



Health and its determinants in Scotland and other parts of post-industrial Europe:

The Aftershock of Deindustrialisation Study phase two



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two**

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Executive Summary

This is the second stage of a research project which compares health and its determinants in West Central Scotland with a number of other post-industrial European regions. The first stage was published in 2008 by the Glasgow Centre for Population Health and NHS Health Scotland in a report entitled 'The Aftershock of Deindustrialisation – trends in mortality in Scotland and other parts of post-industrial Europe'.

Post-industrial decline is often blamed for Scotland's – and particularly West Central Scotland's (WCS) – enduring poor health status. The first stage of research, therefore, sought to: (a) identify other regions in Europe which had experienced comparable levels of deindustrialisation; and (b) collect and analyse long-term trends in mortality for all the identified regions. The results showed that *mortality was generally lower in the other regions compared to WCS, and was improving faster.*

The aim of this second stage was to investigate the reasons why this was the case. Specifically, it sought to determine:

- whether WCS's relatively poorer health could be explained purely in terms of socio-economic factors (poverty, deprivation etc.).
- whether comparisons of other key health determinant data could identify important differences between WCS and other regions.

In addition, it drew on emerging results from accompanying research analysing the historical, economic and political context in key regions.

This report presents analyses of a range of data across twelve post-industrial regions in Europe (four in the UK, four in western mainland Europe, and four in eastern mainland Europe). These analyses are underpinned by illustrative examples from more in-depth comparisons between WCS and four particular regions within: Germany; France; Poland; and the Czech Republic. These case studies are published separately as four accompanying reports.

The principal findings of all these analyses are that:

- The vast majority of the post-industrial regions share important characteristics: deindustrialisation causes economic and social upheaval, and impacts on population health.
- The particular poor health status of WCS compared to the other regions cannot be explained in terms of current measures of poverty and deprivation: socio-economic conditions within WCS are similar to, or better than, many regions which have superior health profiles.
- Time series data do not provide convincing evidence that historical poverty is responsible for current poor health outcomes in WCS.
- Compared to other post-industrial regions in mainland Europe, income inequalities in WCS (and in the other UK regions) are greater.
- Health inequalities also appear to be wider in WCS.
- WCS also stands out in terms of a number of social factors: for example, proportionally higher numbers of its population live alone or as lone parents.
- Differences are also apparent in relation to aspects of child and maternal health: for example, there are relatively higher rates of teenage pregnancy and motherhood, and higher numbers of low birth-weight babies in WCS.
- Some of these distinguishing features – e.g. higher income inequalities, more lone parent households, more teenage mothers – are true also of the other UK post-industrial regions. These regions also share a recent economic history different to that experienced elsewhere in Europe.

- Of all the other deindustrialised regions in Europe, Merseyside appears the most similar to WCS: it shares almost all the adverse social and economic characteristics listed above. However, what distinguishes WCS from Merseyside is a poorer health profile.

What emerges from these observations is a picture that is only partially coming into focus. Poorer health in WCS can be attributed to three layers of causation. First, it is a deindustrialised region. This is a fundamental driver of poor health which WCS shares with all other regions that were part of this analysis. Second, by virtue of being part of the UK, WCS has experienced a set of economic policies and social trends which overlap with continental Europe but are, nonetheless, different in important ways. Chief amongst these are the more 'neo-liberal' economic policies pursued by the UK, higher levels of economic inequality and higher proportions of potentially vulnerable households. The third level has to do with unexplained factors which cause WCS to experience worse health outcomes than similar regions within the UK: in particular, WCS has worse health outcomes than regions like Merseyside which have remarkably similar histories and socio-economic profiles. That is why the picture is only partially in focus. The investigation is continuing with a programme of research focussing on the post-industrial cities of Glasgow, Liverpool and Manchester. Initial results are expected in early 2012.

Part One: Introduction

1.1 Background to the study

With the lowest life expectancy and highest mortality in Western Europe, Scotland's unenviable tag as the 'Sick Man of Europe' has been much publicised in recent years^{1,2}. Traditional explanations for the country's poor health status have focussed on post-industrial decline associated with socio-economic deprivation^{3, 4, 5, 6}. This argument is supported by the fact that West Central Scotland – the region in Scotland most profoundly affected by the process of deindustrialisation – is also the region with the poorest health^{7, 8, 9}. Furthermore, analyses of long-term trends in mortality show that Scotland's health has not always been poor in European terms: in the 1950s, Scotland's life expectancy was on a par with a broad number of Western European nations^{2,10}. However, in relative terms Scotland's position has worsened over subsequent decades, a decline particularly noticeable in the past 30 years – a period in which many of Scotland's traditional industries disappeared, and when the social and economic effects of that process became apparent.

There is no doubt that deindustrialisation and deprivation are damaging to health. However, in recent years, a number of studies have brought into question the extent to which Scotland's – and particularly West Central Scotland's – poor health profile is attributable solely to deindustrialisation and current levels of deprivation^{11,12,13,14}. In particular, 2008 saw the publication of 'The Aftershock of Deindustrialisation', a report by the Glasgow Centre for Population Health and NHS Health Scotland which investigated the link between deindustrialisation and health in more detail, with a specific focus on West Central Scotland (WCS)^{15,16,i}. This report (the principal findings of which are summarised briefly in the box below) identified a large number of regions in Europe (including the UK) which had – to a greater or lesser degree – experienced similar levels of deindustrialisation as WCS. However, detailed

ⁱ Note that in the first 'Aftershock' we referred to 'The West of Scotland' as the focus of analysis. In this report (and in a previous journal paper¹⁶) we define the region in identical terms, but use the more accurate description of 'West Central Scotland'.

analyses of health data showed that overall levels of mortality in these regions tended to be lower than in WCS and – crucially – were improving much faster (thus, mirroring the trends for Scotland as a whole compared to other European countries). This finding was complicated by the fact that data also suggested that WCS’s socio-economic profile was *superior* to that of the majority of these regions. This begs an obvious question: if the poor health profile of WCS is solely the consequence of deindustrialisation and its socio-economic impact, how can it be that other regions which have experienced similar economic and industrial histories, and which now appear materially more deprived than WCS, have better, and faster improving, health?

However, the first ‘Aftershock’ report was principally an investigation of mortality trends, and only very limited socio-economic data for the regions of interest were presented. Furthermore, the report could only speculate on the role of other important health determinants (e.g. education, health behaviours, environmental factors) and other important issues (e.g. income inequalities). A much more detailed investigation of these factors is required to obtain a better understanding of the differences in health profiles between WCS and other post-industrial areas. This current report describes a number of analyses that have been undertaken in an attempt to address this issue.

Box 1

The 'Aftershock of Deindustrialisation' report

With a full title of 'The Aftershock of Deindustrialisation – trends in mortality and other parts of post-industrial Europe', this report was published in April 2008. The aims of the research were to:

1. *identify other European regions which had experienced similar histories of deindustrialisation as WCS;*
2. *undertake a detailed collation and analysis of 20-year trends in mortality for a wide range of causes for each region.*

The results of the study were as follows:

- *twenty 'candidate' regions in nine countries were identified, of which ten were selected for in-depth analysis*
- *overall health (as measured by life expectancy) of virtually every comparable region was better, and improving faster, than WCS*
- *the relatively poor rates of improvement in the WCS were particularly driven by high rates of mortality among (a) younger, working-age, Scottish males and (b) middle aged Scottish females*
- *among younger WCS males, mortality had been increasing, in sharp contrast to the experience of the majority of the other regions; notably high, and increasing, rates of suicide, liver cirrhosis mortality, and deaths from 'external causes' (a grouping which included a number of causes, including violence) were apparent*
- *middle aged WCS females had notably higher mortality rates for a number of different cancers, as well as strikingly different rates for other causes such as chronic obstructive pulmonary disease (COPD) and liver cirrhosis*
- *limited socio-economic data (for one time period, and at regional level only) suggested that the majority of the European regions compared less favourably than WCS in terms of socio-economic indicators (wealth, unemployment, educational attainment etc.)*
- *Note that these findings are discussed in more detail (with some illustrative examples of the data) in Section 2.2.*

1.2 Aims

The overall aim of this research was to obtain, using routinely available data, a greater understanding of the reasons why WCS experiences poorer health than other, comparably deindustrialised, European regions. In particular, the project focussed on two research questions:

1. Can WCS's relatively poorer health status be explained purely in terms of socio-economic factors (poverty, deprivation etc.)?
2. Do comparisons of other health determinant information identify important differences between WCS and other regions?

These questions are addressed in this report by focusing on the elevenⁱⁱ comparator European regions that were highlighted in the first 'Aftershock' report, but with a specific focus on four that were investigated in more detail: these are the regions (Nord-Pas-de-Calais and the Ruhr in western mainland Europe; Silesia and Northern Moravia in eastern mainland Europe) which are most comparable in terms of the levels of deindustrialisation experienced. As outlined in more detail below, these regions are also the focus of an accompanying piece of research examining the historical, economic and political context in each region – an important aid to the interpretation of the data. In addition, we also specifically highlight a fifth region from the UK, which is more culturally comparable to the WCS than some other European areas, and which has also been the focus of related research undertaken by some of the authors. All the regions included in the study are discussed in the next section of the report.

ⁱⁱ In the latter half of the first 'Aftershock' report, we compared WCS with *ten* (rather than eleven) other post-industrial European regions. These were selected from an original list of 20 'candidate' areas. The selection was made principally on the basis of picking one region per country. Where more than one post-industrial region in a country had been identified, the region with the poorest health was selected (to match the fact that WCS has the poorest health in Scotland). An exception was made in the case of Germany, where two areas were selected: one from the former West Germany (The Ruhr) and one from the former DDR. In relation to the latter, Saxony was chosen in preference to Saxony-Anhalt, despite Saxony-Anhalt's higher mortality rates. This was simply because relevant data could not be obtained for this region. In this report, however, we address this issue by additionally including data for Saxony-Anhalt where possible.

Comparisons of data: interpretation and approach

In addressing these aims, comparisons are made using multiple indicators drawn from a large number of geographical areas. The weaknesses inherent in this approach are stressed at this stage as they influence how results are interpreted:

1. This approach relies on routinely available data, and this limits the information available.
2. The nature of these data does not allow hypotheses to be tested in the manner that would be possible using, for example, a new cohort study.
3. The use of information derived from such a variety of sources leads to issues of data comparability.
4. Cultural and social context changes the meaning of some data: for example, home ownership is often used in the UK as a proxy for material circumstances, with the more affluent areas of Scotland and England characterised by high levels of owner-occupied properties. In some European countries, however, renting of properties is more common, and in some it is the 'cultural norm'. Similarly, car ownership is frequently used in the UK as a proxy for income: however, comparisons across European countries can be misleading.

Our approach has been to maintain awareness of these difficulties when making comparisons, and to ensure that relevant issues of compatibility/comparability are appropriately highlighted.

These data weaknesses should not, however, obscure the key strength of the approach employed. With comparative analysis of such a large amount of data it is still possible for a 'bigger picture' to emerge. Thus, we have tried to focus on what the data *in their entirety* tell us about these regions. Rather than focussing on the appropriateness and precise compatibility of individual indicators in particular regions, we have instead tried to emphasise what the data, taken as a whole, seem to tell us, and what the important messages seem to be.

1.3 Structure of the report

In an attempt to make the results of the research as clear as possible (a major challenge, given the number of different analyses that have been undertaken, and the different settings to which the data relate), the report has been structured as follows:

- *Part Two* contains a description of the regions
- In *Part Three*, data have been assembled under familiar, public health related, headings: *health and function; prosperity and poverty* (including both absolute and – equally importantly, given the recent evidence of the impact of inequalities in income on health – relative measures); population-related factors; the *social environment* (including education, and vulnerable households); the *physical environment; behavioural factors; and child and maternal health*. In each case, we attempt to show data for all twelve regions (including WCS), where that has been possible. In addition, we illustrate particular indicators or themes with more detailed insights from the in-depth case studies that have been carried out for our five ‘core’ regions.
- The results are summarised and discussed in *Part Four*.

The four main case studies are published as separate, accompanying, reports.

Part Two: The regions

2.1 The regions: overview and context

Introduction

In the first ‘Aftershock’ report, an initial identification of twenty regionsⁱⁱⁱ (deemed comparable to WCS in terms of their history of deindustrialisation) gave way to a more focussed examination of ten areas^{iv}. These were:

- **Katowice/Silesia (Poland)**^v
- Limburg (Netherlands)
- **Merseyside (England)**
- **Nord-Pas-de-Calais (France)**
- Northern Ireland^{vi}
- **Northern Moravia (Czech Republic)**
- **Ruhr (Germany)**
- Saxony (Germany)
- Swansea & South Wales Coalfields (Wales)
- Wallonia (Belgium).

All ten are shown on the map in Figure 2.1, alongside Saxony-Anhalt in Germany (which is additionally included in this report^{iv}) and WCS. The five areas marked in bold above are the focus of the detailed case studies which are either published as separate, accompanying reports (Katowice/Silesia;

ⁱⁱⁱ Note that throughout this report (as was the case in the first ‘Aftershock’ report) we use the term ‘region’ in its general sense of an area within a country. This includes not only areas which are political/administrative regions (e.g. German federal states, French régions), but also other areas which are not (e.g. West Central Scotland, Northern Moravia).

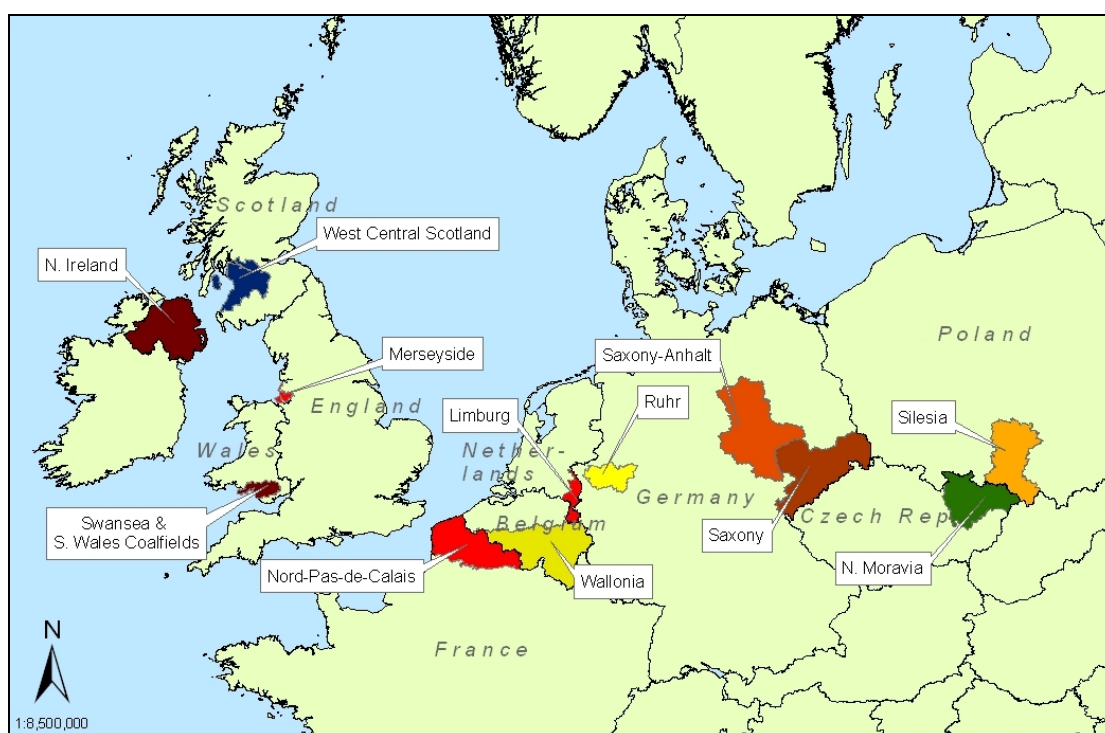
^{iv} As explained in an earlier footnote, the selection of ten areas was made principally on the basis of picking one region per country. Where more than one post-industrial region in a country had been identified, the region with the poorest health was selected (to match the fact that WCS has the poorest health in Scotland). An exception was made in the case of Germany, where two areas were selected: one from the former West Germany (The Ruhr) and one from the former DDR. In relation to the latter, Saxony was chosen in preference to Saxony-Anhalt, despite Saxony-Anhalt’s higher mortality rates. This was simply because relevant data could not be obtained for this region. In this report, however, we address this issue by additionally including data for Saxony-Anhalt where possible.

^v Note that the Polish region referred to as ‘Katowice’ in the first ‘Aftershock’ report is principally referred to as ‘Silesia’ in this report. The reasons for this are explained in Section 3.1.

^{vi} For simplicity, we refer – as in the previous work – to Northern Ireland as a ‘region’. Clearly, however, in Northern Ireland’s case, and in a UK context, the term ‘country’ also applies.

