SHORT REPORT

Changes in socioeconomic inequalities in census measures of health in England and Wales, 1991–2001

Jean Adams, Laura Holland, Martin White

J Epidemiol Community Health 2006;60:218–220. doi: 10.1136/jech.2005.040998

Study objectives: To investigate changes in socioeconomic 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 socioeconomic position of each ward was determined using Townsend deprivation scores.

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

Participants: All people aged 16–65 who provided census information in the 1991 or 2001 censuses.

Main results: There was strong evidence that Townsend deprivation score quintile could predict both logged standardised permanent sickness rate and logged standardised limiting long term illness rate. There was evidence that socioeconomic inequalities in standardised limiting long term illness rates decreased between 1991 and 2001 in both men and women and that socioeconomic inequalities in standardised permanent sickness rates decreased in women but increased in men between 1991 and 2001.

Conclusions: As permanent sickness rates seem to reflect labour market accessibility, this study may have found evidence that socioeconomic inequalities in self reported morbidity decreased but inequalities in labour market participation in men increased between 1991 and 2001.

Socioeconomic inequalities in health (SEIH) have been well reported across the world using numerous different methods and definitions of both socioeconomic position and health.^{1–6} While the existence of SEIH is now rarely disputed, recent changes in the relation between socioeconomic position and health, if any, are not clear with reports of increasing, decreasing, and stable socioeconomic inequalities in morbidity and mortality over recent years in developed countries.^{7–9}

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 censuses 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 socioeconomic inequalities in census measures of health in England and Wales between 1991 and 2001.

METHODS

All data were downloaded from the National Statistics web site (<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 people living in households only while in 2001 all people were included. Data were 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 people 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 relation 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 relation 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 were 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 1). Figure 1 shows mean standardised permanent sickness and LLTI rates by TDS quintiles in 1991 and 2001 for men and women (data in the figure are not logged to ease interpretation).

Table 1 and figure 1 suggest that socioeconomic inequalities in standardised permanent sickness rates increased over time in men. While rates in four quintiles decreased, this decrease was most noticeable in the more affluent quintiles. In contrast, socioeconomic inequalities in standardised permanent sickness rates decreased over time in women due to increases in permanent sickness rates in all quintiles most pronounced 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 pronounced decreases in the most deprived quintiles.

Abbreviations: TDS, Townsend deprivation score; LLTI, limiting long term illness; SEIH socioeconomic inequalities in health,

Table 1 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

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

DISCUSSION

Using UK census data, we have found strong evidence of socioeconomic inequalities in both standardised LLTI and permanent sickness rates among working age men and women in England and Wales at the ward level in both 1991 and 2001. In addition, there was evidence that socioeconomic inequalities in standardised LLTI rates decreased in both men and women between 1991 and 2001 along with those in permanent sickness in women, while socioeconomic inequalities in permanent sickness in men increased. Our data are 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.

What this paper adds

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

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 people 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 be 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,

Figure 1 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.

Policy implications

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

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 with 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. While 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 people to identify as many reasons for not working as applicable, including permanent sickness and retirement, early retirement because of ill health should not have unduly effected the results.

Our findings may seem somewhat contradictory with evidence of both increasing and decreasing SEIH—albeit small differences in both cases. Data supporting both findings have been previously published.⁷⁻⁹ Our results may suggest that socioeconomic inequalities in self reported morbidity among working age adults have decreased in England and Wales between 1991 and 2001, but that socioeconomic inequalities in labour market participation have increased in men but not women. This may be because of 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 wholesale change in SEIH over recent years with large sample sizes lending statistical significance to small absolute, and possibly unimportant, changes.

Authors' affiliations

J Adams, I Holland, M White, Public Health Research Group, School of Population and Health Sciences, University of Newcastle upon Tyne, Newcastle upon Tyne, UK

Funding: JA is supported by a Wellcome Trust Value in People award from Newcastle University.

Conflicts of interest: none declared.

Ethical approval was not required for this secondary analysis of anonymised, publicly available data.

Correspondence to: Dr J Adams, Public Health Research Group, School of Population and Health Sciences, University of Newcastle upon Tyne, Newcastle upon Tyne NE2 4HH UK, Jean Adams; j.m.adams@ncl.ac.uk

Accepted for publication 1 October 2005

APPENDIX

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

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

REFERENCES

- 1 Townsend P, Davidson N, eds. *Inequalities in health: the Black Report*. London: Penguin Books, 1982.
- 2 Townsend P, Phillimore P, Beattie A. *Health and deprivation: inequality and the North*. Bristol: Croom Helm, 1988.
- 3 Whitehead M. *Inequalities in health: the health divide*. 3rd ed. London: Penguin Books, 1992.
- 4 Mackenbach J, Kunst A, Cavelaars E, et al. Socioeconomic inequalities in morbidity and mortality in western Europe. *Lancet* 1997;**349**:1655-9.
- 5 Kunst A, del Rios M, Groenhof F, et al. Socioeconomic inequalities in stroke mortality among middle-aged men: an international overview. *Stroke* 1998;**29**:2285-91.
- 6 Kunst A, Mackenbach J. The size of mortality differences associated with educational level in nine industrialized countries. *Am J Public Health* 1994;**84**:932-7.
- 7 Crimmins E, Saito Y. Trends in healthy life expectancy in the United States, 1970-1990: gender, racial, and educational differences. *Soc Sci Med* 2001;**52**:1629-41.
- 8 Dalstra J, Kunst A, Geurts J, et al. Trends in socioeconomic health inequalities in the Netherlands, 1981-1999. *J Epidemiol Community Health* 2002;**56**:927-34.
- 9 White C, van Galen F, Chow Y. Trends in social class differences in mortality by cause, 1986 to 2000. *Health Statistics Quarterly* 2003;**20**:25-37.
- 10 Scrivener G, Lloyd D. Two proxies for morbidity in the 1991 UK census: permanent sickness and limiting long term illness. *J Epidemiol Community Health* 1996;**50**:223.
- 11 Haynes R, Bentham G, Lovett A, et al. Effect of labour market conditions on reporting of limiting long term illness and permanent sickness in England and Wales. *J Epidemiol Community Health* 1997;**51**:283-8.
- 12 Faggio G, Nickell S. *Inactivity among prime age men in the UK*. London: Centre for Economic Performance, London School of Economics and Political Science, 2005.
- 13 Beatty C, Fothergill S. The diversion from 'unemployment' to 'sickness' across British regions and districts. *Regional Studies* 2005;**39**:837-54.
- 14 Belt V, Richardson R, Webster J. Women's work in the information economy: the case of telephone call centres. *Information, Communication and Society* 2000;**3**:366-85.