

## Chapter 8: Socio-Economic Status and Adult Mortality in England: a Historical Study, 1881-1891.<sup>1</sup>

### Introduction

Currently, and throughout the twentieth century, there is clear evidence of a social gradient in adult mortality, in England and elsewhere.<sup>2</sup> The Registrar-General of England and Wales published figures for adult mortality ratios for men by occupationally defined social class for the period 1910-1953, which showed a social class gradient amongst men in 1910-12, with particularly large differences between Social Classes I and V. This persisted throughout the first half of the twentieth century, although it had diminished somewhat by 1949-53.<sup>3</sup> Inequalities widened again after 1970, and appear to have worsened even further in the 1990s, contributing to the current major concern over the health effects of social inequality.<sup>4</sup> Although there are various methodological debates about these trends, it seems clear from these reports of the Registrar General, and other sources, that a social gradient in mortality was a feature of twentieth century England.

Evidence for the nineteenth century is, however, less clear. Many contemporary commentators linked poverty with poor health and higher mortality amongst adults. However, much of the data for this conclusion was based on death registers which did not take account of the population at risk, a flaw first pointed out by Farr in his discussion of life tables.<sup>5</sup> This critique is particularly relevant to the work of Chadwick, who used information from death registers on occupation and age at death to estimate mortality ratios, without allowing for the population at risk.<sup>6</sup>

Chadwick's work influenced a number of influential contemporary thinkers, including Engels and Mayhew.<sup>7</sup> Early reports from the Registrar-General which indicate occupational and social class differences in adult mortality during the nineteenth century,<sup>8</sup> also suffered from various difficulties. These include possible numerator-denominator bias as the population at risk is calculated from census information and the number of deaths from civil registration returns (a weakness also of twentieth century estimates), which use different methods of classification of data. Descriptions of occupations are also often ambiguous and difficult to classify, with heterogeneous variations within occupational categories, often locally based. Additionally, analyses of national data does not allow for the role of geographical place, which often had a significant influence on mortality.<sup>9</sup>

For example, clergymen and agricultural labourers both had low adult mortality rates in the late nineteenth and early twentieth century,<sup>10</sup> probably due to their residence in rural areas. Available data also does not cover all occupations, so that labourers – who were

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<sup>1</sup> Unpublished paper, written jointly with Emily Grundy.

<sup>2</sup> G. Davey Smith, D. Dorling, M. Shaw, *Poverty, Inequality and Health in Britain*, 2001; General Register Office, *Fifth Registrar-General's Annual Report, 1841*, pp. xxviii-xxxii; R.G. Wilkinson, K. Pickett, *The Spirit Level: Why Equality is Better for Everyone*, 2010; E. Chadwick, *Report on the Sanitary Condition of the Labouring Population of Great Britain*, 1865.

<sup>3</sup> J. Parker, C. Rollett, K. Jones in A.H. Halsey (ed.) *Trends in British Society since 1900*, 1971.

<sup>4</sup> Davey-Smith, *Poverty*; Wilkinson, *The Spirit Level*.

<sup>5</sup> General Register Office, *Fifth Registrar-General's Annual Report, 1841*, pp. xxviii-xxxii

<sup>6</sup> Chadwick, *Report*.

<sup>7</sup> P. Razzell, *Population and Disease: Transforming English Society, 1550-1850*, 2007.

<sup>8</sup> R. Woods, *The Demography of Victorian England and Wales*, 2000.

<sup>9</sup> E. Garrett, A. Reid, K. Schurer, S. Szreter, *Changing Family Size in England and Wales: Place, Class and Demography, 1891-1911*, 2001.