Nord-Pas-de-Calais; Northern Moravia; The Ruhr – all based on collaborative research with colleagues in the regions’ respective countries), or – in the case of Merseyside – where we draw on other relevant research for this region. In this section we present a brief overview of the regions in terms of: key facts, experiences of deindustrialisation, important contextual factors, and some selected health issues.

Figure 2.1^{vii}



Overview

The first ‘Aftershock’ report includes reasonably detailed descriptions of each region in terms of population size, geographical components, and histories of industrialisation and deindustrialisation. Table 2.1 below presents a brief summary of some of these factors. A more detailed insight is available from the original ‘Aftershock’ report and from Appendix D (Selected Further Reading) of this document. Note also that Appendix C details the geographical composition of each region in terms of relevant sub-geographies, administrative make-up, and other relevant definitional factors.

^{vii} Note that map is not to scale.

Table 2.1

Region	Country	Population ^{viii}	Industrial Employment Peak ^{ix}	Principal Historical Industries	Total Industrial Employment Loss ^x
Katowice (Silesia)	Poland	4.1m	1977	Coal, steel, automobiles, zinc	-55% (1980-2005)
Limburg	Netherlands	1.1m	1965	Coal	-16% (1968-2005)
Merseyside	England	1.4m	1965	Shipping, docks, manufacturing (e.g. cement) engineering	-63% (1971-2005)
Northern Moravia^{xi}	Czech Republic	1.9m	1986	Coal, steel	-19% (1993-2005)
Nord-Pas-de-Calais	France	4.0m	1974	Coal, textiles, steel	-43% (1970-2005)
Northern Ireland	Northern Ireland	1.7m	1965	Shipbuilding, textiles, manufacturing	-20% (1971-2005)
Ruhr area	Germany	5.3m	1970 (West Germany)	Coal, iron steel	-54% (1970-2005)
Saxony	Germany	4.3m	1985 (GDR)	Steel, construction, engineering, textiles	-47% (1991-2005)
Saxony-Anhalt	Germany	2.5m	1985 (GDR)	Chemicals, coal, aircraft & automobile construction	-45% (1991-2005)
Swansea & South Wales Coalfields	Wales	1.1m	1965	Coal	-51% (1971-2005)

^{viii} Population at 2005 for all regions except those in France, for which the year is 2003. See Appendix A for relevant data sources.

^{ix} Employment peak of the parent country, rather than the region.

^x This column shows the percentage decrease in the number of industrial jobs in each region over the time period shown in parentheses. The time period is between a 'base' year and 2005. For Western European areas, the base year is the year closest to 1970 (the peak year of industrial employment in Western Europe) for which industrial employment data were available at the time of undertaking the analysis. For the Central and Eastern European regions, data availability largely determined the base year: 1980 for Katowice/Silesia, 1991 for Saxony and 1993 for Northern Moravia. Nonetheless, these dates are close to the peaks of industrial employment for their parent countries. Further details are available from the first 'Aftershock' report.

^{xi} As outlined in the Northern Moravia case study, this part of the Czech Republic is made up of two Czech 'kraje' (regions): Moravskoslezský and Olomoucký, of which the former is arguably the more 'relevant' part of Northern Moravia for this report, being more industrial (and deindustrialised) than its neighbouring *kraj*. For the sake of consistency, however, in this report (as in the first 'Aftershock' report) we present data for the Northern Moravian region as a whole. However, in the case study, data are – where possible – presented separately for the region's two constituent parts.

Region	Country	Population ^{viii}	Industrial Employment Peak ^{ix}	Principal Historical Industries	Total Industrial Employment Loss ^x
Wallonia	Belgium	3.4m	1971	Mining, metal working, textiles	-39% (1970-2005)
West Central Scotland	Scotland	2.1m	1965	Shipbuilding & support industries (iron, coal, engineering)	-62% (1971-2005)

As Table 2.1 shows, the regions differ in size, and also in terms of the types of industries that were established within their borders. In addition, some areas have been deindustrialised to a lesser or greater extent than others, and some (e.g. Katowice in Poland) still have an important industrial element to their economies despite the loss of much of their industrial base^{xii}. However, all regions share a common experience: they have all suffered profoundly from the effects of the loss of these industries and the associated loss of employment. In the case of Katowice/Silesia, for example, although industry remains an important part of its modern day economy, the region experienced the loss of almost half a million industrial sector jobs over a relatively short time period. In West Central Scotland around 300,000 industrial jobs have been lost since the 1970s.

Thus all the regions have shared experiences of industrialisation and subsequent adjustment to deindustrialisation. The impact of these structural economic changes has been profound in all regions and persistent in most. In nine of the twelve regions, rates of poverty and joblessness remain among the highest (if not the highest) recorded in their parent countries.

^{xii} By 2005, fewer than one in four employed worked in industry in WCS, Wallonia, Merseyside, Limburg and Northern Ireland. The figure was slightly higher (28-33%) in the Ruhr, Swansea & the S. Wales Coalfields and Saxony. In Katowice and Northern Moravia, industrial employment still accounted for four of every ten jobs.

For example:

- West Central Scotland remains the most socio-economically deprived region of Scotland. For example, of the twelve local authority areas with the highest levels of ‘income deprivation’^{xiii} in Scotland, nine are located within WCS¹⁷.
- In Nord-Pas-de-Calais, nearly one-in-five (18.5%) of the population were at risk of poverty in 2007, well above the French average (13.4%) and the highest of any French region except Languedoc-Roussillon¹⁸. Unemployment rates in the region have been among the highest in France for many years^{xiv}.
- In the Ruhr area, the male unemployment rate was 10% in 2007, compared to a German average of 7.8%¹⁹.
- In 2010, 22.1% of Merseyside resident were classified as ‘income deprived’, considerably higher than the English average of 14.5%: in the city of Liverpool this increased to 27%²⁰.

The partial exceptions to this rule are Limburg (where poverty rates are close to, and unemployment rates only slightly higher, than the national average) and Silesia (where unemployment and relative poverty rates are below the national average). In these regions, a uniquely favourable mix of geographic location, public policies and inward investment^{21, 22} not available to the other areas may have been beneficial to economic recovery^{21, 22}. This illustrates the more general point that we cannot ignore important differences in the nature of the regions, nor in particular aspects of the deindustrialisation processes each has experienced. The different historical, political and economic contexts of the core regions are the subject of additional research being undertaken to accompany the work presented in this report. We discuss this further in Part Four.

^{xiii} See section 3.3 for a definition, and further analyses of, ‘income deprivation’.

^{xiv} In 1982-84, the unemployment rate was 10%, the highest (alongside Languedoc-Roussillon (also 10%)) of any region. In 2008-10, the rate was 12% - again, the highest rate alongside Languedoc-Roussillon (also 10%) (Source: INSEE).

2.2 Health in post-industrial regions

The first phase of this project highlighted a number of important aspects of population health in post-industrial regions of Europe. In this section we briefly revisit three sets of analyses and highlight other relevant work that has been undertaken since the publication of the first 'Aftershock' report.

1) Poor health as a characteristic of post-industrial regions

In the same way that the deindustrialised region of WCS has the poorest health (highest mortality) in Scotland^{xv}, so too do the health profiles of the other deindustrialised regions compare poorly with those of their own respective 'parent' countries. For example:

- In Germany, Saxony-Anhalt has the highest male mortality rate of any of the German *Länder*^{xvi}, while rates in both Saxony and the Ruhr are among the highest rates of any comparably sized regions in the country.
- Nord-Pas-de-Calais has higher all-cause mortality rates for both males and females than any other French *région*^{xvii}.
- The Silesia region containing the Katowice conurbation exhibits the second highest level of mortality for females in Poland, and the fifth highest (out of 16 regions) for males.
- Of the two *kraje* (provinces) that make up the Czech region of Northern Moravia, Moravskoslezsky has the second highest mortality rates in the country, with those of Olomoucky also comparatively high.
- In England the five counties with the highest mortality rates are all areas which have experienced post-industrial decline. These include Merseyside, the county with the highest levels of mortality in the country.
- A similar picture is evident in Wales, with the local authority areas which make up the South Wales Coalfields region (e.g. Merthyl Tydfil, Blaneu

^{xv} As the first 'Aftershock' report stated: 'for the period 2003/05 all-cause mortality rates in WCS were 11% (males) and 8% (females) higher than those of Scotland as a whole, with the equivalent figures for the Greater Glasgow & Clyde area (the NHS board with the highest mortality rates in Scotland) being 17% and 10%. Furthermore, of the five local authority areas with the highest mortality rates in Scotland in 2005 (for both sexes), four fall within WCS'.

^{xvi} The German *Länder* (singular: Land) are the country's Federal States.

^{xvii} The main administrative regions of France.

Gwent) exhibiting higher mortality rates than any other local authority areas.

- Trend data back to the 1970s show that poor health has been a historically persistent characteristic of the majority of these regions.^{xviii,23, 24, 25,26}

In addition, and as reported elsewhere in this document, other aspects of health tend to compare poorly in these regions compared to their parent countries. For example:

- obesity levels in Nord-Pas-de-Calais are the highest in France²⁷
- adult smoking rates in North-Rhine Westphalia (the 'Land' which includes The Ruhr region) are the highest of any West German federal state²⁸
- Merseyside has the highest rate of deaths from chronic liver disease of any English county, for both males and females²⁹
- levels of ill-health (as measured by UK Incapacity Benefit uptake rates) in Swansea & S. Wales Coalfields in 2008 were not only the highest in Wales, but among the highest in the UK³⁰
- self-assessed health in Wallonia is poorer than in the other Belgian regions³¹

The story of West Central Scotland as a region which has experienced the effects of deindustrialisation and which now exhibits the poorest health profile in its parent country is, therefore, not a unique one.

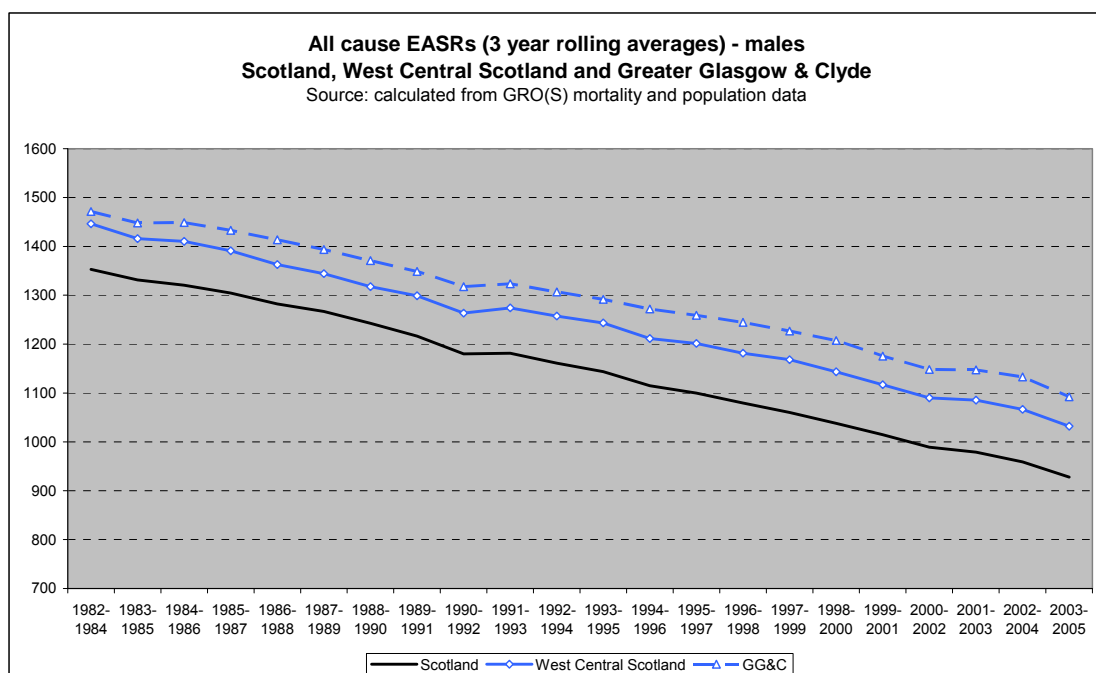
2) Region vs. country inequalities in health

Analyses were also undertaken to establish whether the regions' poor health status was improving or worsening over time relative to their parent countries. In other words: is the health gap between region and country narrowing, widening, or remaining static?

^{xviii} Almost all the regions selected had historically poor health within their own countries. In the mid-1970s, life expectancy in the eight West European regions²³ and Katowice in Poland²⁴ was among the lowest (if not the lowest) recorded within their parent countries. Northern Moravia (where life expectancy in the mid-1970s was similar to the Czech Republic average²⁵) and the two East German regions (with life expectancy high compared to the East German average²⁶) are partial exceptions to this.

Figure 2.2 shows trends in all-cause mortality rates (European age-standardised rates (EASRs)) for males in Scotland, WCS and Greater Glasgow & Clyde (all ages). It is clear that the gap between WCS (and, especially, Greater Glasgow & Clyde) and the country as a whole has been widening in recent years. In 1982/84 mortality rates in WCS were around 7% higher than the national rates; by 2003/05 that had increased to 11%. The equivalent figures for Greater Glasgow & Clyde relative to Scotland are 9% and 18%.

Figure 2.2



Figures 2.3 and 2.4 show similar widening gaps in relation to all-cause mortality in the Ruhr^{xix} (males) and Merseyside (females) (and it should be noted that a similar widening gap is also evident for females in the former region and males in the latter).

^{xix} Note that due to unification, mortality rates for Germany are only shown back to 1990.

Figure 2.3

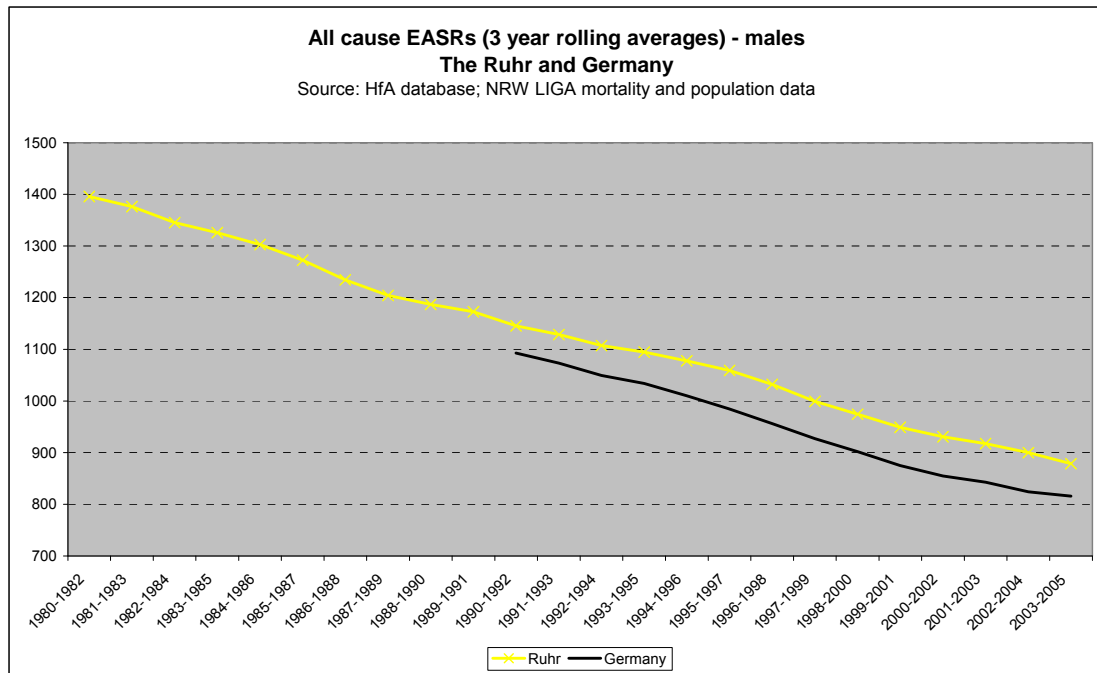
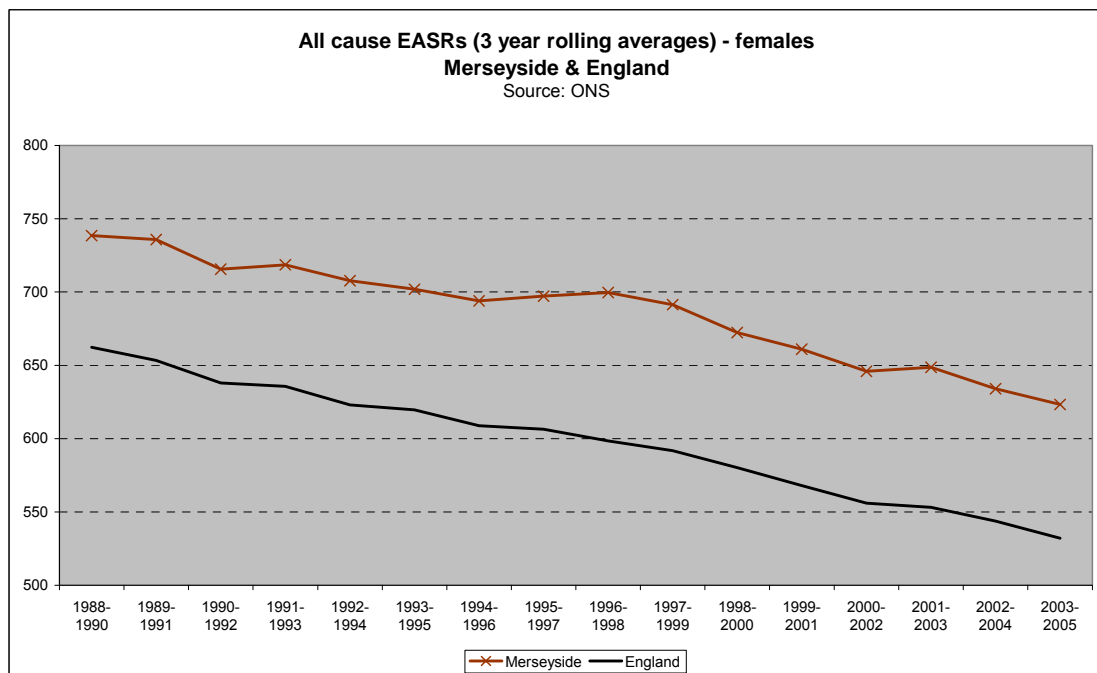


