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7 A Century of Poverty in England and Wales, 1898-1998: A Geographical Analysis

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This paper analyses geographical trends in relative poverty and inequality in England and Wales between 1898 and the present by assembling statistics for infant mortality, overcrowded housing and unemployment for Rowntree's times (1898 or 1901), the inter-war depression (1928 or 1931), the 'never-had-it-so-good' post-War boom (1951, 1958 or 1961) and the present (in practice, 1990 or 1991). Geographically, all variables display a relatively stable north-south divide and, in general, worse conditions in the great conurbations. Both infant mortality and overcrowding show clear long-run upwards trends in inequality, just as absolute levels fell; the history of unemployment is more complex. While the detailed findings may reflect the limitations of the current methodology, these overall conclusions appear robust.

Introduction

The paper is concerned with long-run trends in poverty in England and Wales between the publication of Rowntree's (1902) report on poverty in York and the present, and seeks in particular to provide a tentative quantitative answer to the question of whether relative poverty, measured geographically, has become more or less extreme. Such a study is only possible through the application of novel methods for data analysis based around a Geographical Information System (GIS), which is used to make data for different dates as closely comparable as possible. Even then the range of variables available for use is inevitably limited. Work on the underlying GIS is very much still in progress and there will eventually be considerable scope for refining the

methodology and, hopefully, employing a finer spatial resolution. Even so, it is believed that both the methodology and the results are sufficiently interesting to justify this paper.

Three indicators of poverty, chosen to be consistently available for the whole of England and Wales over the past 100 years, were interpolated onto a standardised spatial framework to allow direct comparison, both over time and one with another. This raises three issues that are addressed in this introduction: the geographical scale of the analysis, the choice of poverty indicators, and the periodisation employed.

The research of Rowntree and his contemporaries was strictly local in focus, studying poverty in a single town such as York (Rowntree, 1902) or a single district of the metropolis (Booth, 1889). Such a focus permitted them and later researchers following up their work (see for example McKendrick, 1998 or Shepherd, 1998) to combine qualitative and quantitative methods, but meant that they seldom developed a very clear grasp of the overall geography of poverty: much research concentrated on the East End of London simply because many researchers were London-based, and similarly Rowntree studied York for mainly personal reasons. The analysis is strictly quantitative, but permits us not only to make some broad generalisations concerning trends in relative poverty but also to clearly define the geography of relative poverty in different periods. In other words, the study is concerned with establishing which geographical areas experienced the worst hardship, and then with how much worse off they were relative to the best-off areas. The limitations of early data mean that the areas used are relatively large, thus placing the analysis at the top of a multi-scale approach to the study of poverty (Shepherd, 1998) but complementing more localised studies.

The debate about how best to define poverty is as old as the study of poverty itself and many different methods have been put forward (Burrows and Rhodes, 1998). As the study compares areas over the long-term against a background of wide social change it has used a relative rather than an absolute definition of poverty (Harris, 1998). Very few statistical indicators of poverty are available over the last century as a whole, and what follows is limited to three key indicators, each of which is discussed in more detail in the subsequent sections:

- **Infant mortality**: the death rate for children aged under 1, an essentially demographic variable and therefore one calculable for different periods with few problems of consistency. Infant mortality rates today are far

lower than in Rowntree's time, but the deaths of young children are still a deep trauma for the families concerned. The rate remains a useful indicator of broader poverty, being particularly influenced by the mother's health and nutrition, and the environment into which the child was born.

- **Overcrowded housing**: The data concern the number of persons in each household relative to the number of rooms, information gathered by every census this century. The definition of a household and the method of counting rooms are both problematic, and today greater emphasis might be given to other aspects of poor housing, such as available amenities and environmental issues including condensation. However, patterns prove remarkably enduring, and space and privacy are still greatly valued in society.

- **Unemployment**: An obvious measure of economic hardship, but the most problematic of the indicators used. Most available data derive from the operation of specific schemes for its relief, and are inevitably heavily influenced by their rules which have been constantly changed and adjusted. Instead the census is used as it is a relatively constant measure of under- and un-employment. Unfortunately the first census to provide this information was that of 1931.

Ideally, this paper would be concerned with continuous time series, but quite apart from the sheer volume of data that would be required much of the information used comes from the census, carried out only once every ten years; there was no 1941 census, and the collection of many other statistical series was interrupted by the two world wars. The census is particularly important for a complete coverage of the country at sub-county scale, sample surveys such as the Labour Force Survey include too few people from any one locality to provide reliable results. This study is therefore limited to comparing four key dates:

- **The turn of the century**: A period of prosperity relative to other nations, but also perceived as having great disparities between rich and poor. The focus of this paper is on 1898, but the 1901 census is often used.

- **The inter-war recession years**: A time which saw unemployment, especially in the north, first entering the political agenda but also the

foundations of modern consumer society being laid. The paper focuses on 1928, and the 1931 census.

- **The 'never had it so good' 1950s**: In 1957, Macmillan continued 'Go around the country, go to the industrial towns, go to the farms and you'll see a state of prosperity such as we have never had in my lifetime.' 1958 and 1961 are used.

- **The present - Booming Britain?**: The 1991 census is the main source, while not ideal this provides regular 30-year intervals. Infant mortality data come from the period 1990 to 1992.

The Historical GIS

The most recent data are available for very small geographical areas: wards, enumeration districts (EDs) or even, in the case of the mortality data, the precise postcode of the individual fatality's home (Dorling, 1997). However, for most of the century the data are limited to those that appeared in published reports: of the census, the Registrar General, and other organisations. The type of area used depends largely on date:

1. Until the First World War **Registration Districts** (RDs), of which there were around 630, were the principal publishing areas of the Registrar General and thus the census. They were originally defined in terms of towns and their spheres of influence (Lipman, 1949) giving some similarities to modern Travel-to-Work areas. Major provincial cities such as Norwich, Bristol, and Newcastle were generally RDs in their own right; the great cities of Liverpool, Manchester, and Birmingham each consisted of small clusters of RDs, and London contained over 30 RDs.

2. RDs were replaced by **Local Government Districts** (LGDs) which consisted of county and municipal boroughs and urban and rural districts. There were around 1,500 LGDs although as noted below this fluctuated considerably. When originally formed LGDs were typically subdivisions of RDs; the urban areas were designated as boroughs or urban districts while the rest of the RD became a rural district. This means that although LGDs provide a much more distinct rural/urban pattern than the RDs, their original pattern was nested within the RD structure.

3. Modern data are frequently published for **Wards** or **Enumeration Districts** (EDs). This gives vastly more spatial detail than the other two measures: in 1991 there were around 8,000 wards and 110,000 EDs in England alone (Coombes, 1995). Unit postcodes provide a similar spatial resolution.

Even comparing the same types of area at different dates is problematic as a constant trickle of boundary changes has taken place. LGDs provide an example: in 1901 there were 1,834 of them but by 1961 there were only 1,466, and even the areas which remained in existence throughout often experienced major alterations to their boundaries.

To cope with this the study was able to draw on a major project based at Queen Mary and Westfield College which is constructing a historical (GIS) which will contain a full record of the changing boundaries of the statistical reporting units of Britain from parish-level upwards (Gregory and Southall, 1998). Work to date has been limited to England and Wales, which is the only reason for the limited geographical focus of the study. When the system is complete, it will be possible to use the simple population counts which are available for the individual parishes to estimate the size and characteristics of the populations transferred by boundary changes (as in Dorling and Atkins, 1995), but for now the methods must assume that the population transferred is simply proportional to the area transferred (Goodchild and Lam, 1980).