<sup>10</sup> Woods, *The Demography; Supplement to the Registrar-General's Seventy-Fifth Annual report, Part IV: Mortality of Men in Certain Occupations in the Three Years 1910, 1911 and 1912*.

one of the most numerous and poorest occupational groups – are excluded from some analyses.<sup>7</sup>

Farr's own investigation of mortality rates in London indicated no significant difference in mortality between wealthy and poor areas of London in 1838-44.<sup>11</sup> Neison also concluded from Insurance Company and Friendly Society records that there was no link between poverty and adult mortality.<sup>12</sup> However, the latter is subject to the problem of selection as results are based on those who chose, and could afford, to join and remain in Friendly Societies.

One way of partly dealing with these problems is to trace individuals directly through census, civil death register and other source material so avoiding numerator-denominator bias. Additionally, census data provide information on indicators of socio-economic status other than occupation and allow geographical factors to be taken into account. The potential of linked census and registration data has been explored to some extent in two previous small scale studies. In a study of forty-seven Bedfordshire parishes in the 1840s, tracking married couples between the 1841 and 1851 Censuses, results indicated that there was slightly higher mortality amongst professionals, merchants and gentleman than amongst labourers.<sup>13</sup> A similar methodology was employed in research on Ipswich in the 1870s, which suggested that adult mortality was higher in Social Classes I and II than in IV and V, although by the 1890s the position had been slightly reversed.<sup>14</sup>

In the study reported here we have extended this method and applied it to a national sample of married people enumerated in the 1881 Census. The methodological aim of the paper was to investigate tracing rates between census and other sources, principally registration of deaths, and the extent to which using census derived information on transitions from being married to being widowed can be used to extend identification of deaths. The substantive aim was to investigate the extent of social inequalities in adult mortality in late nineteenth century England.

## Methods: Data.

We compared the mortality of two contrasting groups: 'elite' couples, defined as those with two or more domestic servants, and poor couples defined on the basis of husband's occupation as a labourer. The link between family income and the number of domestic servants has been widely documented for the period 1825-1906.<sup>15</sup> In general terms, the wealthier the family the greater the number and types of servant they employed, although this association is not perfectly linear.<sup>16</sup> The occupations of head of households in two-servant+ families identified in the current research are heavily concentrated in professional, business and landed families, although also including a number of farmers. Eight married couples were chosen from each county of England, four from each rural parish and four from each county town. We selected the first couple in the 1881 Census enumeration list with two or more domestic servants – designated as elite couples – and then the next family

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<sup>11</sup> Razzell, *Population*, p. 136.

<sup>12</sup> *Ibid*, p. 220-23.

<sup>13</sup> *Ibid*, p. 201-02.

<sup>14</sup> *Ibid*, p. 204.

<sup>15</sup> B.S. Rowntree, *Poverty: a Study of Town Life*, 1901; J.A. Banks *Prosperity and Parenthood: a Study of Family Planning among the Victorian Middle Classes*, 1954; J. Burnett, *Plenty and Want*, 1968; P. Horn *The Rise and Fall of the Victorian Servant*, 1974; L. Schwartz, 'English servants and their employers during the eighteenth and nineteenth centuries', *Economic History Review*, 1999 Volume 52.

<sup>16</sup> E. Higgs, 'Domestic servants and households in Victorian England', *Social History*, Volume 8, 1983.

headed by a labourer, known to be one of the poorest occupational groups in England at the end of the nineteenth century.<sup>17</sup> This method of selection was repeated four times for each parish in the sample resulting in 156 elite and 156 labourer couples – and was adopted in order to compare well-defined groups with significantly different socio-economic profiles but the same geographic location.

Sample members were then traced in the 1891 Census, as well as in the civil register index of deaths. The methodology used involved triangulation between census, civil register, and probate sources. Tracing in the census was undertaken to identify those still alive (present in the census) and those whose death could be inferred by the fact that their spouse was present in 1891 but identified as widowed. Two family history sites were employed for this purpose. A first search was made using *Find My Past* and a second using *Ancestry*. It was necessary to use two sites because of the variable accuracy of the transcripts on which the family history indexes are based; variations in the spelling and presentation of birth places; inaccuracies in age reporting. Eighty-nine per cent of cases were traced through the *Find My Past* website, and a further eleven per cent in *Ancestry*.