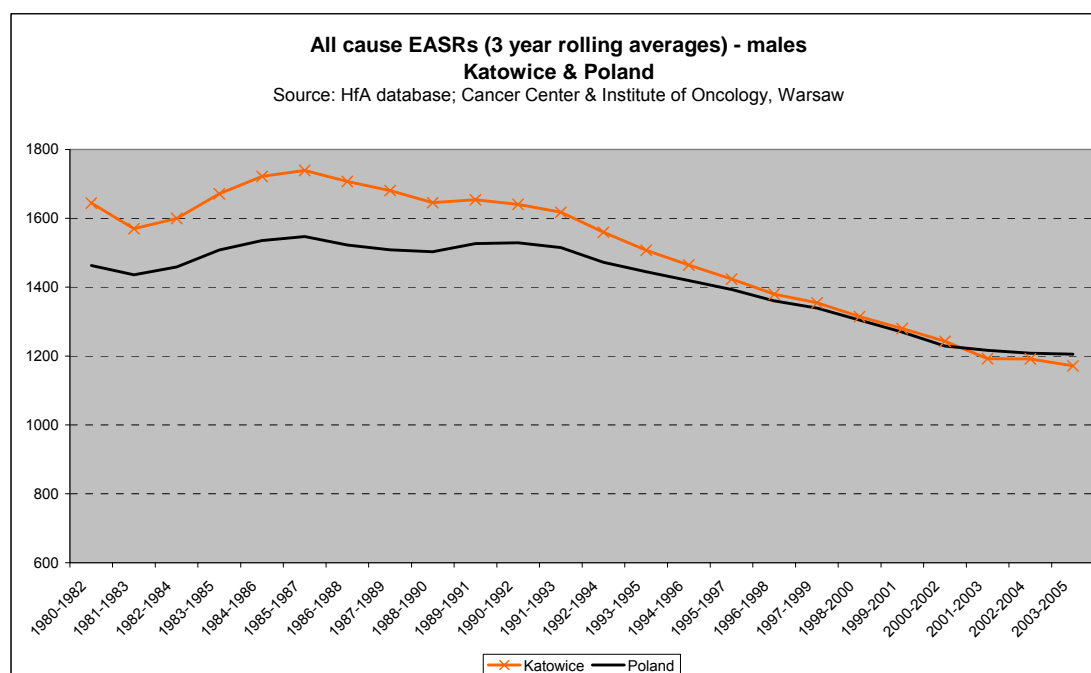
Figure 2.4



In contrast, mortality rates in Katowice/Silesia have been improving relative to the Polish national position. As Figure 2.5 shows, while rates in this post-industrial part of Poland were once 12% higher (in 1980/82), by 2003/05 they were on a par with the national figure (indeed, were slightly lower). Similar

relative improvements can be seen in Saxony (for males: 14% higher in 1990/92, 4% higher in 2003/05; for females: 15% higher in 1990/02; 6% lower in 2003/05) and Nord-Pas-de-Calais (male rates 35% higher in early 1980s, reducing to 28% by early 2000s; female rates reducing from 30% higher to 20% higher over the period). Northern Ireland's mortality rates relative to the rest of the United Kingdom have also improved: for example, male rates were 9% higher in early 1980s, but only 2% higher 2003/05.

Figure 2.5



The gaps between regional and national rates have neither narrowed nor widened significantly in Limburg, Northern Moravia and Swansea and S. Wales Coalfields.

Table 2.2 below attempts to summarise these trends by showing the regional/national all-cause mortality ratios at two points in time for each region.

The ratios are calculated by dividing the mortality rate of the region divided by that of the country: in the case of Merseyside, for example, the 'start ratio' for males of 1.13 means that mortality rates were around 13% higher in

Merseyside compared to England at that time. The changes in ratios are difficult to compare across regions because of the different time periods involved (e.g. at the time of undertaking the analyses, data for Katowice were available for a 25 year period (1980-05), whereas for Northern Moravia they were only available for 13 years (1991-04)). However, Table 2.2 still highlights differences in trends for the post-industrial regions – the position of some improving over time relative to their countries, while the position of others (such as WCS) having worsened^{xx}.

Table 2.2^{xxi}

Mortality inequalities: comparison of regional/national rates ratios over time

<u>Males</u>	Region	Country	Start period	End period	No. Years	Start ratio	End ratio	+/-
	Katowice	Poland	1980/82	2003/05	25	1.12	0.97	-
	Saxony	Germany	1990/92	2003/05	15	1.14	1.04	-
	N. Ireland	UK*	1980/82	2003/05	25	1.09	1.02	-
	Nord-Pas-de-Calais	France	1983	2003	20	1.35	1.28	-
	Wallonia	Belgium	1987/89	1995/97	10	1.13	1.12	-
	Swansea & S. Wales Coalfields	Wales	1988/90	2002/04	17	1.08	1.09	+
	Limburg	Netherlands	1994/96	2002/04	11	1.07	1.09	+
	N. Moravia	Czech Repub	1991/93	2002/04	13	1.04	1.06	+
	Ruhr	Germany	1990/92	2003/05	15	1.05	1.08	+
	West Central Scotland	Scotland	1982/84	2003/05	23	1.07	1.11	+
	Merseyside	England	1988/90	2002/04	17	1.13	1.18	+
	Greater Glasgow & Clyde	Scotland	1982/84	2003/05	23	1.09	1.18	+
<u>Females</u>	Region	Country	Start period	End period	No. Years	Start ratio	End ratio	+/-
	Saxony	Germany	1990/92	2003/05	15	1.15	0.94	-
	N. Ireland	UK*	1980/82	2003/05	25	1.09	0.99	-
	Katowice	Poland	1980/82	2003/05	25	1.13	1.02	-
	Nord-Pas-de-Calais	France	1983	2003	20	1.30	1.20	-
	Wallonia	Belgium	1987/89	1995/97	10	1.15	1.09	-
	Limburg	Netherlands	1994/96	2002/04	11	1.04	1.05	+
	N. Moravia	Czech Repub	1991/93	2002/04	14	1.00	1.01	+
	Swansea & S. Wales Coalfields	Wales	1988/90	2002/04	17	1.05	1.07	+
	West Central Scotland	Scotland	1982/84	2003/05	23	1.07	1.08	+
	Greater Glasgow & Clyde	Scotland	1982/84	2003/05	23	1.07	1.10	+
	Ruhr	Germany	1990/92	2003/05	15	0.99	1.04	+
	Merseyside	England	1988/90	2002/04	17	1.11	1.17	+

* UK being used for comparison with Northern Ireland because all (rather than region) of N.Ireland has been used in the analysis

^{xx} One could argue that WCS's position could be shown to have worsened even more if its 'parent' country were deemed to be the UK, rather than Scotland. However, throughout this project we have analysed and presented data for WCS in the context of Scotland, rather than the UK. Clearly, however, Scotland has been subject to economic policies generated by UK governments, and even after the re-establishment of Scottish Parliament in 1998, Scotland's fiscal powers remain very limited. This issue is clearly also relevant to the discussion of income inequalities in Section 3.4.

^{xxi} Note that the regions in the table are ordered by the difference between the 'start ratio' and the 'end ratio'. Thus, for males Katowice is the region that has seen the greatest narrowing of the gap, and Greater Glasgow & Clyde the area that has seen the greatest widening of the gap.

3) Trends in mortality and life expectancy: WCS compared to other key regions

As outlined in Box 1 in Section 1.1, the main results of the mortality analyses undertaken for the first 'Aftershock' report can be summarised under four headings:

i) overall health (as measured by life expectancy) of virtually every comparable region was better, and improving faster, than WCS.

This is illustrated in Figures 2.6 and 2.7, showing trends in male and female life expectancy respectively. WCS males have lower life expectancy than every region except Katowice and Northern Moravia. However, the rates of improvement of life expectancy in these regions compared to WCS suggest that these regions will overtake WCS in around 10 years' time if current trends continue. Indeed, this has already happened among females: WCS females currently have lower life expectancy than every other selected region (Figure 2.7), with improvement rates again faster in the other comparator regions.

Figure 2.6

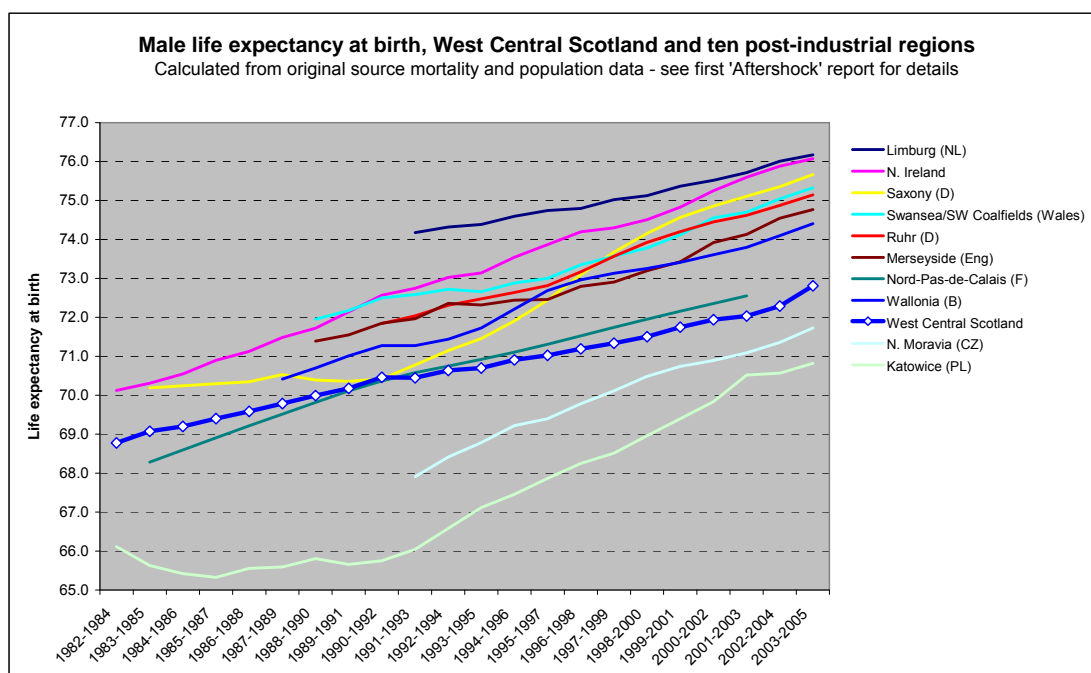
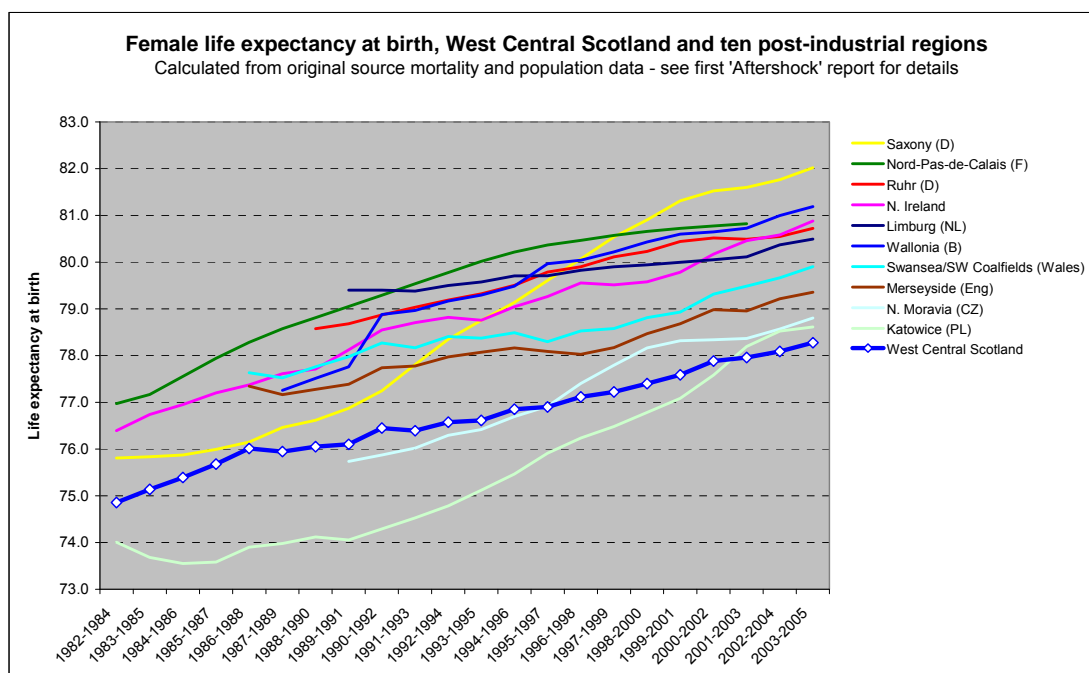


Figure 2.7



ii) the relatively poor rates of improvement in the WCS were particularly driven by high rates of mortality among (a) younger, working-age, Scottish males and (b) middle aged Scottish females

Figure 2.8 shows – in a summarised format borrowed from Leon et al³² – all-cause standardised mortality rates for WCS males aged 15-44 years compared to the maximum, minimum and mean rates recorded in other regions (plus WCS itself). The contrast between the rates of WCS males of this age and their counterparts in regions which have undergone similar industrial decline is clear: while rates have generally been rising in WCS since the start of the 1990s, the opposite is true of the other regions.