The data sources and the areas used to map each data set are shown in Table 7.1. The need for standardisation is driven by two considerations: most obviously, it allows direct comparison between one date and another for each area. Perhaps even more importantly however, it allows the data to be compared consistently; the value given for any area is the average value within that area and therefore, as reporting units become geographically larger, local extremes are increasingly averaged away and the range of values is reduced. Data collected for the three different types of areas listed above are thus not comparable unless standardised onto a single type. As an example of this, using the raw LGD data for 1928, the infant mortality inequality ratio between the best ten per cent and worst ten per cent of the population is 6.3. However, standardising the data onto RDs reduces this to only 2.7, reflecting the removal of many of the urban/rural contrasts found among LGDs.

Table 7.1 Data sources and base maps used

Data set	Source	Collection areas	Mapped onto
Infant Mortality 1891-1900	The RG's Decennial Supplement, 1901	RD	RDs
Infant Mortality, 1928	The RG's Statistical Review, 1928	LGD	1928 LGDs for the North, 1910 LGDs for remainder
Infant Mortality, 1958	The RG's Statistical Review, 1958	LGD	Approximated 1951 LGDs
Infant Mortality, 1990-92	Individual Death Records	Postcodes	1981 wards
Overcrowding, 1901	1901 Census County Reports	LGD	1901 LGDs for the North, 1910 LGDs for remainder
Overcrowding, 1931 (both counts)	1931 Census County Reports	LGD	1931 LGDs for the North, 1910 LGDs for remainder
Overcrowding, 1961	The 1961 Census	LGD	Approximated 1951 LGDs
Overcrowding, 1991	1991 Census Small Area Statistics	EDs	1981 wards
Unemployment, 1931	1931 Census Employment Report	LGD	1931 LGDs for the North, 1910 LGDs for remainder
Unemployment, 1951	1951 Census Employment Report	LGD	Approximated 1951 LGDs
Unemployment, 1991	1991 Census Small Area Statistics	ED	1981 wards

Note: RG's stands for Registrar General's. 'North' in the 'Mapped onto' column refers to the four Northern counties of England plus Lancashire and Cheshire, and the East and North Ridings of Yorkshire.

Standardisation must be based on the least detailed set of areas for which data was collected. For this reason RDs as they existed in 1898 were used. The basic problem can be summarised as the need to redistribute a variable Y from a set of source zones S onto a set of target zones T. The estimated values of Y for each target area can then be calculated as:

$$\hat{y}_t = \sum_s \frac{A_{st} y_s}{A_s} \quad (1)$$

where A_s is the area of the source zone, A_t is the area of the target zone, A_{st} is the area of the zone of intersection and Y is the variable being modelled (Flowerdew & Green, 1994). The GIS allows this to be done in a very straightforward manner using an overlay operation where two 'maps' have a geometric union operation applied and new areas are calculated based on the results.

The modern data required a slightly different methodology based on using either a corrected ED centroid or unit postcode centroid to aggregate up to 1981 wards (Dorling, 1993). The resulting ward level data were then re-allocated to 1898 RDs based on the entire value being allocated to the RD which contained the largest part of the ward. Until the entire GIS is finished it is felt that this is acceptable given the large degree of aggregation at each stage, from over 100,000 EDs or unit postcodes to around 10,000 wards to 630 RDs.

For both methodologies it is believed that the effect of the interpolation is likely to reduce contrasts due to the smoothing effects that the homogeneous population assumption will cause.

Once the data were in this standardised form, the districts containing the worst-off ten per cent of the population, and the best-off ten per cent could be identified: the measure of relative poverty is simply the ratio of the average rate for the relevant indicator in the worst-off districts to the average for the best-off districts. Note that the worst-off districts will by no means contain all the individuals or households in the worst-off ten per cent of the population as a whole: many, and probably the majority of the people in these districts will not be that badly off, while some people in better-off districts will be among the ten per cent worst-off individuals. However, so long as the most detailed data available concerns geographical aggregates, not individuals, the focus is necessarily blurred and there are advantages to such an ecological approach in that it allows us to observe ecological processes such as de-industrialisation, migration to areas with a better climate or, more abstractly, Thatcherism.

Mapping is a tool that has a long history in research on poverty. Booth for example used mapping for both presentational purposes, and to a more limited extent, for interpretative analysis (Shepherd, 1998). The advent of GIS has freed cartography from many of its traditional constraints and it provides us with a range of visualisation techniques (Hearnshaw and Unwin, 1994). Most people are familiar with the choropleth map where geographical areas are shaded according to the intensity of a value or rate recorded across them. The problem with these is that they emphasise often sparsely populated rural areas

while cities can all but disappear therefore, in addition to a choropleth, the maps included all provide an area figure. These are derived from conventional maps by a process in which the area of each district is made proportional to its population, or some other measure of its significance, while trying as far as possible to keep adjacent units together (Dorling, 1994, 1996). The result may be unfamiliar, but the shape of the country is broadly retained. One key feature of the population-based figures is that when the units are divided into five bands or quintiles, indicated by different shades of grey, each quintile covers one-fifth of the total population, and therefore there will be an equal area of each shade in each map. Conversely, the conventional maps often contain quite small areas of the darkest shade because the worst-off were concentrated into major cities.

The remainder of the paper consists of discussions of the three indicators of poverty in turn, and a short conclusion. Maps of each indicator at each date are also included. Although the techniques used are complex, the results are simple and best presented graphically, so the commentary is quite limited.

Infant Mortality

In many ways the infant mortality data permit the most straightforward comparisons as definitions have changed little. To represent 1898 data from the Registrar General's *Decennial Supplement* for the 1890s were used. These give rates of death per 1,000 births for ten years from 1891 to 1900, collected at RD level. For 1928 and 1958 the data were taken from the Registrar General's *Statistical Reviews* for the individual year in question, again expressed as deaths per 1,000 births. These were collected for LGDs. The 1990s data are slightly different in that they are based on actual death records for the years 1990 to 1992 with the postcodes used to provide a spatial reference which permitted them to be grouped by 1898 RD. Three years were used because modern rates are so low that small numbers can become a major statistical problem. The rate is expressed as deaths per 1,000 babies, based on the 1991 census and corrected both for normal under-recording and by using the national count of birth certificates to allow for the extra under-reporting typical of census counts of babies. The reason number of babies rather than births is used in the 1990s is to remove the impact of people migrating in the year that their baby is born, thus skewing the rates. This has become important as migration around the time of birth has become more common in the 1990s and families are now much smaller.

The century saw a massive fall in infant mortality, the rate for the median RD falling from 121 per thousand in the 1890s to 3.73 per thousand in 1990. The geographical pattern in the 1890s is very clear: high rates in the industrial districts of South Wales, the West Midlands and the North. Figure 7.1 shows clearly that the worst districts were concentrated in Lancashire and the West Riding; Tyneside was relatively healthy, and in London the worst conditions were in a small number of central districts. Rural areas were almost uniformly much healthier. By 1928, Lancashire and the West Riding had experienced significant improvement and some rural districts had fallen back in the ranking, particularly in parts of Wales and East Anglia. It seems that conditions in urban areas were improved by large scale public health measures, while rural areas were beginning to be penalised for poorer medical care.

The maps for 1958 and for 1990 are more difficult to summarise except on a regional scale. The north-south, or rather core-and-periphery divide is particularly clear in 1958, with almost uniformly low relative rates in the south east, and still strongly present in 1990. If anything, the urban-rural divide is clearer in the most recent map. Turning to the measure of relative inequality, tabulated in the conclusion, this is not concerned at all with how far the worst-off areas are grouped together, only with how they compare with the best-off areas. In the 1890s, the worst-off areas had only twice as high a mortality rate as the best-off areas, but by the 1990s they had seven-and-a-half times the rate of death.