In summary the following steps were carried out:

1. A search was made for the 1881 sample in the *Find My Past* 1891 census online index.
2. For unidentified cases, a further tracing exercise was carried out on the *Ancestry* 1891 census index.
3. A search was then carried out in the civil registration death index.

The civil registration death index contains information on the name of the individual, his or her age, the registration district in which the death was registered, and the quarter/ year of death. There is no information on kinship connections, occupation or other details which would facilitate identification and allow classification by socio-economic status.

Probate calendars usually provide information on place of death, address, exact date of death and kinship relationships but are only available for a proportion of the population with wealth to bequeath. These calendars have been digitized and indexed by the *Ancestry* family history site for the period 1861-1941, and this data was used to check assumptions about the identification of deaths. In order to trace husband and wives between censuses the following key information is available in the censuses: 1. Name. 2. Age. 3. Birthplace. 4. Registration District. 5. Occupation. 6. Name, birthplace and age of children. Some of this information is also available in the death indexes – name, age and registration district of death.

There are a number of problems in linking census data for individuals, including the variable accuracy of the transcripts on which the family history indexes are based and the remarriage after widowhood especially for women changing their surname on remarriage. In cross-matching census data, a correct identification was assumed to take place when name, birthplace and age to within plus or minus five years were found to be the same. Other identifying information – such as spouse's and children's names, ages and birthplaces, plus occupational information – was also used where necessary. The research employed manual matching which inevitably employs an element of judgment, although the range of identifying information available is sufficiently great to minimize the impact of observer variation (and would suggest potential for computerised matching).

The major problem in the research however is the relative paucity of identifying information in the death indexes. If a person dies outside the registration district in which they were enumerated, it is very difficult to establish a reliable match from census to death index. It was therefore necessary to make recording of death in a previously identified enumeration district of residence a criteria for judging a link between a census and a death

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<sup>17</sup> Rowntree, *Poverty*; Burnett, *Plenty*.

record (this was not a criteria in the census matching because of the wider range of information available in the census). Other matching criteria used were name and age.

## Results

*Table 1: Information on Tracing of Sample Couples in the 1891 Census.*

Tracing in 1891 Census	Elite Couples	Labourer Couples	All Couples
Husband & Wife Both Traced	64.1%	65.4%	64.7%
Husband Traced As A Widower	8.3%	6.4%	8.0%
Wife Traced As A Widow	13.5%	8.3%	10.9%
Neither Traced	14.1%	16.0%	15.1%
Total Number Of Couples	156	156	312

Overall, it was possible to trace 84.9 per cent of all 1881 sample couples in the 1891 census through identification of one or both spouses. The remainder will include couples both of whom died or emigrated and transcription errors and variations in the presentation of matching information. Of 233 elite husbands and wives traced alive in the 1891 Census, 71 – 30.5 per cent – were located in a different registration district, whereas the equivalent figure for labourers’ husbands and wives was 43 out of 237 – 18.1 per cent.

## Identifying Deaths

Three methods were used to ascertain death of one or both members of a couple:

1. Widows and widowers were identified in the 1891 Census.
2. A search was made of the BMD civil register index of deaths.
3. An attempt was made to trace all identified deaths in the *Ancestry* probate calendar index.

As previously noted, the most difficult part of the research is the quality of the death register index and the limited information in it. Criteria for deciding on a match therefore included registration in the known census district of enumeration in 1881 and/or known enumeration district (of sample member of their surviving spouse) in 1891. In order to examine this assumption, an analysis was made of death entries for the spouses of husbands and wives who were listed as widowers and widows in the 1891 census. Of 61 such cases that occurred in the period 1881-1891, it was possible to trace 49 – 80.3 per cent – in the death register index. These findings illustrate the value of having two methods of measuring the incidence of deaths. Up to 20 per cent of deaths were not located in the death register index, but the data on widowers and widows allows us to correct for this deficiency. The latter information indicates that a death took place within a particular decade, whereas for about 80 per cent of cases it is possible to identify the exact quarter and year of death.