Figure 2.8

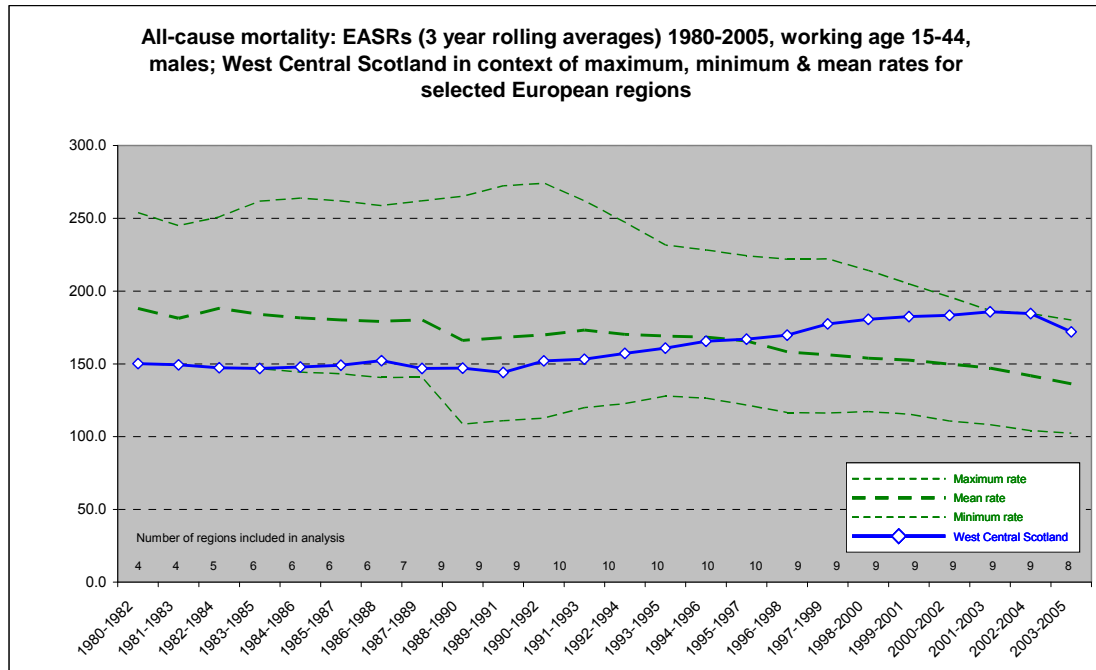
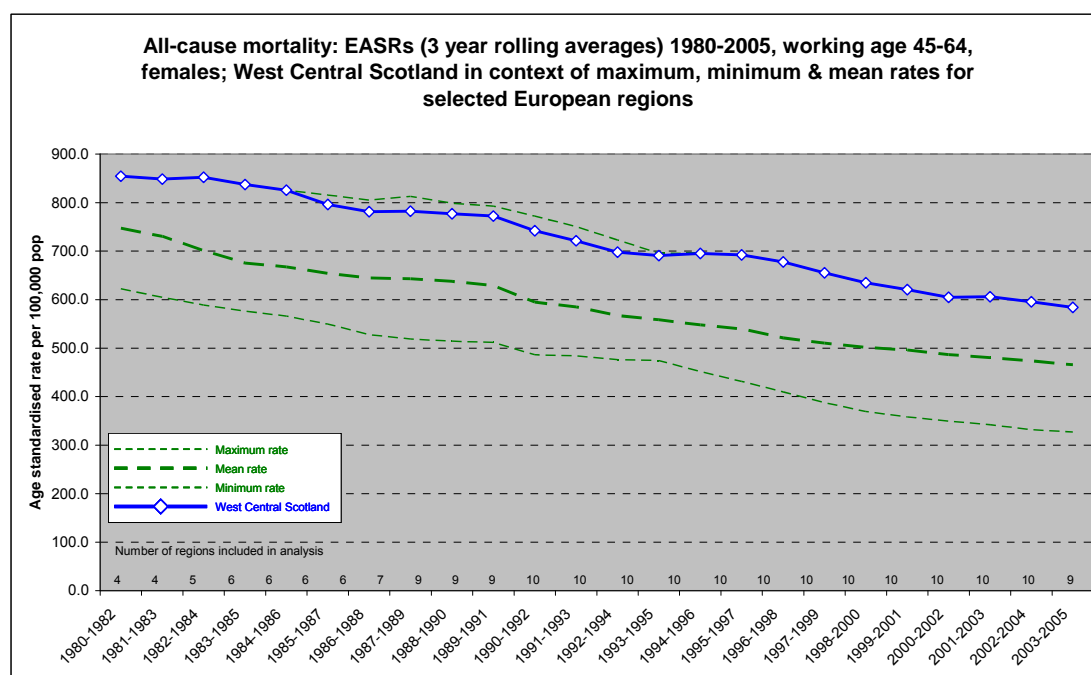


Figure 2.9 presents data in the same format for females aged 45-64. Although WCS all-cause rates among *males* in this age group lie consistently around the average of all the regions (data not shown), this contrasts markedly with the picture for females in this age group. Although the trend is not out of kilter with other regions, WCS females have the highest mortality rates of all the regions analysed, and this has been the case for most of the 25 years for which we have comparable data.

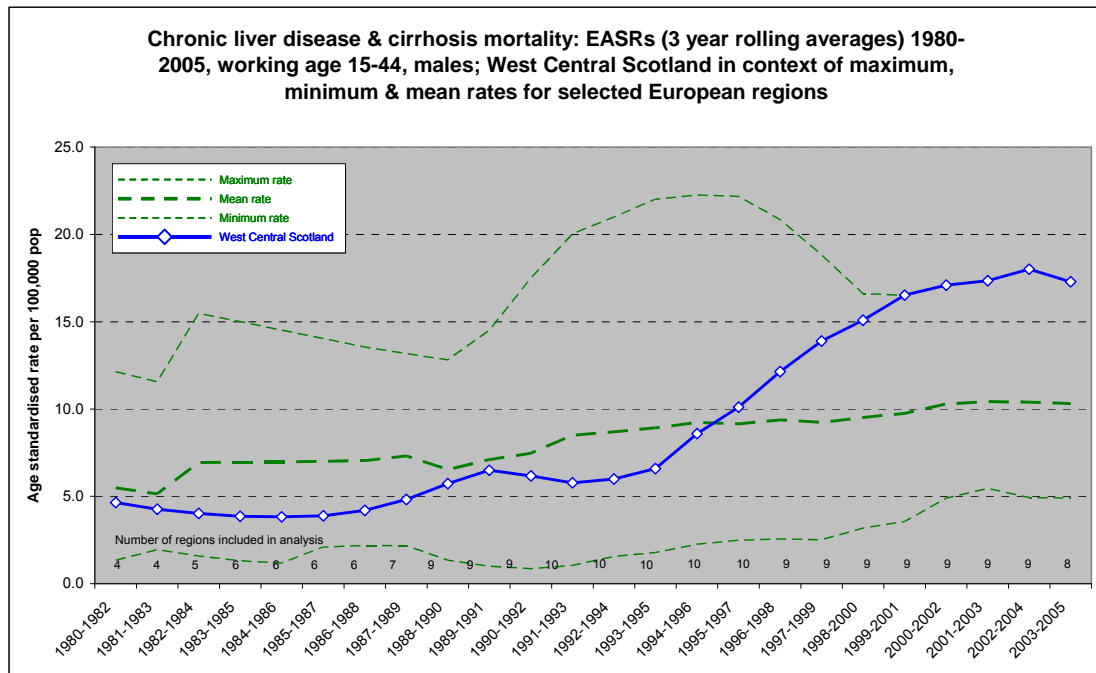
Figure 2.9



iii) Among younger WCS males, mortality increased in recent years, in sharp contrast to the experience of the majority of the other regions; notably high, and increasing, rates of suicide, liver cirrhosis mortality, and deaths from 'external causes' (a grouping which included a number of causes, including violence) were apparent.

Figure 2.10 shows the influence of alcohol harm among males of this age group, with a striking increase in mortality from chronic liver disease and cirrhosis having occurred over the past 25 years in WCS. The region's relative position altered from being significantly below the regional average in the earlier years of the analysis to being the highest of all the post-industrial regions analysed: rates increased from 4.6 per 100,000 population in 1980/82 (16% lower than the average for all the regions) to 17.3 per 100,000 population in 2003/05 (62% higher than the regional average).

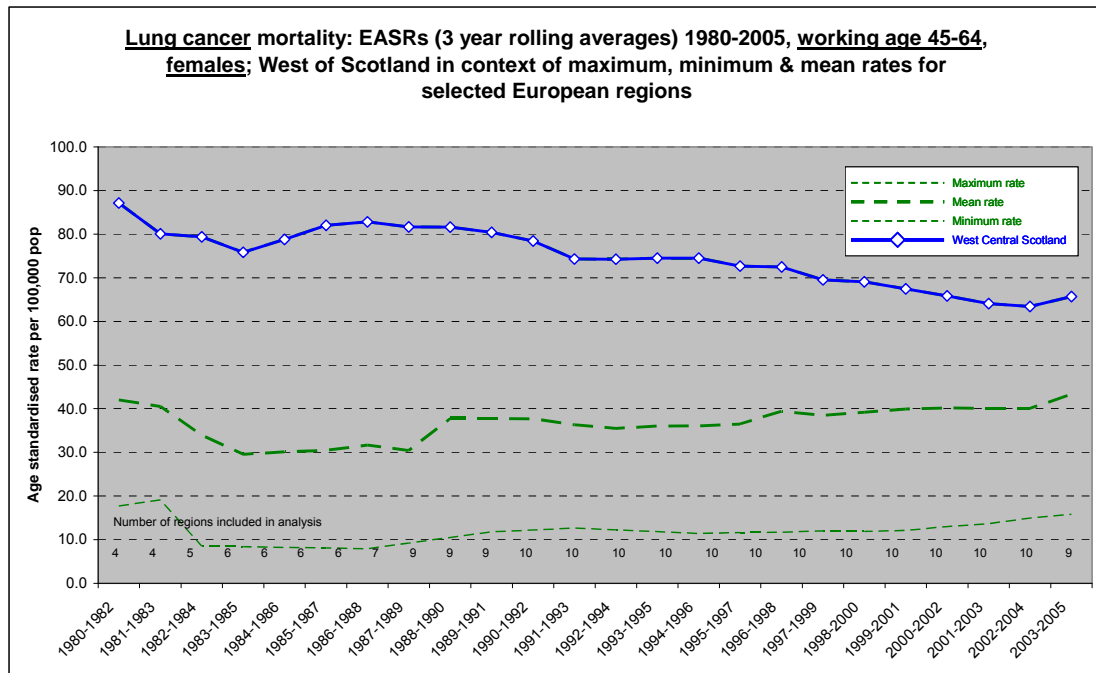
Figure 2.10



iv) Middle aged WCS females had notably higher mortality rates for a number of different cancers, as well as strikingly different rates for other causes such as chronic obstructive pulmonary disease (COPD) and liver cirrhosis.

As one example, Figure 2.11 shows the significantly higher mortality rate for lung cancer among WCS females in this age group compared to the other regions.

Figure 2.11



A much more detailed set of these mortality analyses is available from the first 'Aftershock' report. Such clear differences in health outcomes between WCS and other comparably deindustrialised regions of Europe begs the question: why? Through detailed investigation of routine data, this report aims to obtain a greater understanding of the reasons behind this situation.

Part Three: An overview of health and its determinants in selected post-industrial regions of Europe

3.1 Preface to the presentation of data in Part Three

Geographies

This part of the report compares a large number of health and well-being related indicators across the post-industrial regions. As outlined in the introduction, we have sought to do this by using existing data sets (from different surveys and different administrative sources) rather than by collecting new data. Wherever possible we have used data which exactly correspond to the geographical definitions of the regions used in the first 'Aftershock' report (see Appendix C for more details). However, this was not always possible for all the indicators and for all the regions. On occasions, therefore, we have been forced to use data for 'proxy' areas. These are discussed briefly below.

West Central Scotland

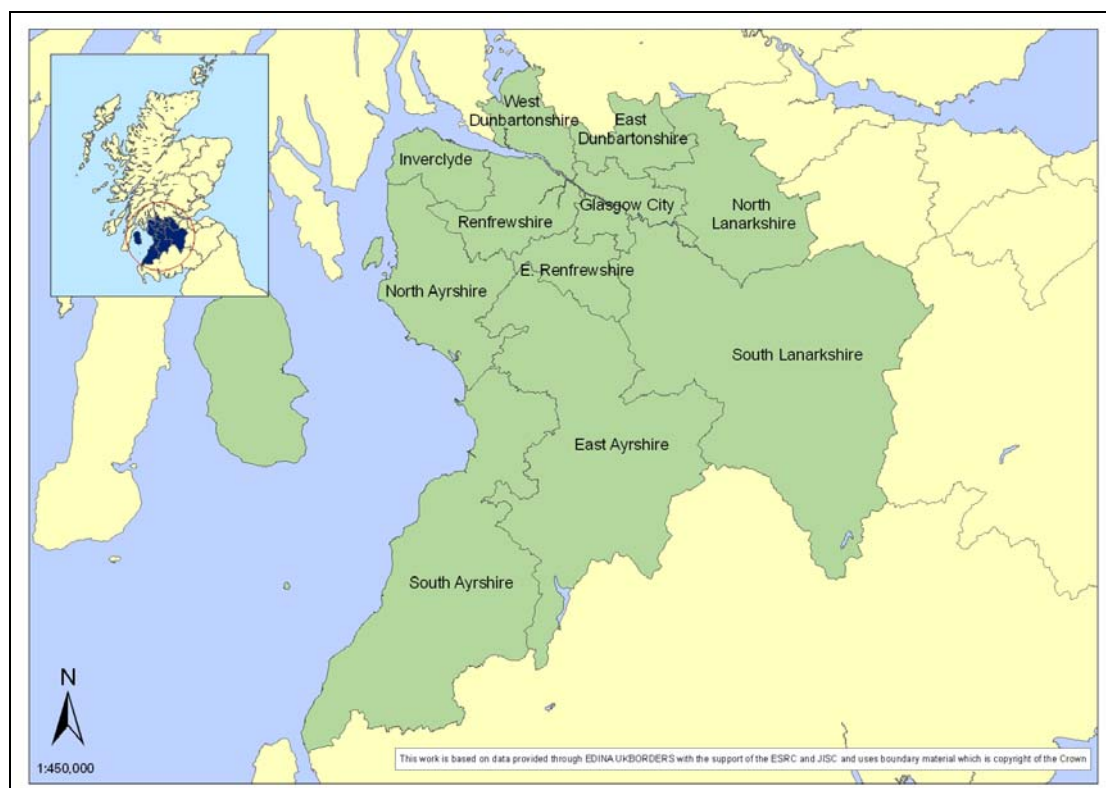
We define WCS as comprising eleven local authority areas: East Ayrshire, East Dunbartonshire, East Renfrewshire, Glasgow City, Inverclyde, North Ayrshire, North Lanarkshire, Renfrewshire, South Ayrshire, South Lanarkshire, and West Dunbartonshire. This is shown in Figure 3.1 below. However, a number of other geographies have been used to represent WCS. These are: Greater Glasgow & Clyde (the boundaries of the NHS Board area); Greater Glasgow (the boundaries of the old NHS board area before expansion in 2006^{xxii}); and Strathclyde (as defined by the boundaries of the old local government region^{xxiii}). In addition, and for comparison of a small number of indicators, the area of 'South West Scotland' has been used. This

^{xxii} The Greater Glasgow and Clyde Health Board area comprises six local authorities (East Dunbartonshire, East Renfrewshire, Glasgow City, Inverclyde, Renfrewshire and West Dunbartonshire) plus parts of North and South Lanarkshire. The former Greater Glasgow Health Board, which existed before 2006, covered Glasgow City, East Dunbartonshire and parts of West Dunbartonshire, East Renfrewshire, North and South Lanarkshire.

^{xxiii} The old Strathclyde region approximates to the above definition of WCS, but additionally includes Argyll & Bute.

is defined as the 'NUTS'^{xxiv} region used, for example, by Eurostat (the statistical arm of the European Commission). This region includes WCS, but also incorporates the more affluent (but less economically productive) Dumfries & Galloway area, and this is likely to impact to a degree on the rates presented^{xxv}. All these 'proxy' Scottish geographies are shown in Figure 3.2.

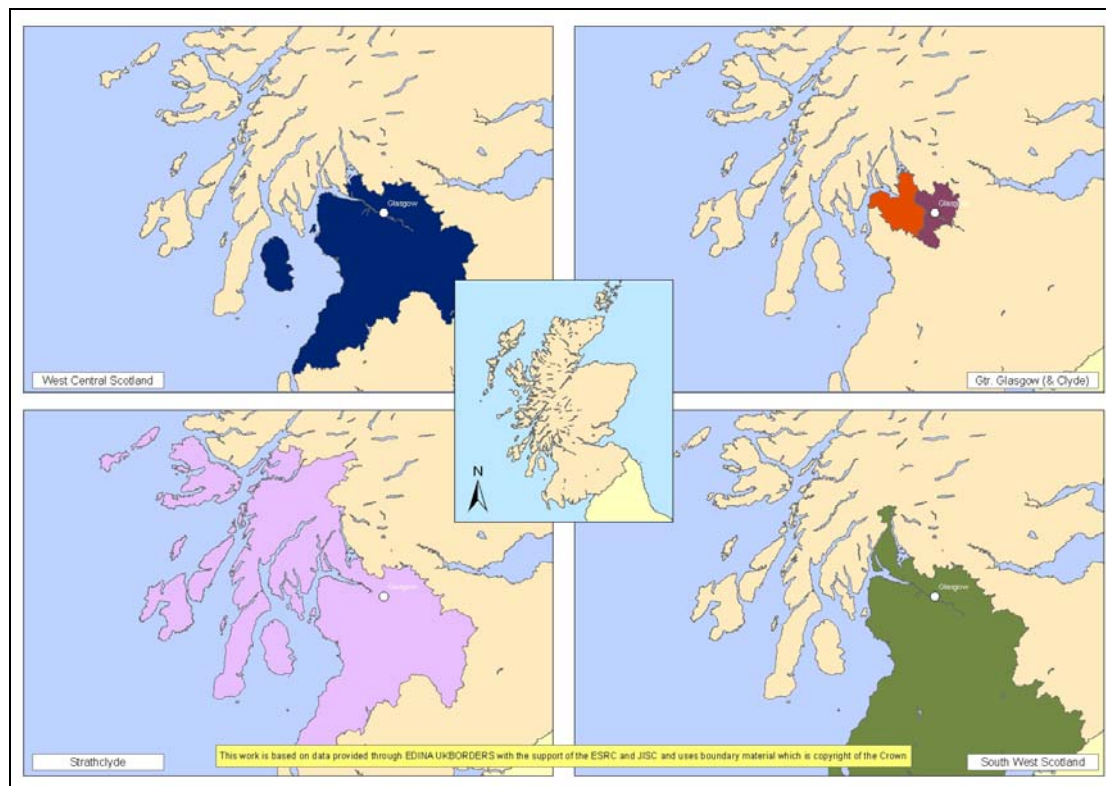
Figure 3.1: Map of West Central Scotland, defined by eleven local authority areas.