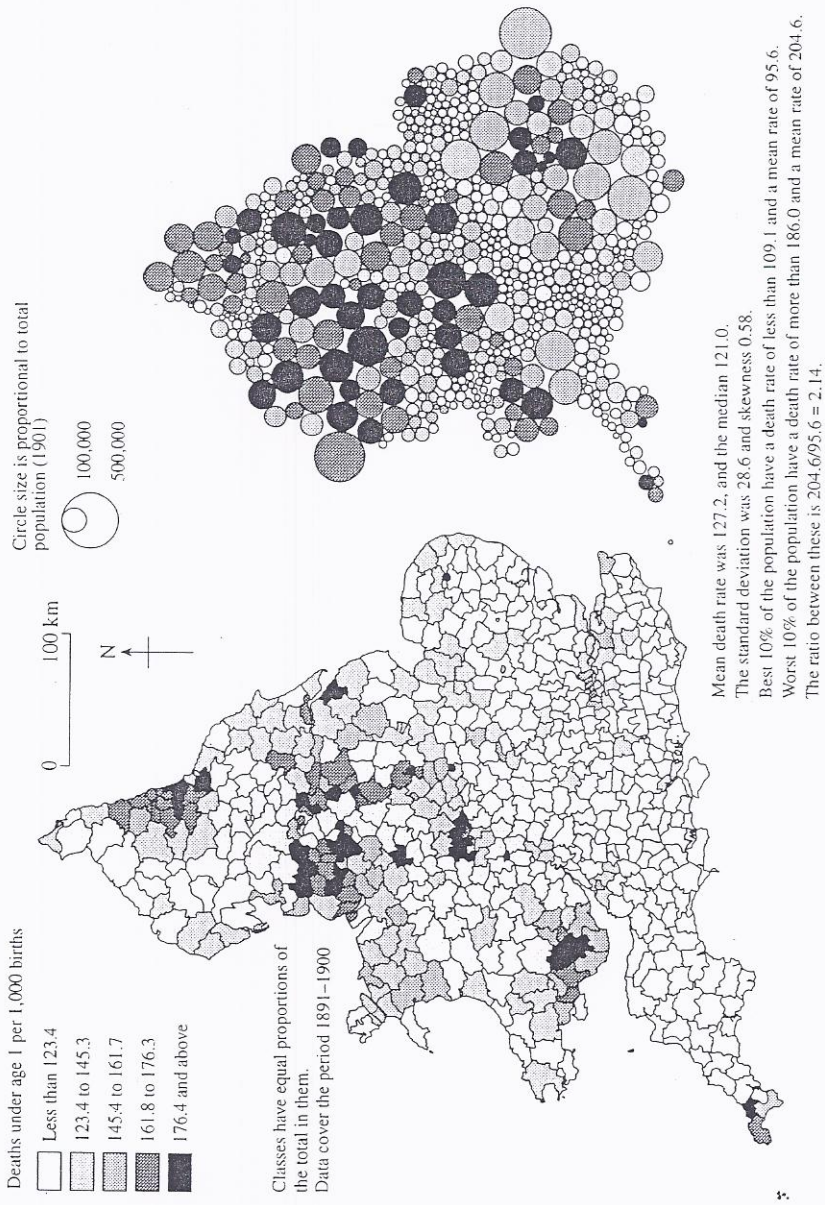

Figure 7.1 Infant mortality, 1898 on 1898 RDs

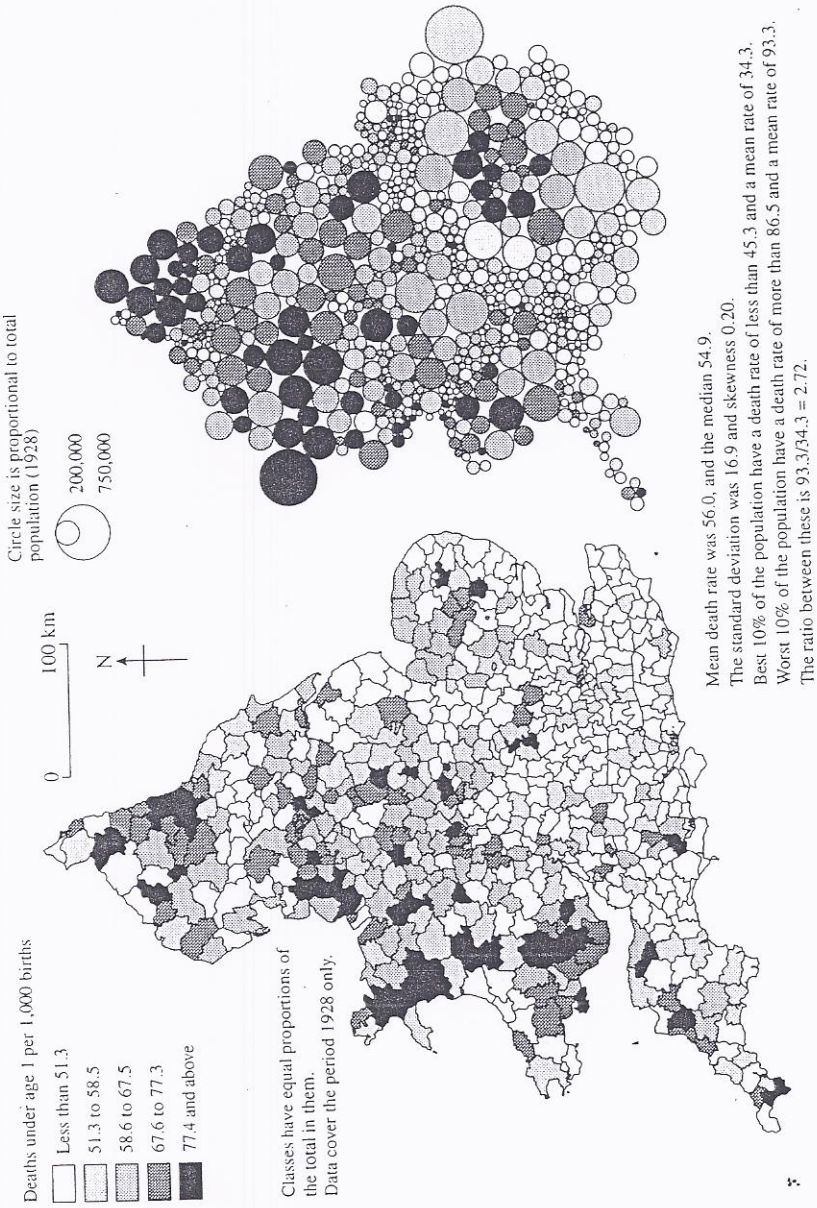

Figure 7.2 Infant mortality, 1928 on 1898 RDs

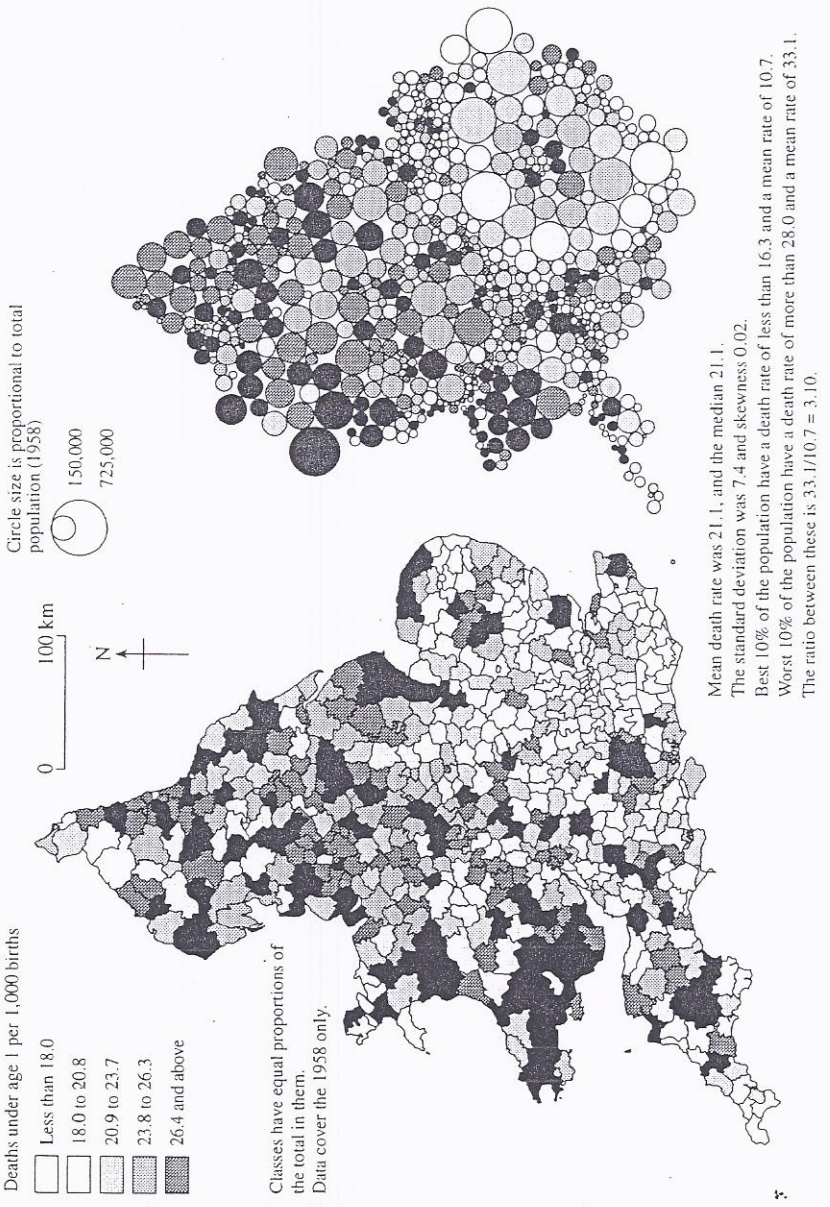

Figure 7.3 Infant mortality, 1958 on 1898 RDs

Figure 7.3 Infant mortality, 1958 on 1898 RDs

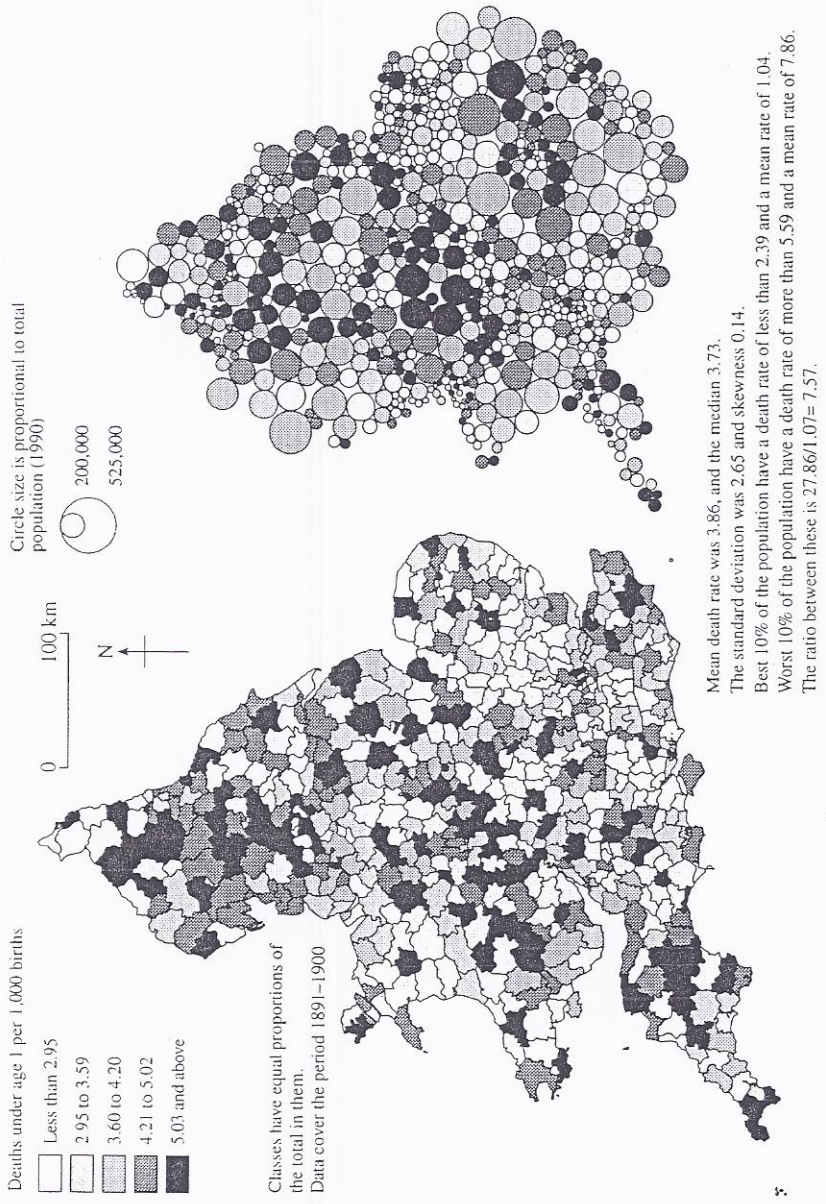

Figure 7.4 Infant mortality, 1990 on 1898 RDs

Overcrowded Housing

This section examines the changing geography of housing via census statistics of overcrowding. Overcrowding is usually summarised in terms of persons per room: in the nineteenth century, overcrowding meant rates of over two persons per room, but now over one person per room is seen as unacceptable. A compromise definition of over 1.5 persons per room has been used in this paper, the same standard as used by the 1931 census. For the three later dates the percentage of each district's population living at over 1.5 persons per room was calculated. For 1901 however the available data did not permit this calculation, the report tabulating numbers of persons only for 'tenements' of four rooms or less; the *General Report* of the 1901 census [Cd. 2174] describes (p.39) tenements as 'separate occupations', or in other words a dwelling with a separate front door. From this data the number of persons living at over 1.5 persons per room in these small dwellings could be calculated, and as no population figures were available this total had to be used to calculate a rate **per tenement**. The 1931 census allowed the calculation of a similar measure, based on taking the number of 'private families' living in four rooms or less and working out the density of occupation of these in terms of persons per room. This is slightly different to the 1901 definition because of the possibility of more than one family living in a single tenement: in 1931, where more than one family was enumerated within a 'structurally separate dwelling', each was classified in terms of the rooms the family occupied and not the total number of rooms in the dwelling. From this the number of families occupying less than five rooms could be calculated and this is given as a ratio of the number of families. There are therefore two sets of results included for 1931, the first permitting the closest possible comparison with 1901, the second with 1961 and 1991.