The above figures on the identification of deaths assume that a death that occurs within an appropriate enumerated registration district is correctly identified. In order to test this assumption a search was made in the *Ancestry* probate calendar index for all identified

deaths cases, both those of spouses of surviving widows and widowers and those identified independently.

*Table 2: Deaths Identified in the Civil Register Index Traced in the Probate Calendar Index, 1881-1891.*

	Total Deaths Listed In Civil Register Index	Number Traced In Probate Calendar	Proportion Traced
Elite Males	24	21	87.5%
Elite Females	13	2	15.4%
Male Labourers	22	2	9.1%
Labourers' Wives	15	1	6.7%
Total	74	27	36.5%

As perhaps expected, it was possible to identify a much higher proportion of elite males in the probate calendar than other groups. In every case, the information in the calendar indicated that death register index entries were correct, in most cases listing the names of widows and widowers, along with details of address and other identifying information. The calendar entries include data on the amount of personal estate, which will be of value in classifying socio-economic status in future work.

*Table 3: Adult Mortality among Couples in Elite and Labourers' Families, 1881-1891.*

	Elite Husbands	Labourer Husbands	Elite Wives	Labourer Wives	Total
Number In 1881	156	156	156	156	624
Number Traced 1881-91	146	142	136	140	564
Number Alive In 1891 Census	115	117	121	121	474
Number Dead Through Census Tracking	23	16	14	15	20
Number Dead Through Civil Register	8	9	1	3	21
Proportion Dead Of Traced Cases	21.2%	17.5%	11.0%	12.9%	15.8%
Mean Age (Years) in 1881	48.0	43.0%	43.2	41.5	44.1

Table 3 summarizes the results discussed above, and shows the estimate of the proportion of each group who died 1881-1891 derived from these various sources. This suggests higher survival among women than men but little difference in the mortality of elite and labourer groups. However the distribution of the samples by age group varied slightly and the mean age of labourers (42.4) was slightly younger than that of the elite (45.6) (although the difference was not statistically significant). Results from a logistic regression model in which the outcome was dichotomised to alive/dead (and those untraced were excluded) and including age (single years), sex, elite/labourer status and rural or urban residence showed that odds of death did not vary significantly by elite/labourer status (or for labourers relative to elite: 1.06, 95% confidence interval 0.66-1.73). (Table 4)

*Table 4: Logistic Regression of Adult Mortality among Couples in Elite and Labourers' Families, 1881-1891.*<sup>18</sup>

	Odds Ratio	95% CI	P
Labourer (Ref. Elite)	1.068	0.658-1.732	NS
Women (Ref. Men)	0.679	0.416-1.108	NS
Age	1.062	1.043-1.081	<0.00

Table 4 shows, that as would be expected older age was associated with an increased risk of death by 1891, but that there was no significant difference between labourers and the elite.

## Discussion

There is a well-established association between social class and adult mortality in England from the early twentieth century onwards. However, this association may not have been evident in earlier periods raising questions about the pathways between social inequality and adult mortality in differing historical contexts.

For the present research, a national sample of 312 married couples was selected from the 1881 English Census comprising four elite and four labourer couples drawn from one urban and one rural parish in each county of England. Mortality 1881-1891 was ascertained through linkage to the 1891 Census and the civil register death index. About ninety per cent families were traced in the census or the death index. Results showed no significant differences between mortality of elite and labourer couples for either husbands or wives

These results illustrate firstly the potential for linking several data sources to provide more information about variations in mortality in the late nineteenth century. Triangulation was used in which transitions from being married to widowed were used to help identify deaths of spouses. However this method does have limitations. Firstly in both contemporary and historical populations it is known that the married have better health and lower mortality than the non married, so the sample is selected to some extent. Secondly, loss to follow up may be associated with death of both spouses. For these reasons and the way the sample was selected, it is not truly random, although the design meant that those included were matched geographically and so avoids problems of the distorting effects of place.