^{xxiv} NUTS stands for the 'Nomenclature of Territorial Units for Statistics' system and is the geographical system of national and sub-national geographies used by Eurostat. There are three main levels: NUTS1, with an average population size range of 3 to 7 million; NUTS2 (800,000 to 3 million); and NUTS3 (150,000 – 800,000).

^{xxv} South Western Scotland comprises the eleven local authorities used to define the West Central Scotland in the first 'Aftershock' report, plus Dumfries and Galloway and Argyll & Bute

Figure 3.2: Maps of West Central Scotland and the ‘proxy’ Scottish geographies



Maps in Figure 3.2 above – clockwise from top left: West Central Scotland (as used in the majority of analyses in this report; NHS Greater Glasgow & Clyde (whole shaded area), including the old Greater Glasgow NHS Board area (dark red portion); South West Scotland; Strathclyde region. Note that large parts of both S. W. Scotland and Strathclyde region are rural and much less densely populated than the ‘core’ WCS area.

Other ‘proxy’ geographies

Similar data limitations meant that for the presentation of some indicators for some regions it was necessary to use other proxy geographies. For example, North-Rhine Westphalia, North West England, and Wales/South East Wales are used on occasion in place of The Ruhr, Merseyside, Swansea & South Wales Coalfields respectively. These former are generally larger areas, less urbanised and less deprived than the ideal comparator regions at their core, meaning that their health outcomes and determinants might be expected to be more favourable. However, they still remain reasonable comparators for WCS.

Other proxies used very occasionally in the report include: West Wales & The Valleys (for Swansea & S. Wales Coalfields); Greater Merseyside (for Merseyside); and South Poland (encompassing Silesia and its neighbouring province, Malopolskie) for Silesia. Note that where a proxy geography has been used, it is highlighted below the relevant chart, and will often be also referred to in the text.

Silesia/Katowice

In the first 'Aftershock' report, the post-industrial region in Poland was referred to as 'Katowice'. This was one of the old provinces (voivodeships) of Poland. In 1999 it became part of the slightly larger province of Silesia (*Slaskie* in Polish). With one or two minor exceptions, the data presented in this report relate to Silesia, and this name is therefore used in preference to 'Katowice'.

Case studies

This report is accompanied by four separate case study reports. Some of the data from those reports are presented as illustrative examples of more in-depth analyses of the indicators or topics under discussion: for instance, in presenting unemployment rates across the twelve regions, we additionally show some of the more detailed analyses of unemployment rates *within* the regions of The Ruhr in Germany and Silesia in Poland.

The case studies frequently compare *sub-regional* level data for WCS with similarly sized sub-regions in the areas of interest. For WCS these 'sub-regions' are principally local authority areas or Community Health Partnership (CHPs) areas (the latter are very similar to local authorities, but enable Glasgow City to be broken down into five sub-city sections^{xxvi}). In the other regions we use a range of similar smaller districts. For example: Czech *okresy* (Northern Moravia); Polish *powiats* (Silesia/Katowice); German *kreise* (The

^{xxvi} Note that at the start of this project, there were five Community Health Partnerships in Glasgow City (actually referred to as Community Health and Care Partnerships (CH(C)Ps), although in this report we use the generic CHP abbreviation used elsewhere in WCS). However, in 2010 the boundaries of the Glasgow areas were redrawn, with the number of CHP areas reduced to three. This report presents data based on the old (five) boundaries.

Ruhr); French *arrondissements* (Nord-Pas-de-Calais). Please note that comparisons of population sizes across the sub-regions are shown within the individual case study reports.

Case study examples from the Ruhr and from Northern Moravia cite data from two particular population surveys. For the Ruhr area, this is the Heinz Nixdorf Recall Study (HNR)^{xxvii, 33} which collected data from a representative sample of 4,800 men and women aged 45-74 in the three cities of Mulheim, Bochum & Essen between 2000 and 2003. For Northern Moravia, data from the HAPIEE study^{xxviii,34} are used. This is a cohort study of over 35,000 individuals aged 45-69 living in Eastern Europe, and includes two major towns within the Moravskoslezský part of Northern Moravia (Havírov and Karviná), with representative data from around 1,600 residents collected. In both cases we compare these survey data with similar Scottish data for identical age groups.

Format of charts

Note that in all the charts presented, WCS (or any equivalent Scottish area), and any sub-regions of WCS, are shown in blue. Data from the case studies follow a similar schema: areas within Northern Moravia are shown in green; areas within the Ruhr are yellow; areas within Silesia are orange; and areas within Nord-Pas-de-Calais are shaded red.

Where survey data are presented, we have tried to include 95% confidence intervals to indicate whether or not differences between regions can be considered statistically significant. However, it was not always possible to do this for all survey measures and for all regions.

Full definitions of all data presented in the report are included in Appendix A.

^{xxvii} The Heinz Nixdorf Recall (Risk Factors, Evaluation of Coronary Calcification, and Lifestyle) Study was initiated in 2000 with a particular remit to investigate risk and protective factors related to cardiovascular disease in the urban populations of Bochum, Essen and Mülheim an der Ruhr. More information about the study can be found at: <http://www.uk-essen.de/recall-studie/?L=1>.

^{xxviii} See <http://www.ucl.ac.uk/easteurope/hapiee.html> for more details of the HAPIEE study.

3.2 Health and function - a further analysis of health outcomes in the regions

Introduction

Population health outcomes can be measured by both *objective* indicators of ill-health (such as mortality rates and GP-diagnosed illness), and by *subjective* indicators (for example, by asking how individuals feel about their own health and well-being). Both types of measures can be useful in describing health status at a population level.

This section looks briefly at a selection of health outcomes across the twelve relevant regions. The outcomes include: life expectancy and all-cause mortality (in both cases analysed at the *sub-regional* level); three measures of self-assessed health and well-being (general health, long-term limiting illness, and life satisfaction); and some self-reported morbidity data. As with all other sections in the report, the analyses are illustrated with examples from the case studies.

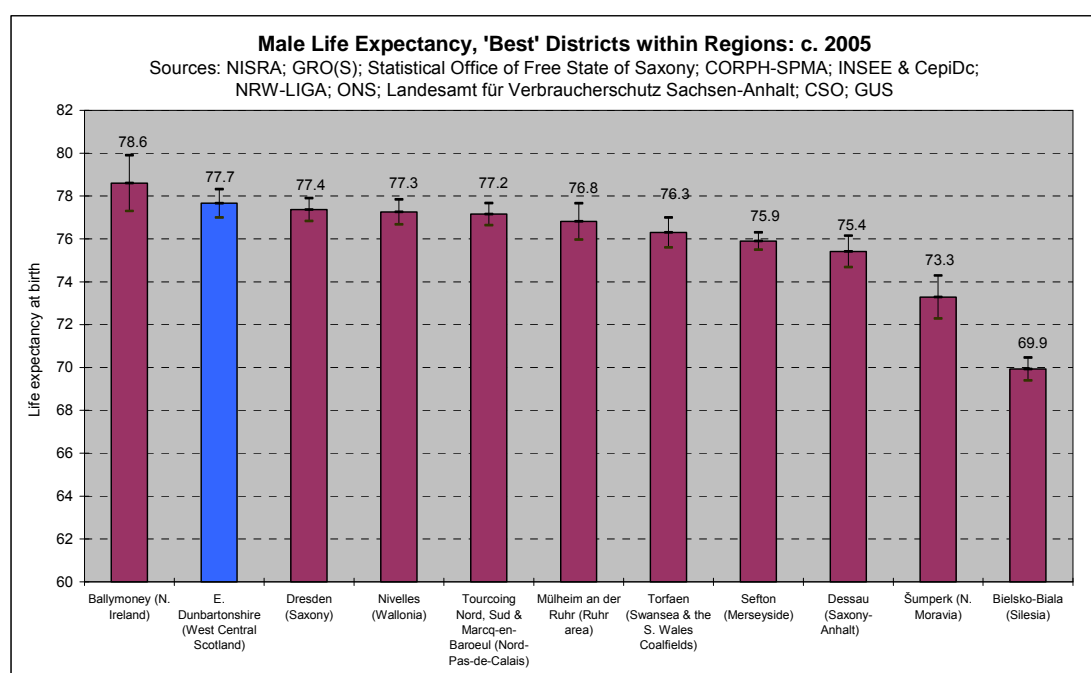
Sub-regional mortality

Mortality rates have been improving at a slower rate in West Central Scotland (WCS) than in other, comparable post-industrial regions. A key question is whether these differences are driven by the very high mortality in certain sub-regions (especially Glasgow City) or whether there is a more widespread geographic effect. One of the main challenges in addressing this issue is that the districts within each of the post-industrial regions of interest vary widely in size, from less than 30,000 people in the Northern Ireland district of Ballymoney to more than 500,000 in the cities of Dresden and Glasgow. Nevertheless, it is still useful to compare the best and worst areas in each region^{xxix} to establish whether this provides any insight into geographical variations.

^{xxix} Note, however, that due to issues of data availability, Limburg is excluded from this analysis.

Taking 2005 as the reference year, the WCS district (local authority) with the highest male life expectancy was East Dunbartonshire. Figure 3.3 shows that life expectancy in this relatively prosperous part of WCS compares favourably with the ‘best’ districts located within West European post-industrial regions, and indeed is significantly higher than that observed in the ‘best’ districts within Merseyside in England, Saxony-Anhalt in Germany, Northern Moravia in the Czech Republic and Silesia and Poland.

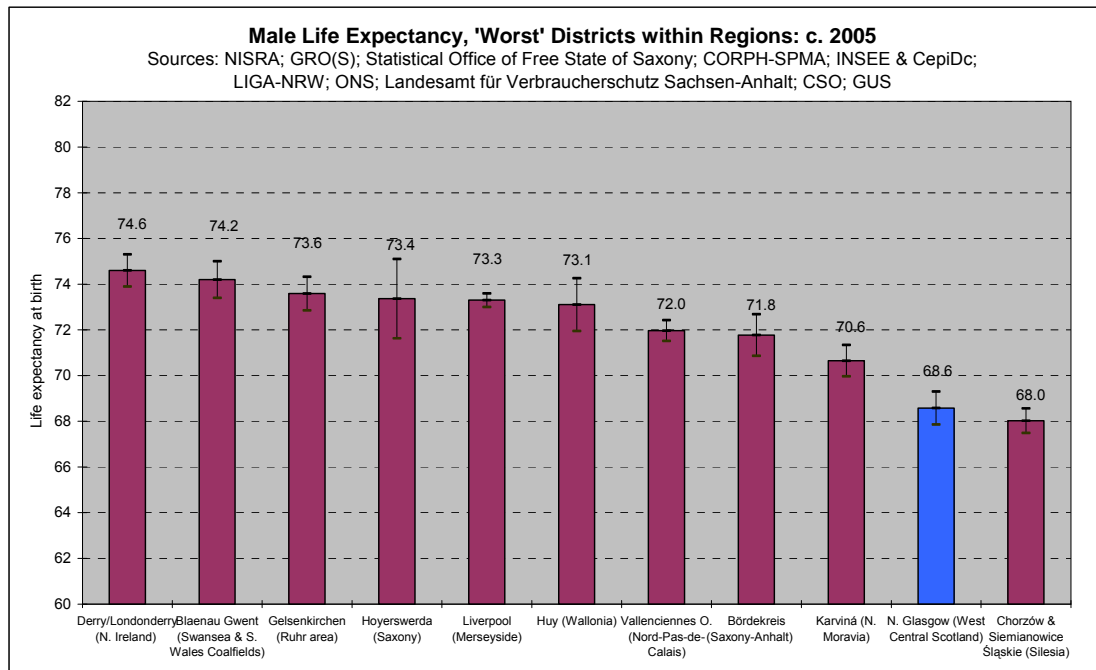
Figure 3.3



Populations: Ballymoney=29,000, E. Dunbartonshire=106,000, Dresden=495,000, Nivelles=365,000, Tourcoing Nord, Sud & Marcq-en-Baroeul=117,000 (2006), Mülheim an der Ruhr=170,000, Torfaen=91,000, Sefton=278,000, Dessau=92,000, Šumperk=125,000, Bielsko-Biala=177,000.

In contrast, male life expectancy in North Glasgow – the WCS ‘district’ with the lowest male life expectancy – is lower than almost every one of the other ‘worst’ post-industrial districts, and is comparable to that of the ‘worst’ Silesian district (Figure 3.4).

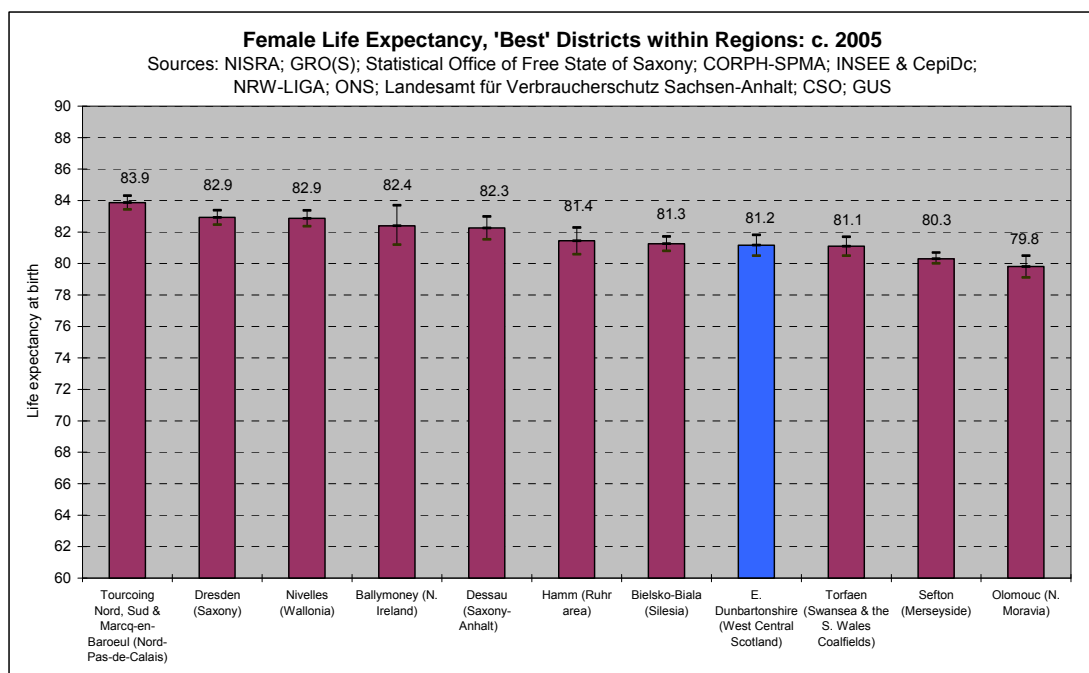
Figure 3.4



Populations: Derry/Londonderry=107,000, Blaenau Gwent=69,000, Gelsenkirchen=268,000, Hoyerswerda=43,000, Liverpool=443,000, Huy=104,000, Vallenciennes O.=140,000 (2006), Bördekreis=190,000, Karviná=277,000, N. Glasgow=100,000, Chorzów & Siemianowice Śląskie=187,000.

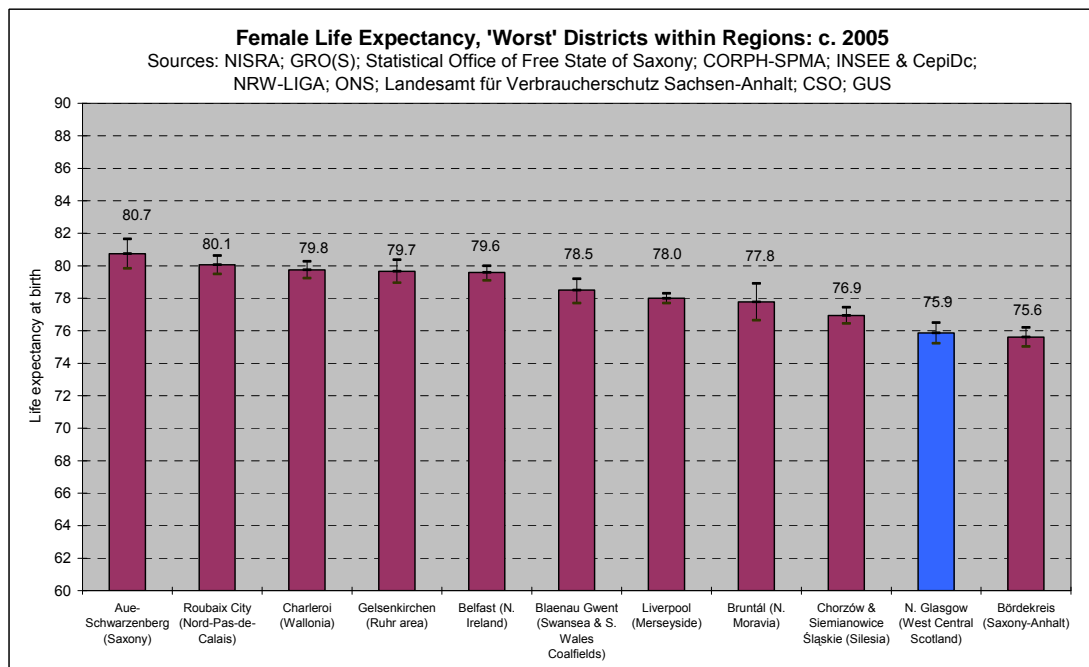
Female life expectancy in the 'best' WCS district (also East Dunbartonshire) compares less favourably. It is towards the bottom end of the distribution for the 'best' post-industrial districts and significantly higher than only two districts: Sefton in Merseyside and Olomouc in Northern Moravia (Figure 3.5). Female life expectancy in the 'worst' WCS district (North Glasgow) was lower than almost every one of the worst post-industrial districts and comparable to Bördekreis in Saxony-Anhalt (Figure 3.6).

