEMENTS

WHAT THIS PAPER ADDS

Using UK census data, we have found evidence that whilst socio-economic inequalities in standardised limiting long term illness rates decreased in men and women between 1991 and 2001, those in permanent sickness in men increased.

POLICY IMPLICATIONS

There is limited evidence that recent government policies have led to decreases in socio-economic inequalities in census measures of health.

ETHICS, RESEARCH GOVERANCE AND COMPETING INTERESTS

Ethical approval was not required for this secondary analysis of anonymised, publicly available data. No author is aware of any competing interests in relation to this article.

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APPENDIX

Age ranges used for reporting permanent sickness and limiting long term illness rates in electoral wards in 1991 and 2001 censi.

	1991	**2001**
Limiting long term illness	16-29 30-44 45-59 60-64	16-17 18-19 20-24 25-29 30-34 35-39 40-44 45-49 50-54 55-59 60-64
Permanent sickness	16-19 20-24 25-29 30-34 35-44 45-54 55-59 60-64	16 17 18 19 20-24 25-29 30-34 35-39 40-44 45-49 50-54 55-59 60-64