The extent, origin, and evolution of inequalities in health in England and elsewhere is a major topic of current debate in social policy and epidemiology, particularly as such inequalities appear to have widened in the last quarter of the twentieth century.<sup>19</sup> As noted by Wilkinson and Pickett, although social inequality was greater in earlier historical periods, there are some indications that these inequalities were not reflected in health differentials to the same extent as in contemporary populations.<sup>20</sup> Studies which have compared the aristocracy and the total population, for example, suggest that there were minimal associations between socio-economic status and adult mortality prior to and into the nineteenth century.<sup>21</sup> Preston and Haines also concluded from their analysis of child mortality in late nineteenth century America that differentials by level of income were not important.<sup>22</sup> More

<sup>18</sup> Number = 590, excluding those not traced.

<sup>19</sup> Davey-Smith, *Poverty*; Wilkinson et.al., *The Spirit Level*.; J. Spijker, L. Van Wissen, 'Socioeconomic determinants of male mortality in Europe: the absolute and relative income hypothesis revisited', *Genus*, Volume 66, 2010.

<sup>20</sup> Wilkinson et.al., *The Spirit Level*.

<sup>21</sup> A. Day Bailey Hutchinson, 'On the rate of mortality prevailing amongst families of the peerage during the nineteenth century', *Journal of the Statistical Society*, Volume 24, 1863.

<sup>22</sup> S.H. Preston, M.R. Haines, *Fatal Years: Child Mortality in Late Nineteenth century America*, 1991.

generally, Preston has argued that before the modern scientific understanding of how life style and personal health behaviour influence disease risks, the disease environment was more important than socio-economic status in shaping changing mortality patterns.<sup>23</sup>

Indeed greater material resources may have had some negative effects in enabling lifestyles including excessive consumption of high fat foods and alcohol and limited physical exercise.<sup>24</sup> There is evidence to suggest that the rural poor were forced to grow their own food, were unable to consume large amounts of alcohol because of their poverty, and were required to engage in intense physical activity as a result of their working conditions. By contrast, the wealthy are known to have consumed large amounts of rich food, alcohol and tobacco, and engaged in only in minimal amounts of physical activity because of the presence of household servants.<sup>25</sup> Thus in the nineteenth century for certain conditions, such as heart disease, there is some evidence of a reverse gradient (with richer people having poorer health).<sup>26</sup> Research in Sweden, Denmark, Holland and Switzerland has supported these conclusions, suggesting that the association between socio-economic status and all-cause adult mortality only emerged at the end of the nineteenth century, and that before the twentieth century ‘overall, a causal link between income and mortality is put into question.’<sup>27</sup>

Our results provide some limited evidence to suggest that there were no major socio-economic differences in all-cause adult mortality at the end of the nineteenth century. The above conclusions are however provisional, as there is no large-scale national data at the individual family level on socio-economic status and adult mortality to reliably establish the link between socio-economic status and adult mortality. The present paper can be viewed as a first step in creating such national data and further clarifying the historical relationship between social inequality and adult mortality

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<sup>23</sup> S.H. Preston, ‘The changing relationship between mortality and level of economic development’ *Population Studies*, Volume 29, 1975.

<sup>24</sup> M. Livi-Bacci, *Population and Nutrition: an Essay on European History*, 1991; P. Razzell, C. Spence, ‘The hazards of wealth: adult mortality in pre-twentieth century Britain’, *Social History of Medicine*, Volume 19, 2006.

<sup>25</sup> Razzell and Spence, ‘The hazards’.

<sup>26</sup> M. Marmot, R.G. Wilkinson, *Social Determinants of Health*, 1999.

<sup>27</sup> T. Bentsson, F. Van Poppel, ‘Socioeconomic inequalities in death from past to present: An introduction’ *Explorations in Economic History*, Volume 48, 2011.