Figure 3.5



Populations: Tourcoing Nord, Sud & Marcq-en-Baroeul=117,000, Dresden=495,000, Nivelles=365,000, Ballymoney=29,000, Dessau=92,000, Hamm=184,000, Bielsko-Biala=177,000, E. Dunbartonshire=106,000, Torfaen=91,000, Sefton=278,000, Olomouc=222,000. All 2005 except Tourcoing Nord, Sud & Marcq-en-Baroeul (2006).

Figure 3.6



Populations: Aue-Schwarzenberg=95,000, Roubaix City=98,000, Gelsenkirchen=268,000, Belfast=268,000, Blaenau Gwent=69,000, Liverpool=443,000, Bruntál=99,000, Chorzów & Siemianowice Śląskie=187,000, N. Glasgow=100,000, Bördekreis=190,000. All 2005 except Roubaix City (2006).

Although crude and limited in scope, this simple analysis suggests that for men, life expectancy is geographically polarised in WCS: East Dunbartonshire's life expectancy can compete with the best districts in post-industrial Western Europe but North Glasgow's life expectancy is comparable to the very *worst* districts of Eastern Europe. For women, the WCS district with the highest life expectancy is mid-ranked relative to the other 'best' post-industrial districts, while female life expectancy in the worst WCS district is again comparable to the very worst districts of Eastern Europe.

This suggestion of potentially wider inequalities in mortality in WCS is strengthened by the results of recent national analyses which have shown that inequalities in mortality in Scotland as a whole are greater than in the majority of Western European countries, including Germany, France, Belgium, Netherlands, Northern Ireland and England & Wales³⁵.



CASE STUDY – NORD-PAS-DE-CALAIS: Sub-regional mortality

It is possible to illustrate differences in sub-regional mortality in more detail using an example from the Nord-Pas-de-Calais case study. Figures 3.7 (males) and 3.8 (females) compare all-cause mortality rates for the 15 WCS Community Health Partnerships (CHPs) with those for the districts/part-districts of Nord-Pas-de-Calais^{xxx}. As noted in the preface to these chapters (and outlined in more detail in the case study report), the two sets of sub-regions were of comparable population size.

In 2002-06, the higher rates of all-cause *male* mortality in WCS appear to have been particularly driven by rates in the five Glasgow CHP areas (Figure 3.7). In contrast, Figure 3.8 shows that female mortality was higher in the vast majority of the WCS CHP areas compared to the similarly sized French districts.

Figure 3.7

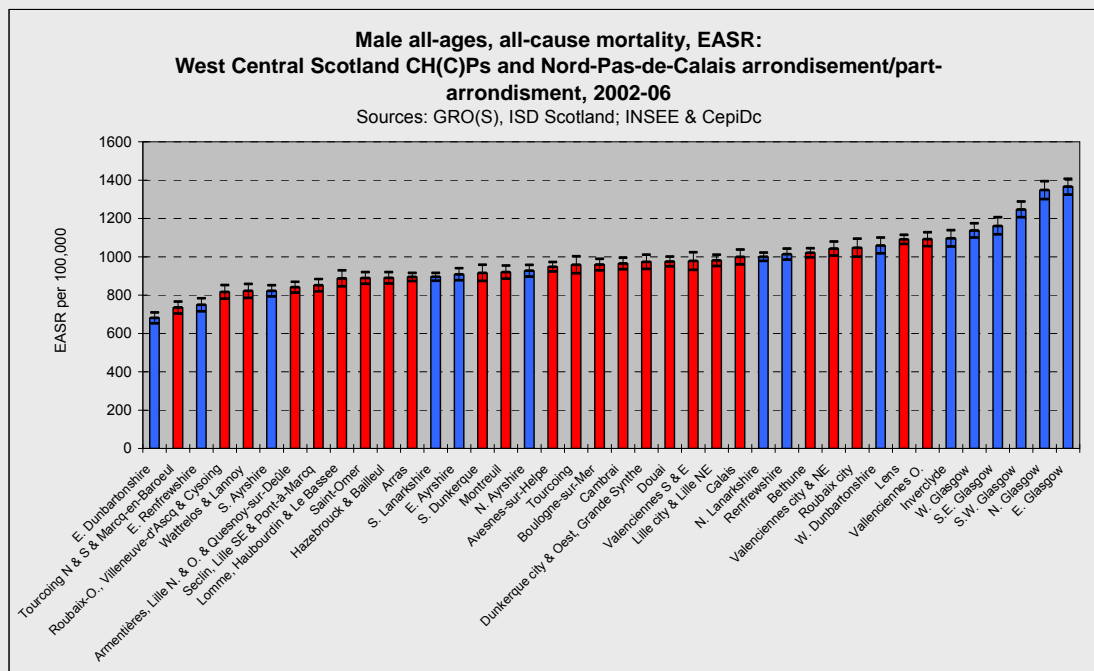
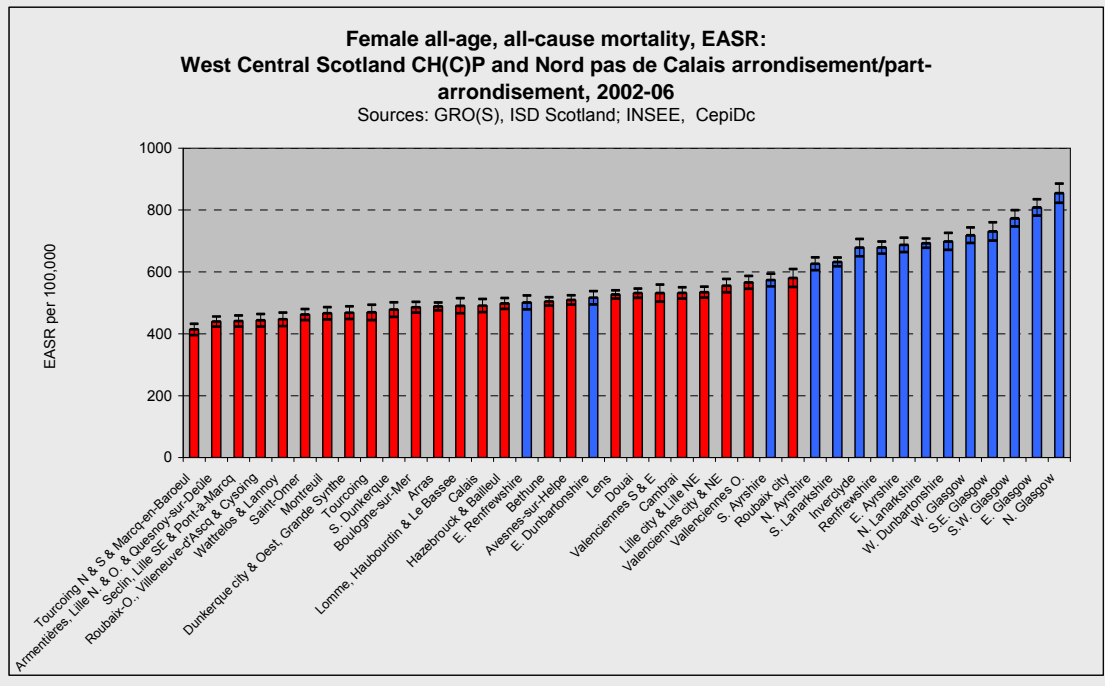


Figure 3.8



Self-reported measures of health and well-being

In this section we look at comparisons of self-reported general health, limiting long-term illness and levels of life satisfaction.

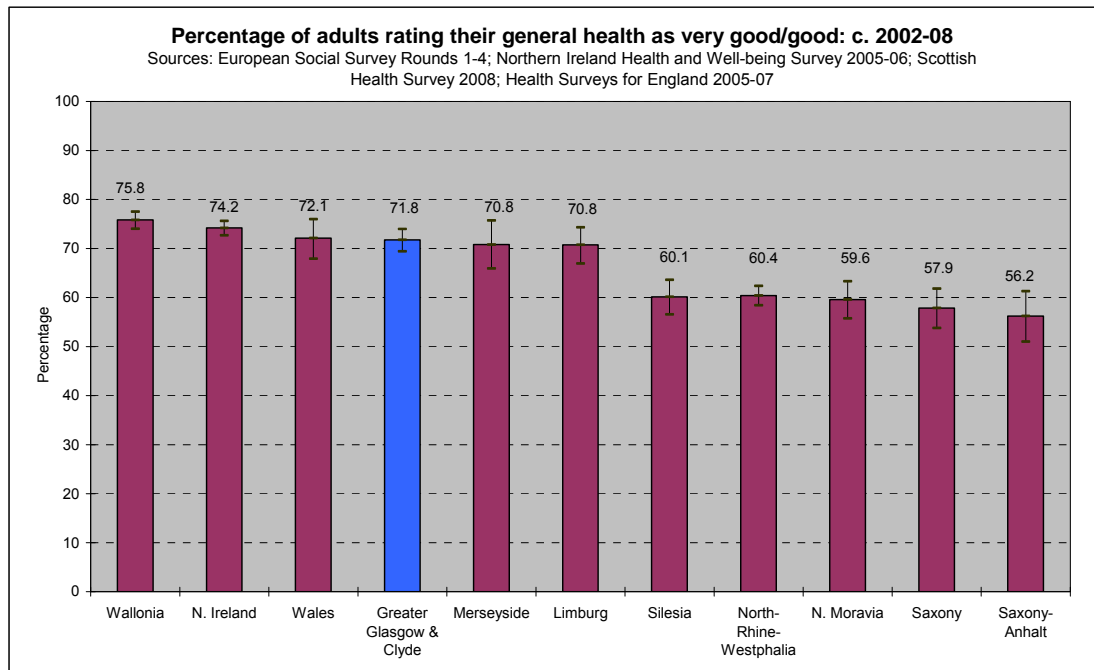
A large number of studies have found self-rated health to be a good predictor of subsequent mortality^{36, 37}. At the same time, however, other analyses have pointed to important demographic, socio-economic and cultural factors which can affect such measures³⁸. For example, Mitchell suggested that: *“the Scots are more likely not to report how sick they really are, and the Welsh to report higher rates of sickness, but to live longer”*³⁹. Similarly, another study found that self-rated health in Scotland was better than might be expected compared to England and Wales, given the excess mortality. The authors concluded that this might reflect *“variations in pre-death health status in different parts of the UK or differences in the thresholds at which people in different parts of the UK report not having good health, or a combination of both”*.³⁷ It is, therefore, important to bear these caveats in mind when examining cross-country comparisons of these measures, as these are likely to be prone to the influence of different cultural factors.

General health

The measure shown here (derived from a number of different population surveys) is based on how people rate their health in general over the last 12 months (with a choice of: very good, good, fair, bad or very bad). Comparisons shown use the percentage of adults rating their health as ‘good’ or ‘very good’ in each region. Note that we employ the Greater Glasgow & Clyde (GGC) region as a proxy for WCS.

In 2008, over two-thirds of adults in GGC (71.8%) rated their general health as good or very good. This proportion was very similar to levels reported in the other UK regions, and in Wallonia (in Belgium) and Limburg (Netherlands). It was significantly higher than levels reported in the German and East European regions, where the percentage of adults rating their general health as good/very good fell to 60% or below (Figure 3.9).

Figure 3.9



Sample sizes: Wallonia=2317, N. Ireland=4242, Wales=463, Greater Glasgow & Clyde=1170, Merseyside=742, Limburg=574, North-Rhine-Westphalia=1869, Silesia=770, N. Moravia=608, Saxony=1051, Saxony-Anhalt=641. Nord-Pas-de-Calais results not shown as ESS French sample not representative at regional level. Note: Wales used as proxy for Swansea & S. Wales Coalfields; North-Rhine-Westphalia used as proxy for the Ruhr area.

The fact that the figure for GGC is significantly *higher* than places like Saxony, Saxony-Anhalt and North-Rhine-Westphalia (used here as a proxy for the Ruhr) is notable because in fact these regions have significantly lower mortality than WCS. This, therefore, is likely to reflect the cultural differences in self-assessment of health referred to above.

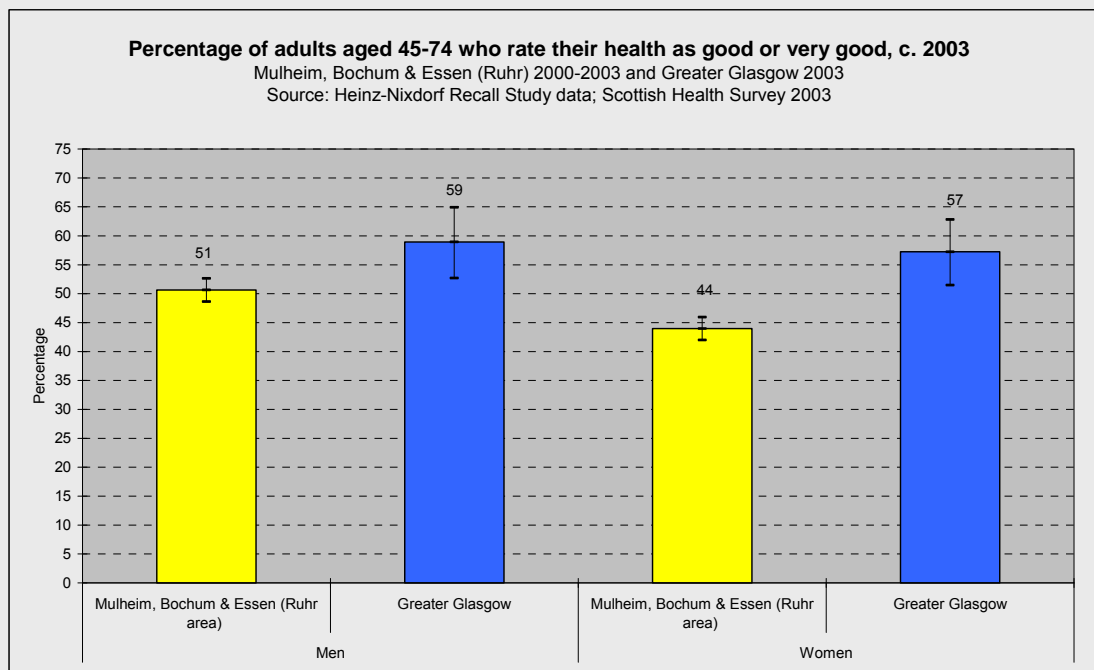


CASE STUDY – THE RUHR: Self-assessed health

An illustrative example is available from the case study of the Ruhr area in Germany. Data for the area are derived from the Heinz-Nixdorf Recall Study (HNR), which – as mentioned in Section 3.1 (and in more detail in the case study report) – interviewed 4,814 men and women aged 45-74 in the three Ruhr cities of Mulheim, Bochum & Essen between 2000 and 2003. WCS data for the same age group come from the Greater Glasgow sample of the 2003 Scottish Health Survey. Note that the sample size is considerably smaller than that of the German study.

As Figure 3.10 shows, based on these data adults aged 45-74 in Greater Glasgow were significantly more likely to report that their health was good compared to their peers in the three Ruhr cities. This is consistent with the results shown in Figure 3.9 above comparing Greater Glasgow & Clyde with the German state of North-Rhine-Westphalia.