Overall, the most striking feature of the conventional maps is the concentration of the worst housing in both urban and rural districts in the north-east of England. This remains little changed from 1901 to 1961, but disappears completely by 1991. It has been suggested that these poor conditions were an extension of the very poor conditions that prevailed over the border in Scotland, and partly reflected the nature of the housing stock, with the distinctive and small 'Tyneside flat'; certainly, in 1901 a much higher proportion of all 'tenements' were of four rooms or less than in any other region. The transformation since 1961 may indicate the impact of specific policies. The figures show surprisingly low rates of overcrowding in the north-west and

Yorkshire, with the exception of Liverpool, while the West Midlands conurbation and London had large areas of overcrowding at their cores. With the exception of the north-east, these patterns changed relatively little over the period as a whole.

Turning to the inequality ratio, this again rises consistently, so that by 1991 the worst-off districts contained nearly 30 times the proportion of people living in overcrowded conditions as did the best-off areas - although of course that proportion was now far lower than in 1931: 5.78per cent versus 40.6 per cent.

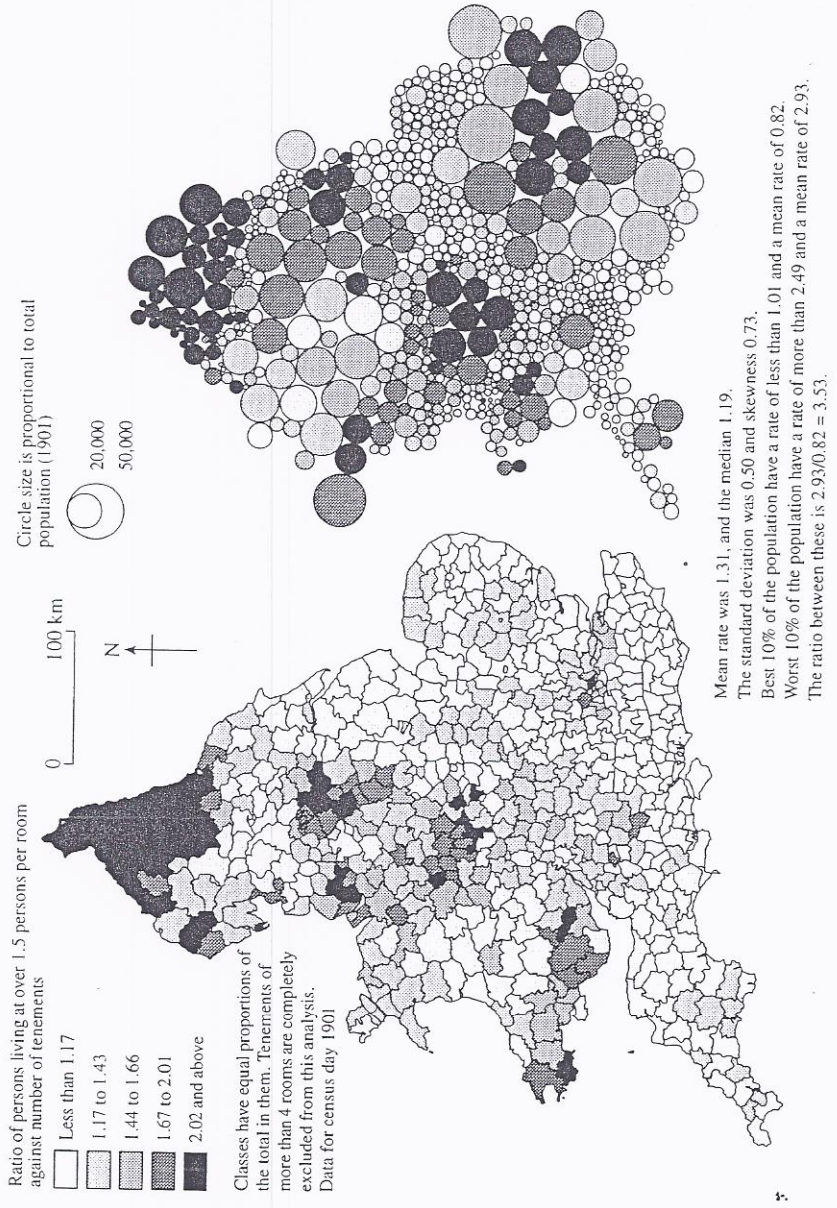

Figure 7.5 Overcrowding, 1901 on 1898 RDs (for tenements with less than five rooms)