Figure 3.10

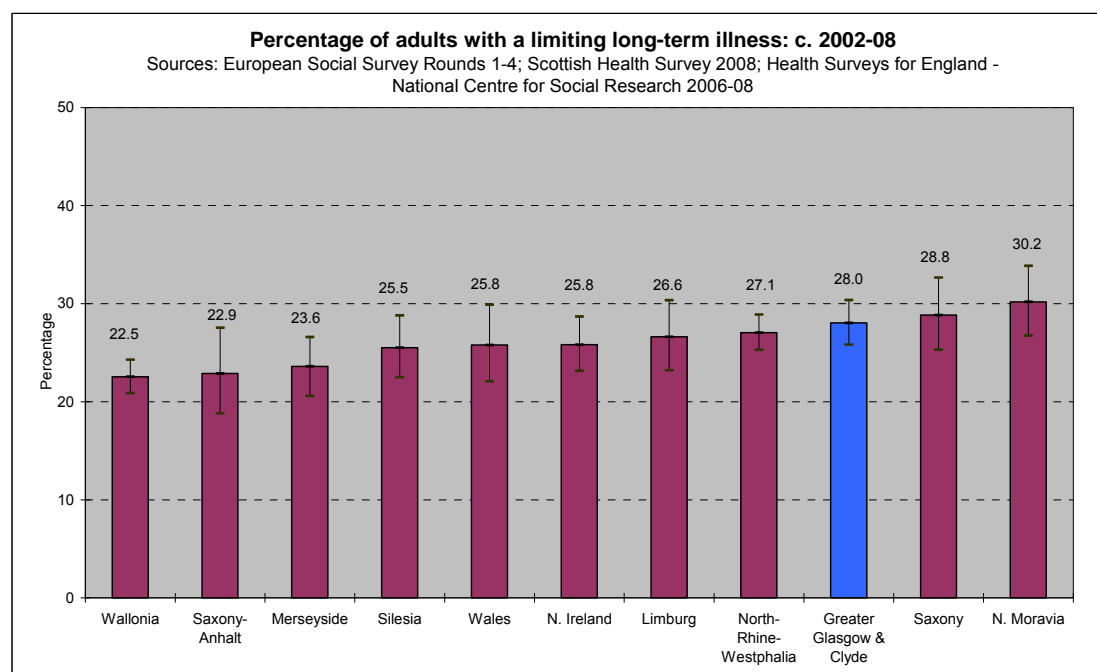


Sample sizes: HNRs 2000-2003 (3 cities) – 2385 men and 2416 women; Scottish Health Survey 2003 (Greater Glasgow) – 242 men and 318 women.

Long-term limiting illness or disability

In 2008 more than a quarter (28.0%) of adults in Greater and Glasgow and Clyde (used here again as a proxy for WCS) reported that they had a long-term illness or disability that limited their daily activities in some way. Figure 3.11 shows that while this was towards the upper end of the spectrum for the regions compared, it was not significantly different from the figure observed in many of the other regions, including areas as diverse as Saxony-Anhalt and Limburg.

Figure 3.11



Sample sizes: Wallonia=2,317, Saxony-Anhalt=641, Merseyside=956, Silesia=767, Wales=463, N. Ireland=964, Limburg=574, North-Rhine-Westphalia=1866, Greater Glasgow & Clyde=1,170, Saxony=1049, N. Moravia=608. Nord-Pas-de-Calais results not shown as ESS French sample not representative at regional level. Wales used as proxy for Swansea & S. Wales Coalfields; North-Rhine-Westphalia used as proxy for the Ruhr area.

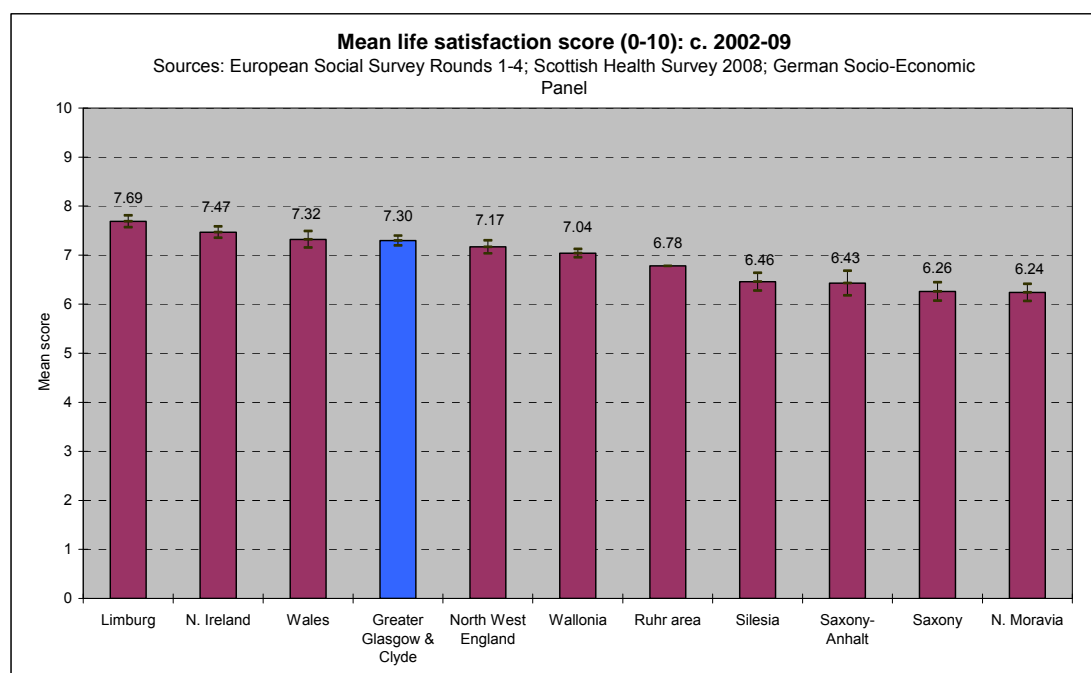
Life satisfaction

The third indicator of self-assessed health and function considered here is life satisfaction. Studies in Finland have found that dissatisfaction with life is associated with increased male mortality, even after adjusting for health behaviours, marital status and social class⁴⁰.

The measure used asked people to rate how satisfied they were with their life as a whole nowadays, on an eleven-point scale from 0-10, with 10 representing complete satisfaction and zero complete dissatisfaction. Mean scores are shown for each regional adult population.

In 2008, the mean life satisfaction score for Greater Glasgow & Clyde was 7.3, similar to levels of life satisfaction found in other parts of post-industrial Britain. As seen with general health, the lowest levels of life satisfaction were observed in the German regions (both East and West), Silesia in Poland and Northern Moravia in the Czech Republic. This is all shown in Figure 3.12 below.

Figure 3.12



Sample sizes: Limburg=574, N. Ireland=956, Wales=462, Greater Glasgow & Clyde=1169, North West England=910, Wallonia=2,307, Ruhr area=1,195, Silesia=765, Saxony-Anhalt=641, Saxony=1052, N. Moravia=604. Nord-Pas-de-Calais results not shown as ESS French sample not representative at regional level. Wales used as proxy for Swansea & S. Wales Coalfields; North West England used as proxy for Merseyside. 95% confidence intervals not available for The Ruhr.

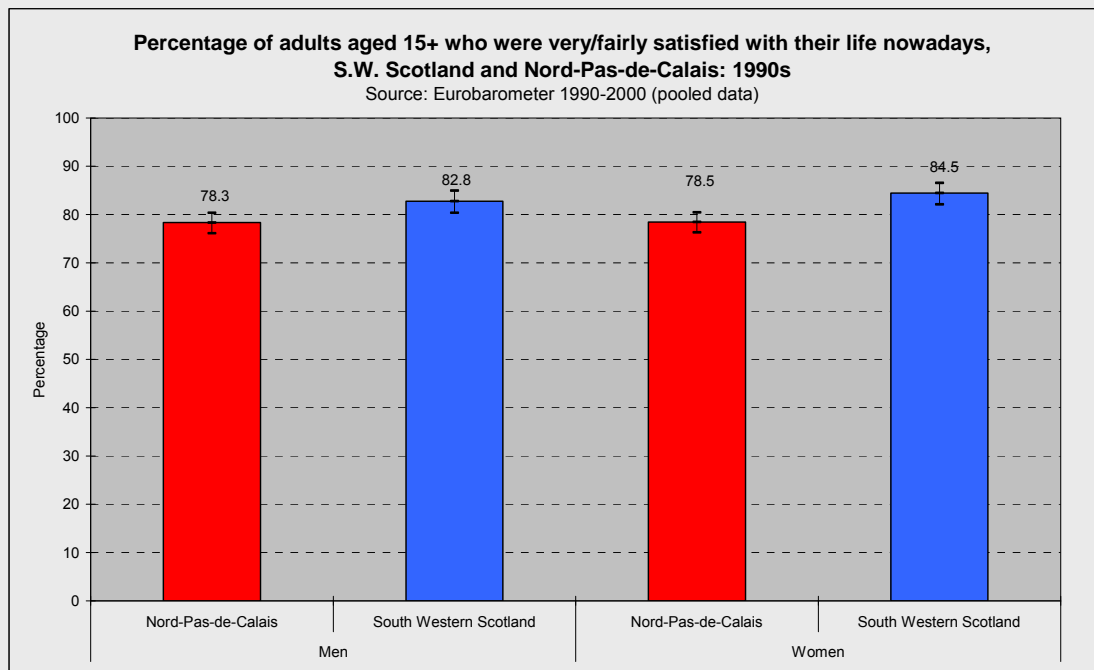


CASE STUDY – NORD-PAS-DE-CALAIS: life satisfaction

Since the European Social Survey (ESS) – the source of the majority of the data presented in Figure 3.12 above – was not designed to produce representative results for Nord-Pas-de-Calais, we cannot use that source to compare life satisfaction in the French region with WCS. It is, however, possible to use an alternative source, the Eurobarometer survey, to compare life satisfaction in South Western Scotland^{xxx} and Nord-Pas-de-Calais. Note that the measure used is less fine-grained than that in the ESS, asking people to rate how satisfied they were with their life nowadays on a four-point scale, from very satisfied to not at all satisfied.

In the Scottish region, 82.3% of men reported they were very/fairly satisfied with their life nowadays. This was significantly, but not substantially, higher than the figure of 78.3% reported for Nord-Pas-de-Calais. Women in South Western Scotland were also more likely to report they were satisfied with life compared to those in Nord-Pas-de-Calais, with 84.5% reporting they were very/fairly satisfied with their life nowadays compared to 78.5% in the French region (Figure 3.13).

Figure 3.13



Sample sizes: NPdC=707 men and 733 women. South Western Scotland=471 men and 473 women.

^{xxx} As outlined in the preface to these chapters, South Western Scotland comprises the eleven local authorities used to define West Central Scotland in the first 'Aftershock' report, plus Dumfries and Galloway and Argyll & Bute.

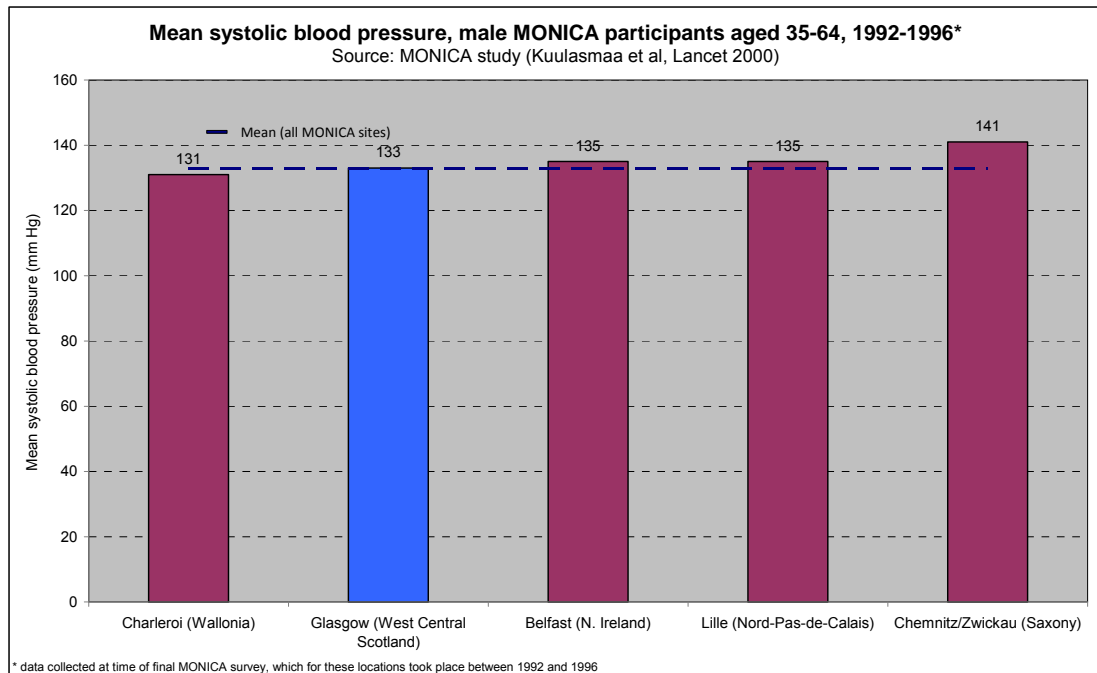
Morbidity & biological markers of health

A lack of comparable data prevents a detailed analysis of levels of morbidity across the regions. However, an insight into the likely prevalence of certain diseases has already been provided through the analyses of a range of causes of death presented in the first 'Aftershock' report. In addition, some limited proxy data relating to important biological markers of disease (cholesterol and blood pressure) are shown here, as well as data relating to diabetes prevalence from one of the case studies.

Figure 3.14 below shows mean systolic blood pressure measurements taken from male participants in the MONICA study in the early to mid-1990s^{xxxii},⁴¹. The MONICA study allows us to compare measurements for large samples of the population of Glasgow (as a proxy for WCS) with cities in the regions of Wallonia (Charleroi), Northern Ireland (Belfast), Nord-Pas-de-Calais (Lille) and Saxony (Chemnitz and Zwickau). Markers of disease in the 1990s will clearly impact on mortality rates at a later date. As Figure 3.14 shows, average blood pressure readings among Glasgow participants were on a par with those taken at all the MONICA sites – and were very much lower than those recorded in the sites in Saxony. The situation is similar for females (data not shown).

^{xxxii} MONICA (Multinational **MON**itoring of trends and determinants in **CA**rdiovascular disease) was established in the early 1980s in many Centres around the world to monitor trends in cardiovascular diseases, and to relate these to risk factor changes in the population over a ten year period. More information is available at: <http://www.ktl.fi/monica/index.html>.

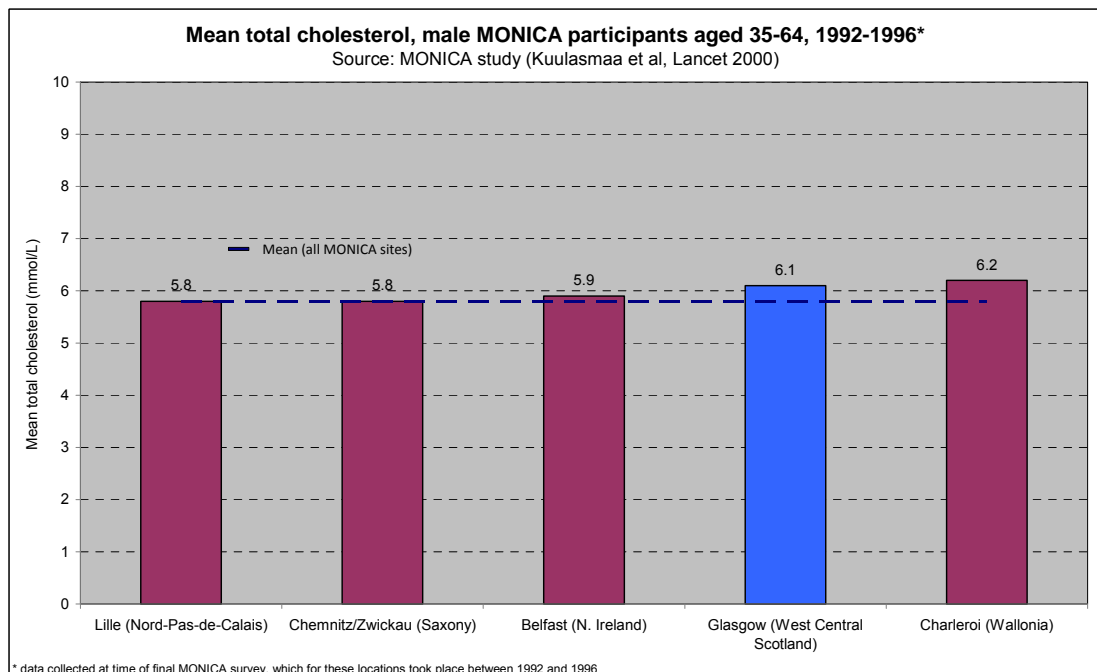
Figure 3.14



Sample sizes: Charleroi=747; Glasgow=1612; Belfast=2594; Lille=1126; Chemnitz/Zwickau=1115.

Figure 3.15 below shows similar data from the MONICA study in relation to levels of total cholesterol, where levels in Glasgow were comparatively high. Data for females (not shown) were again similar.