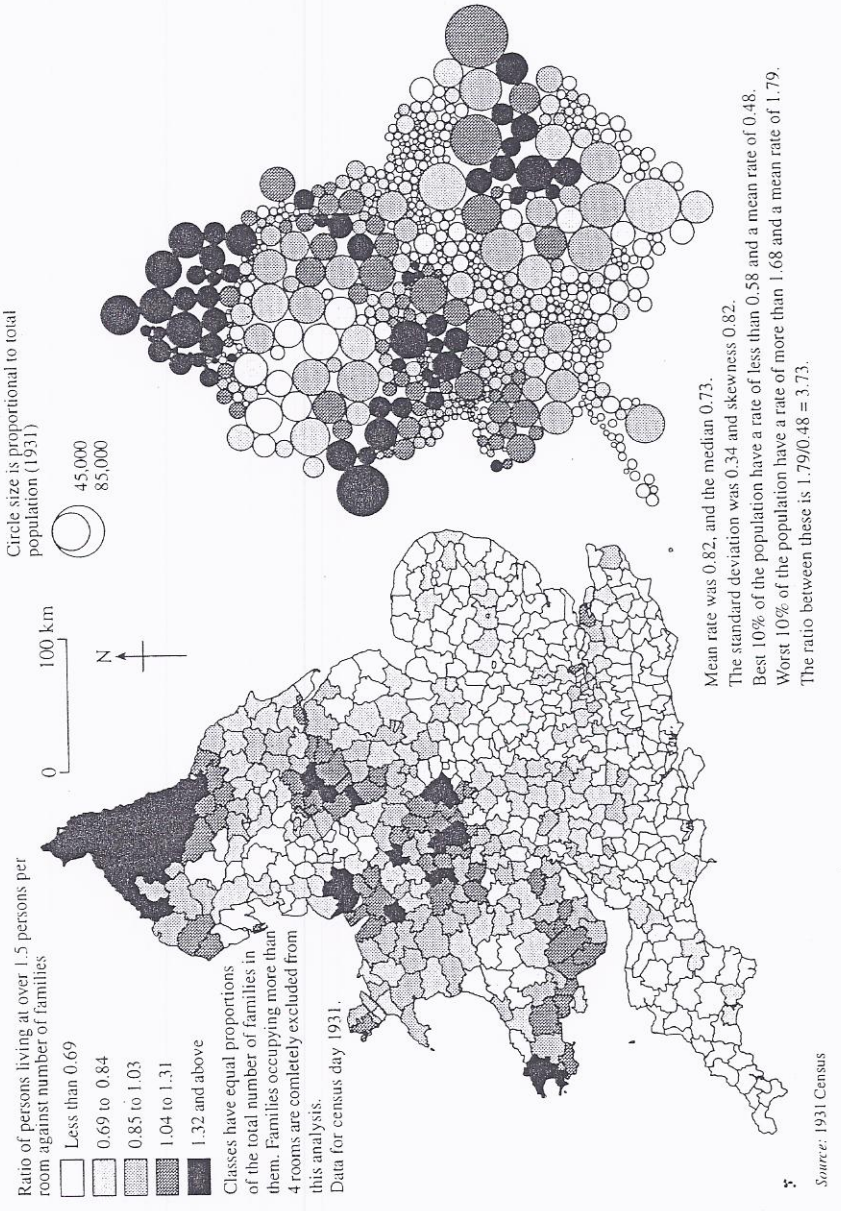

Figure 7.6 Overcrowding, 1931 on 1898 RDs

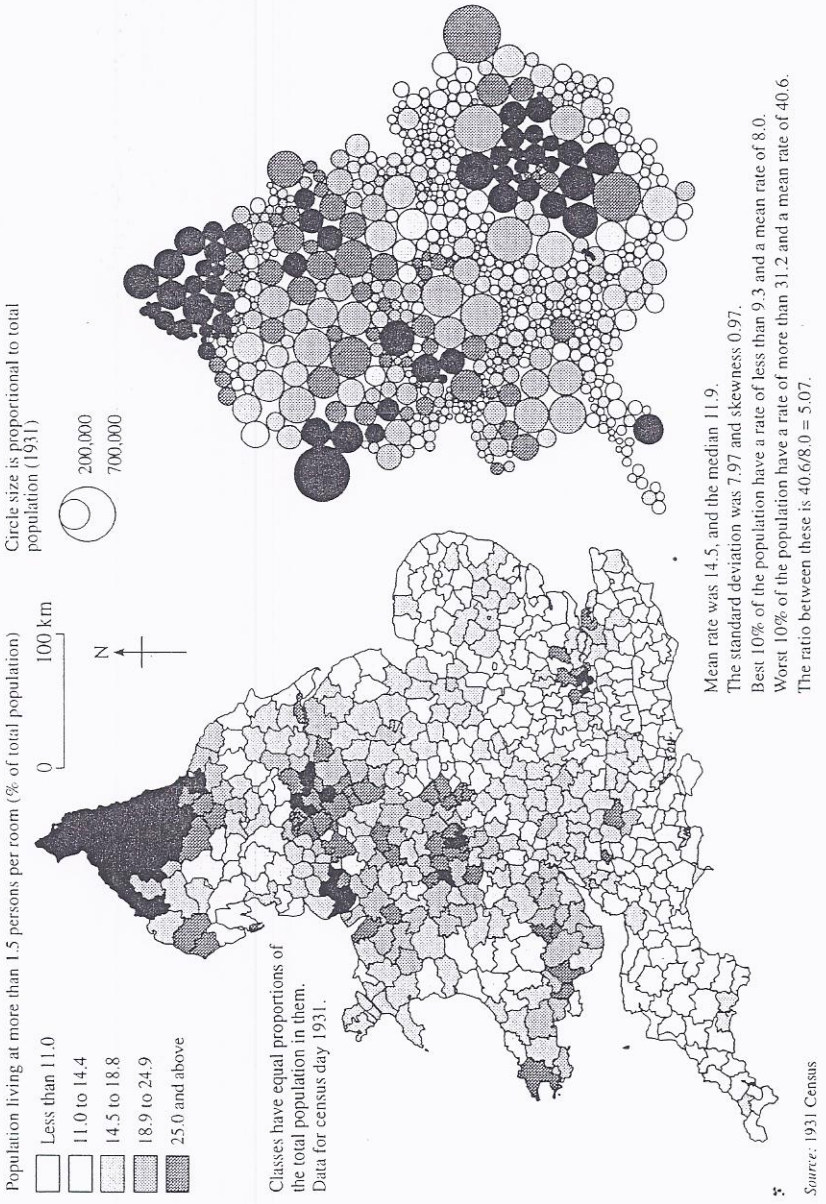

Figure 7.7 Overcrowding, 1931 on 1898 RDs (for families in less than five rooms)

Figure 7.8 Overcrowding, 1961 on 1898 RDs

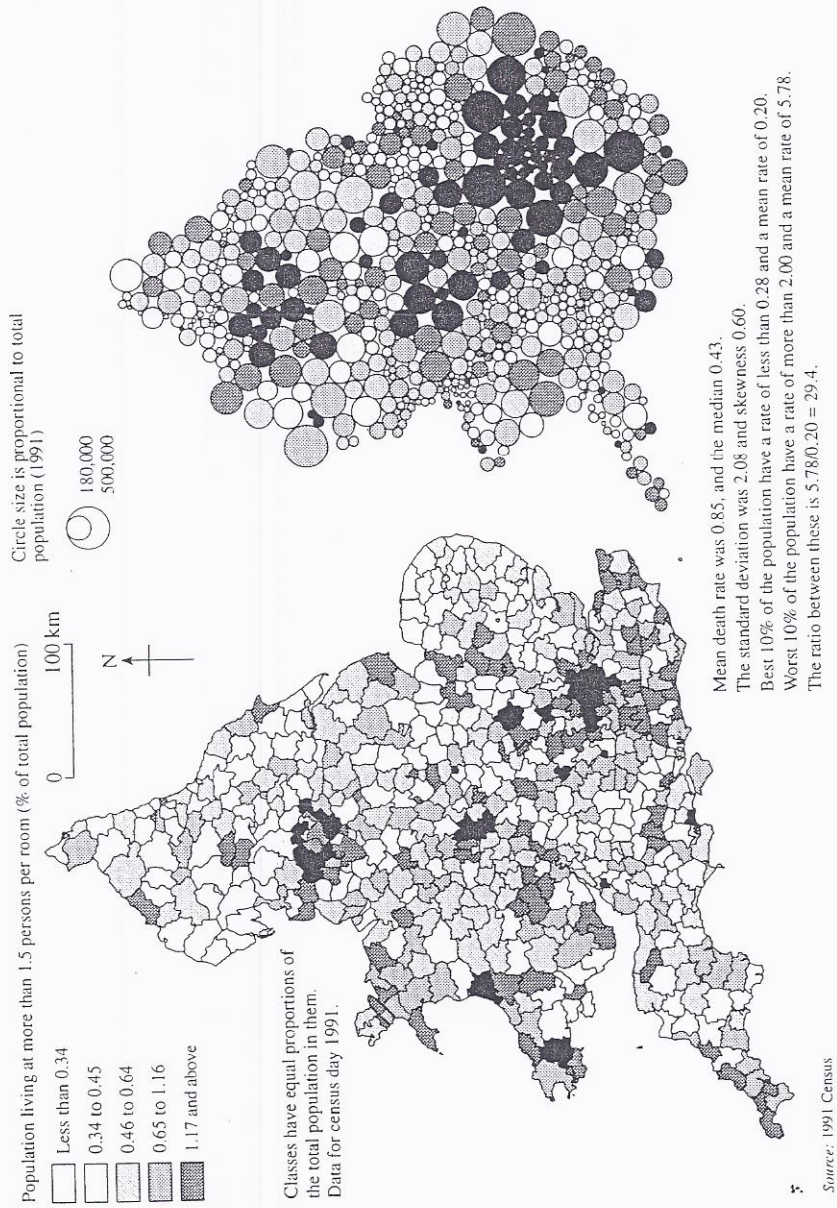

Figure 7.9 Overcrowding, 1991 on 1898 RDs

Unemployment is the most problematic of the indicators studied here - to avoid the problems of the ever-changing definitions used by government schemes the census measure is used for three of the four periods to provide some standardisation over time. Green (1995) compares the 1991 census definition of unemployment with other modern definitions, namely the National Insurance-based 'claimant count' (now based on the 'Jobseekers Allowance') and the Labour Force Survey and concludes that all three have their merits and are best used in combination. In a similar way data for the inter-war years are available from several sources including the Poor Law and Ministry of Labour's 'Local Unemployment Index' (LUI), as well as the 1931 census, and it is believed that the unemployment pattern shown by the census definition is broadly similar to that given by the other sources although further research to investigate this is intended. The study was unable to go back to the turn of the century as there were no straightforwardly comparable data available (Garside, 1980).

The 1991 data attempt to reflect recent debates by including not only those classified as unemployed by the census but also those people classed as being either unavailable for work due to permanent sickness or on a government training scheme; it is believed that many of these people would have been classified as unemployed in earlier censuses. Accordingly, the 1991 denominator used is the number of people who are economically active plus the long-term sick (excluding those over 65 for men and 60 for women). The results show unemployment as concentrated in the old industrial regions and, as the figure shows, London.

Census data in 1961 could not be used as the reporting areas were too crude, so 1951 data have been used to provide the snap-shot of the post-War boom. This provides data on those 'out of work' as the numerator and the economically active population, calculated as the total population aged between 15 and retirement age, as the denominator. By combining two tables this could be calculated for all LGDs but due to data limitations no account could be taken of the long-term sick. The most striking feature of the pattern is the very low rates - the maximum rate is only 8.1 per cent of the economically active population and the mean is under two per cent. This compares with means of 9.0 per cent and 11.2 per cent in 1931 and 1991 respectively. The spatial pattern, particularly on the figure is quite striking with higher rates concentrated in South Wales, the North East, London, and in coastal areas especially in the South. The reason for the coastal bias is probably that the census was taken in early April and classed seasonal workers in sea-side towns

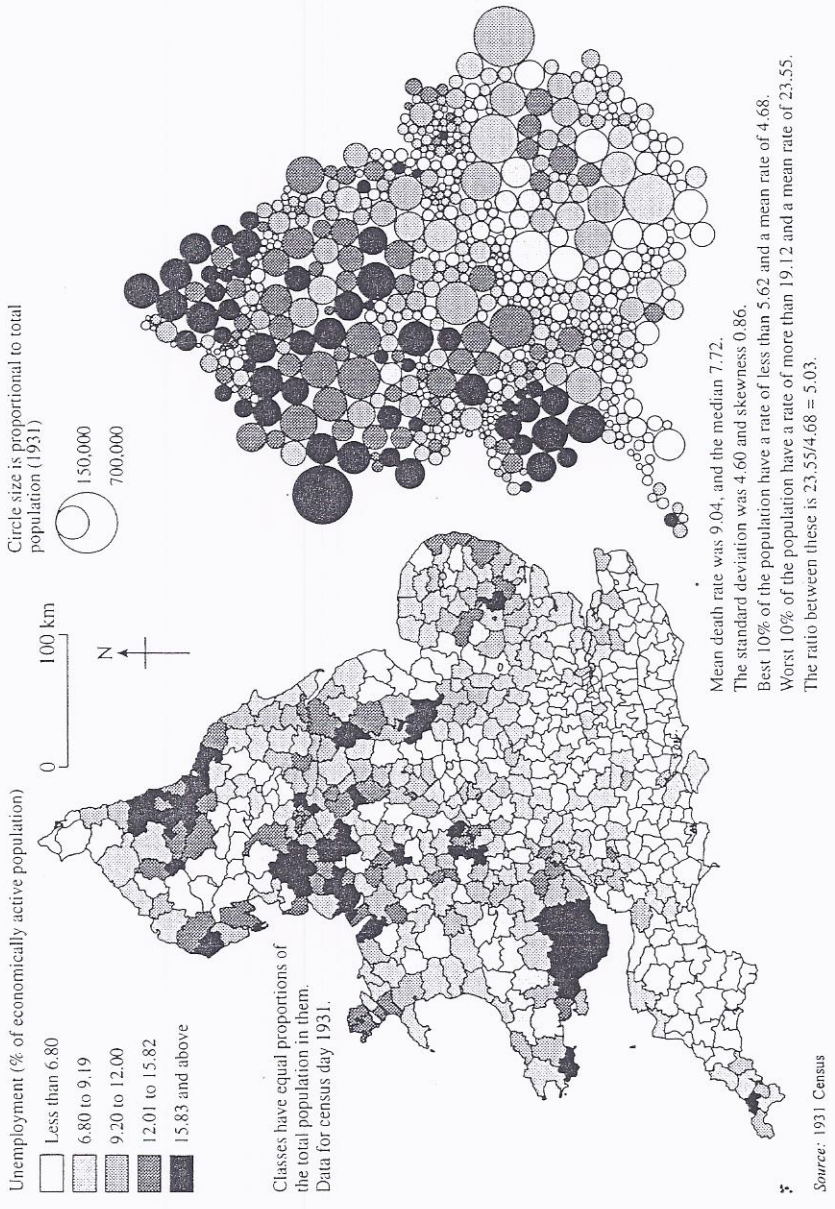

Figure 7.10 Unemployment, 1931 on 1898 RDs (census definition of unemployment)

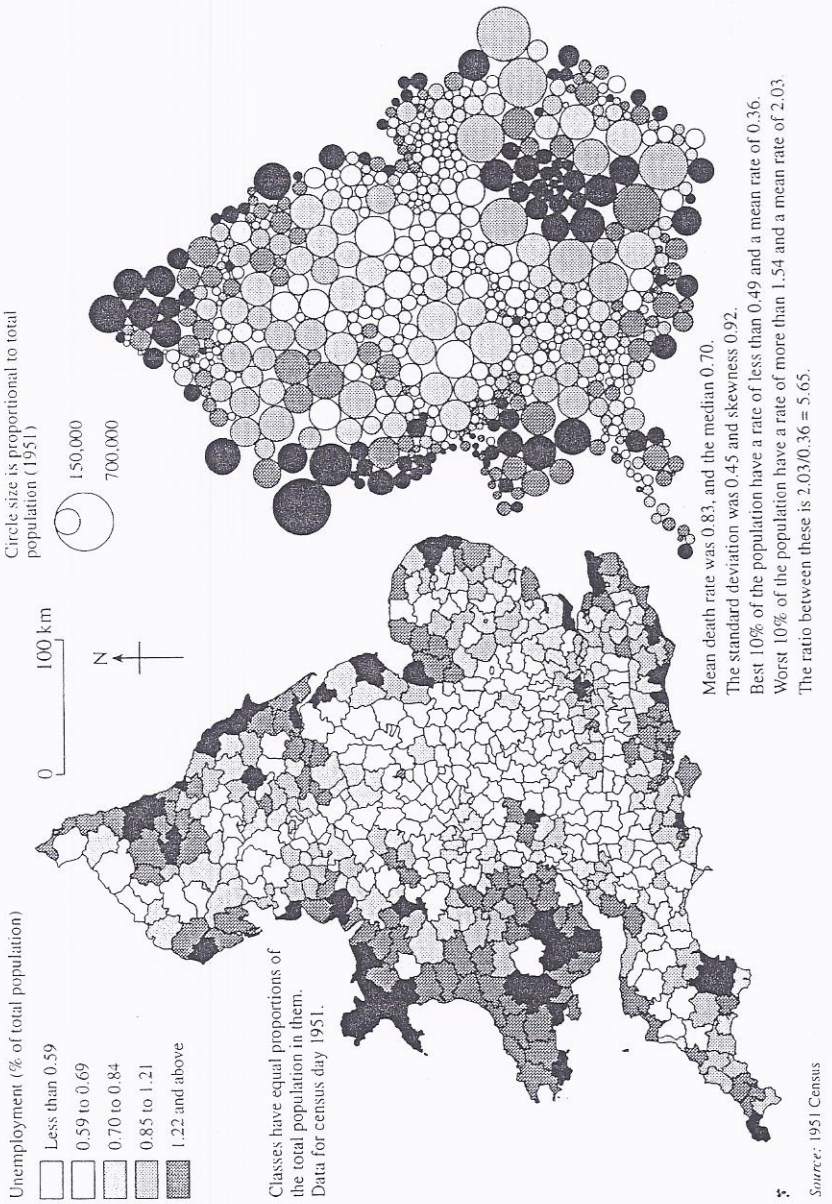

Figure 7.11 Unemployment, 1951 on 1898 RDs (census definition of unemployment)

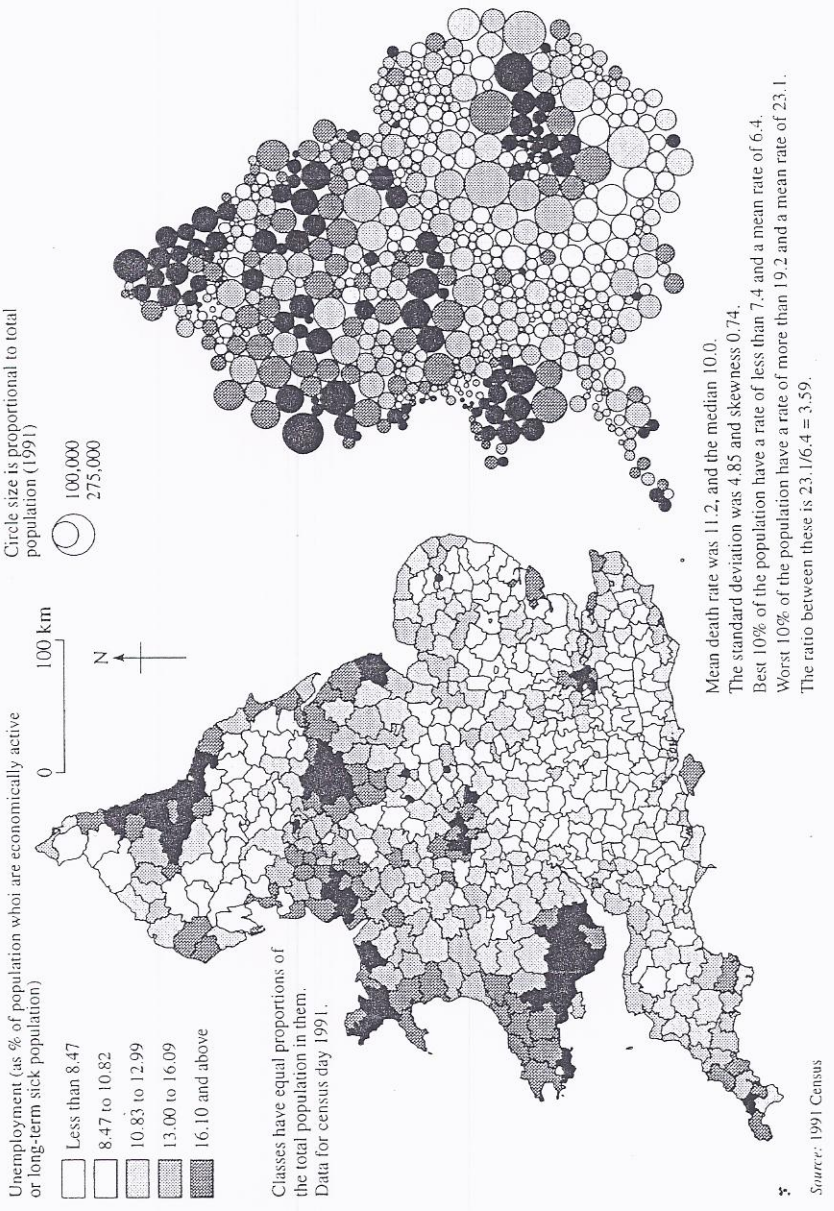

Figure 7.12 Unemployment, 1991 on 1898 RDs (based on census data

Conclusion

Table 7.2 summarises the statistical findings on poverty in England and Wales in the 100 years to 1998. Two sets of very general conclusions can be drawn. Firstly, the geographical patterns show a marked persistence of higher poverty in the periphery - the North, but also South Wales and often the remoter parts of the South West. In most maps, the major conurbations are worse off than adjacent rural areas, although in the mid-20th century significant areas of rural deprivation are apparent. London generally contained substantial deprived areas while surrounded by the affluent South East, but even so the worst conditions were to be found further north.

Secondly, the calculation of an index of relative poverty is inevitably crude but it is believed that for infant mortality and housing it is fairly robust. In particular, it must be emphasised that there is no statistical reason why lower absolute levels of the measures of poverty should inevitably lead to higher levels of relative poverty; that this seems to have happened says something about our society. What can be said is that the results may in part reflect the particular scale of analysis used: while this is at sub-county level, over much of the country, rural areas cannot be distinguished from towns, and if a century ago social segregation was primarily at the micro-scale, one street or neighbourhood versus another, the calculations used will tend to minimise it. However, as the figures show, much of the population was concentrated into the large urban centres where RDs covered relatively small and homogenous urban areas, so this problem should not be exaggerated. Completion of the full parish-level GIS should permit a more thorough investigation of these issues.

Overall, it is believed that despite its current limitations this paper provides significant evidence that over the last century an overall improvement in living standards has been accompanied by a steady rise in relative deprivation.

Table 7.2 Relative poverty in England and Wales, 1898 to present

	Descriptive Measures:				Best 10%:		Worst 10%:		
Variable	Mean	Median	St Dev	Skew	Cut-off	Mean	Cut-off	Mean	Ratio
Inf. Mort. 1890s	127.2	121.0	28.6	0.58	109.1	95.6	186.0	204.6	2.14
Inf. Mort. 1928	56.0	54.9	16.9	0.20	45.3	34.3	86.5	93.3	2.72
Inf. Mort. 1958	21.1	21.1	7.4	0.02	16.3	10.7	28.0	33.1	3.10
Inf. Mort. 1990s	3.86	3.73	2.65	0.14	2.39	1.04	5.59	7.86	7.57
O'crowd. 1901[1]	1.31	1.19	0.50	0.73	1.01	0.82	2.49	2.93	3.53
O'crowd. 1931[1]	0.82	0.73	0.34	0.82	0.58	0.48	1.68	1.79	3.73

Table 7.2 (continued)

O'crowd. 1931[2]	14.5	11.9	7.97	0.97	9.3	8.0	31.2	40.6	5.07
O'crowd. 1961[2]	4.63	4.01	2.57	0.71	2.81	2.16	9.69	13.01	6.01
O'crowd. 1991[2]	0.85	0.43	2.08	0.43	0.28	0.20	2.00	5.78	29.4
Unem. 1931	9.04	7.72	4.60	0.86	5.62	4.68	19.12	23.55	5.03
Unem. 1951	1.89	1.58	1.04	0.89	1.05	0.87	3.46	4.55	5.23
Unem. 1991	11.2	10.0	4.85	0.74	7.4	6.4	19.2	23.1	3.59

Notes: The 'cut-off' is the rate above or below which the top or bottom districts containing ten per cent of the population are found. The two 'means' to the right of the table refer to areas falling respectively above and below these cut-offs. The 'ratio' is the mean for the worst ten per cent divided by the mean for the best ten per cent. The measure of skewness is calculated by subtracting the median, multiplying this by three and dividing by the standard deviation. Overcrowding is calculated by two different methods that are not directly comparable.

[1] Method 1 for 1901-31 is based on households living in four rooms or less.

[2] method 2 for 1931-91 is based on the entire population.

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