Figure 3.15



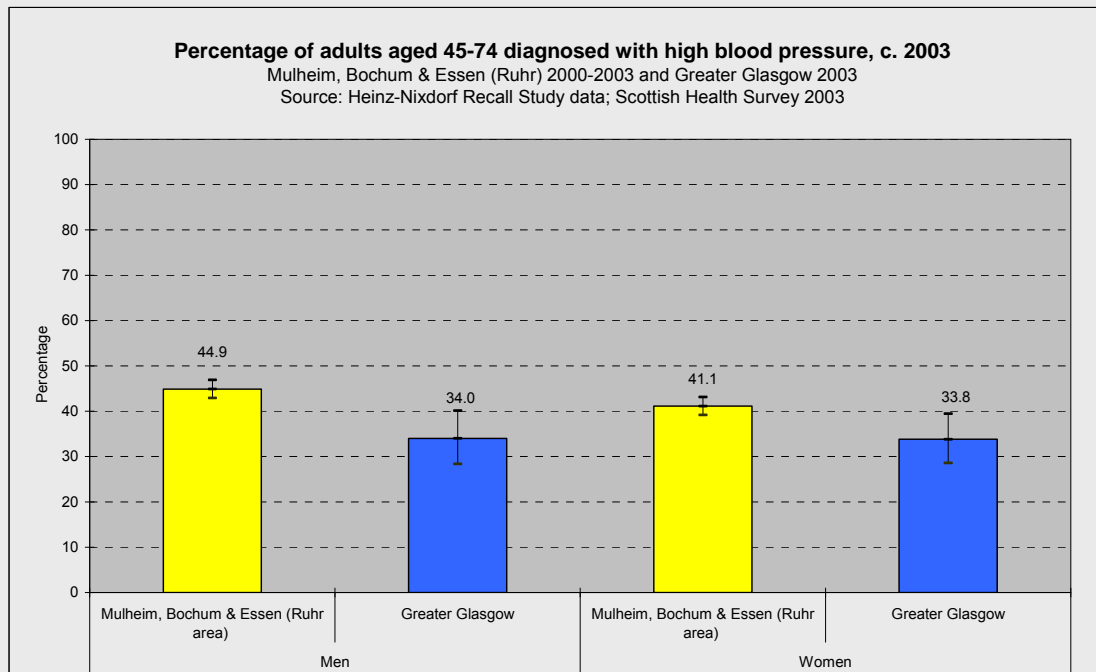
Sample sizes: Charleroi=747; Glasgow=1612; Belfast=2594; Lille=1126; Chemnitz/Zwickau=1115.



CASE STUDY – THE RUHR: high blood pressure

The relatively low levels of blood pressure seen among WCS MONICA participants is echoed by regional comparisons between Greater Glasgow (as a proxy for WCS) and relevant cities within the Ruhr area of Germany. Data for the latter are again derived from the HNR study, while WCS data again come from the Greater Glasgow sample of the 2003 Scottish Health Survey. As Figure 3.16 below shows, prevalence of doctor-diagnosed high blood pressure was significantly lower in the Scottish region compared to the Ruhr cities included in the German HNR study.

Figure 3.16



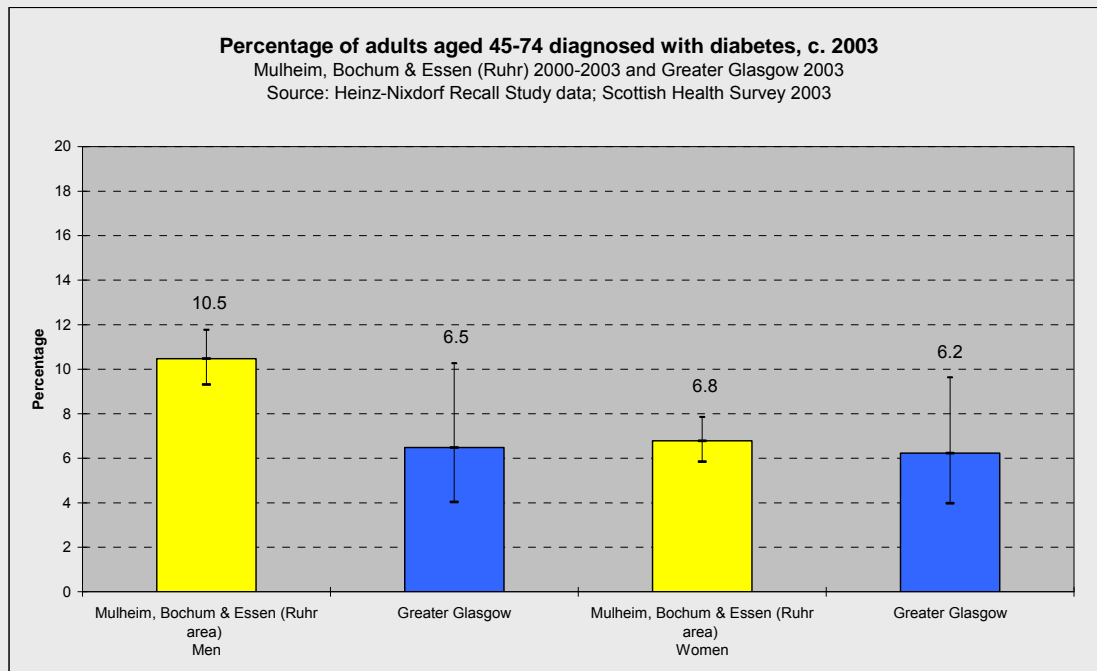
Samples sizes= HNRS 2000-2003 (3 cities) – 2,372 men and 2,407 women, Scottish Health Survey 2003 (Greater Glasgow) – 242 men and 316 women.



CASE STUDY – THE RUHR: diabetes

The same data sources were used to compare prevalence of diabetes in WCS (Greater Glasgow) and the Ruhr (cities of Mulheim, Bochum & Essen). As Figure 3.17 shows, prevalence of doctor-diagnosed diabetes was not significantly different in the two regions.

Figure 3.17



Sample sizes= HNRS 2000-2003 (3 cities) –2395 men and 2419 women, Scottish Health Survey 2003 (Greater Glasgow) –242 men and 318 women.

Summary: Health and function

- Male **life expectancy** in the 'best' West Central Scotland (WCS) district is high compared to the other 'best' districts of post-industrial European regions. Female life expectancy in the 'best' WCS district is mid-ranked relative to the 'best' post-industrial districts.
- For both sexes, life expectancy in the 'worst' WCS district (North Glasgow) is among the lowest in post-industrial Europe – similar, in fact, to life expectancy in the worst districts of Silesia in Poland and Northern Moravia in the Czech Republic.
- Reported levels of **life satisfaction** and subjective general health in WCS were comparable to those in other UK post-industrial regions and significantly higher than those observed in German and East European regions.
- Subjective assessments of **mental and emotional health** in Greater Glasgow are either no different from, or compare favourably with, those reported for Nord-Pas-de-Calais.
- While levels of reported **long-term limiting illness** are high in Greater Glasgow & Clyde, they are not significantly different from those observed in many other post-industrial regions.

3.3 Prosperity and poverty

Introduction

The link between income and health is well known^{42, 43, 44, 45}. Indeed, income levels and other broader aspects of socio-economic deprivation, have been cited as the main reason for Scotland's, and particularly West Central Scotland's (WCS), poor health status of recent times. With this in mind, one of the overarching aims of this study is to determine whether this poorer health status can indeed be explained purely in terms of socio-economic factors, or whether other explanations are required.

In the first '*Aftershock*' report, some basic data were presented comparing prosperity in WCS to other post-industrial regions. In this chapter, the analyses are extended to include a wider selection of indicators (to investigate whether this conclusion holds true when prosperity is examined using a broad mix of subjective and objective measures), and to examine trends over time (to see whether past levels of prosperity were lower in WCS). In addition, we draw on some examples from the case studies to analyse the data at the sub-regional level.

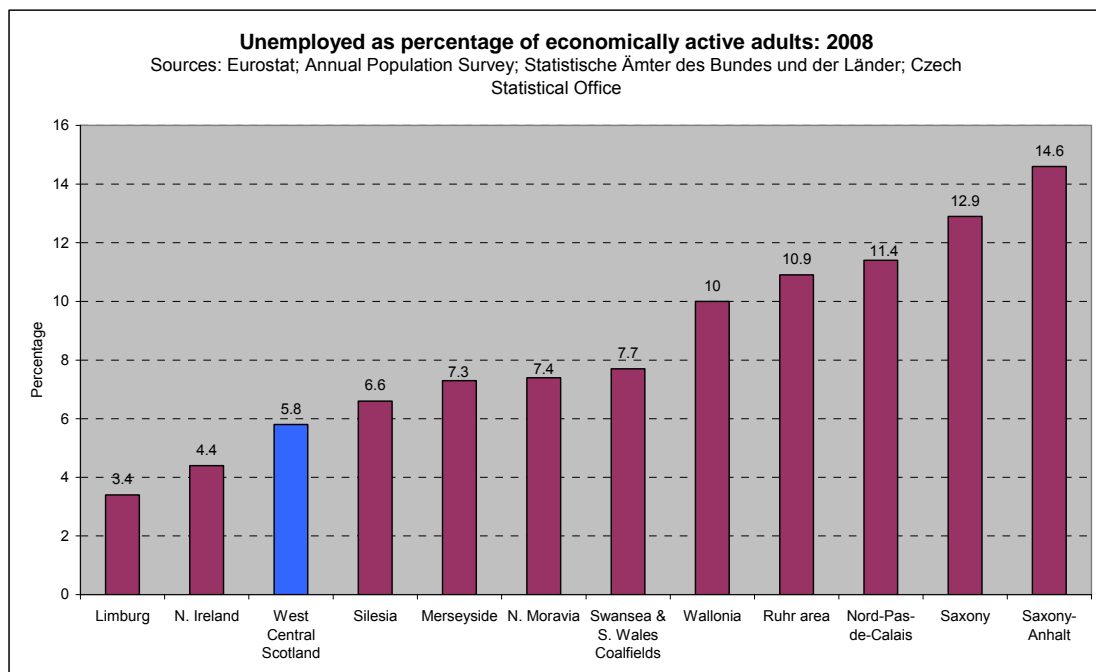
Note that in the subsequent chapter (3.4) we look separately at measures of income inequality and relative poverty.

Unemployment

Since much of the excess mortality in WCS occurs among working-age people^{7, 8, 15}, it is useful to examine the extent to which any differences in labour market status can account for this. The first measure used is the unemployment rate, defined as the percentage of economically active adults available for and looking for work. The association between unemployment and poorer physical and mental health is well established;⁴⁶ but can it adequately 'explain' relative trends in mortality in WCS?

Figure 3.18 presents regional unemployment rates in 2008. At 5.8%, the unemployment rate in WCS was low compared to the majority of the other regions. Between 2005 and 2008, there were dramatic falls in unemployment in Silesia and Northern Moravia, so that their position improved relative to WCS. Nonetheless, the basic conclusion from the first 'Aftershock' report still holds true: that unemployment rates in WCS compare favourably with many other regions, especially Wallonia, Nord-Pas-de-Calais, the Ruhr, Saxony and Saxony-Anhalt.

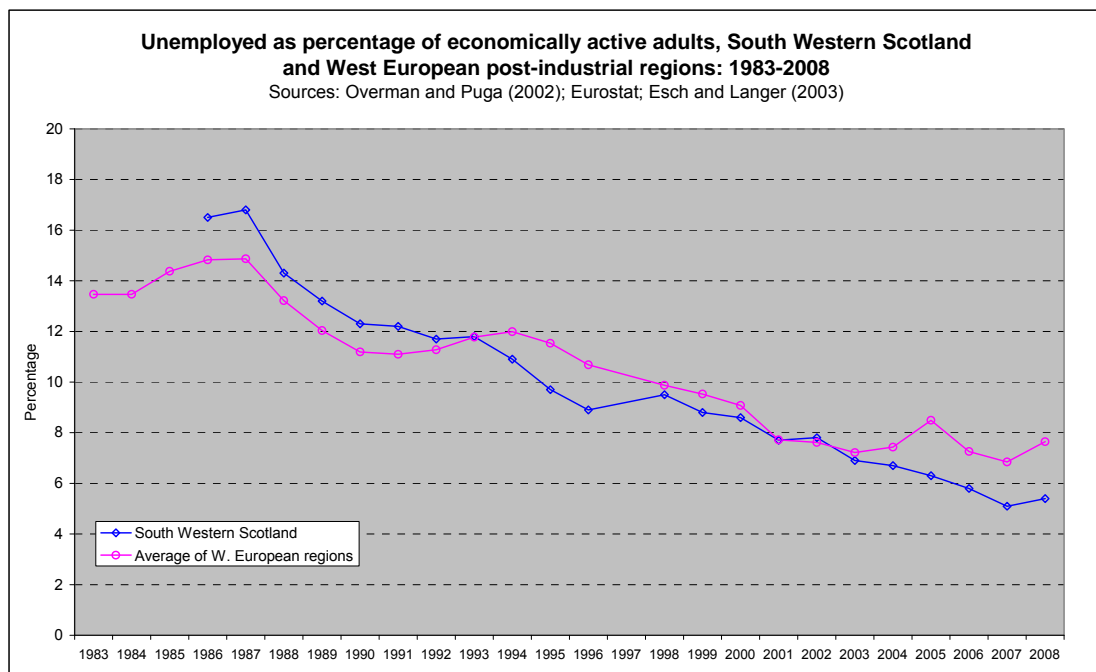
Figure 3.18



It is also possible to examine trends in unemployment over time (using South Western Scotland was used as a proxy for WCS). Note that comparisons with average unemployment rates in the West and East European regions are shown separately, due to the difference in timing of deindustrialisation in these parts of Europe and the impact of Communist full employment policies in Eastern European states in the earlier part of period.

Figure 3.19 shows that for much of the 1980s, levels of unemployment in South Western Scotland were slightly higher than the other West European post-industrial regions. In 1986 only Merseyside and Northern Ireland had higher unemployment rates^{xxxiii}. However, by the mid-1990s unemployment rates in South Western Scotland had fallen below the average of the other Western European regions. Since around 2000, South Western Scotland's unemployment rate has improved further relative to the West European regions.

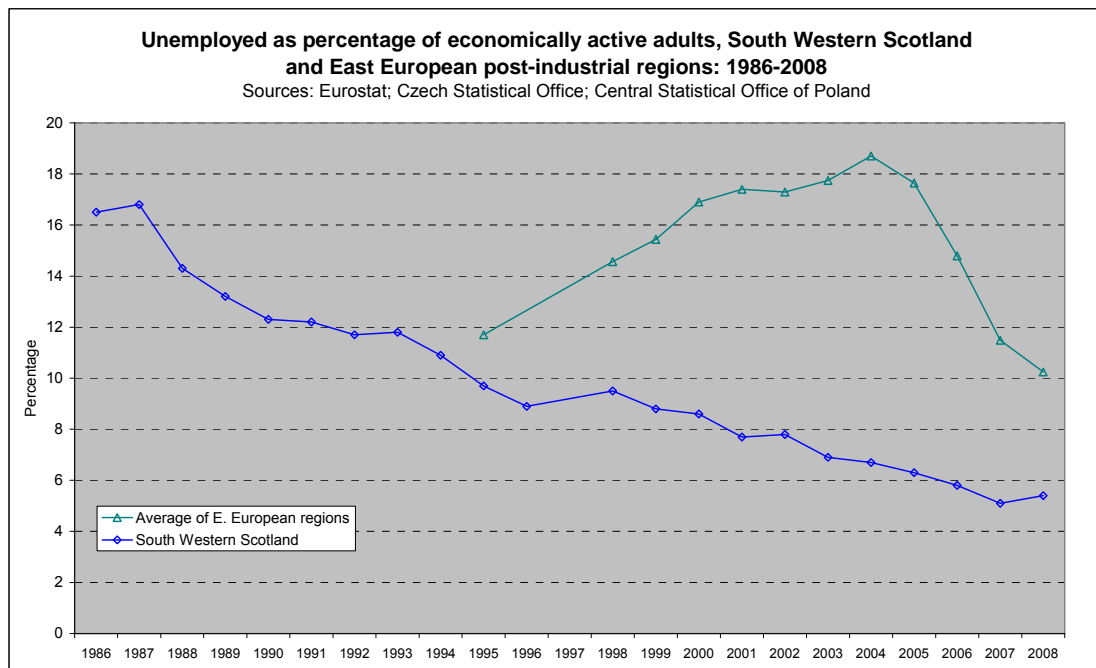
Figure 3.19



^{xxxiii} In 1986, the unemployment rates were 16.5% (South Western Scotland), 18.6% (Merseyside) and 17.7% (Northern Ireland).

Figure 3.20 shows that in the mid-1990s, unemployment levels in South Western Scotland were only slightly lower than the East European regional average. Very high unemployment in the East German regions was offset by lower rates in Northern Moravia and Silesia. However, the late 1990s saw dramatic rises in unemployment rates in these latter regions. By 2004, the unemployment rates gap between the East European regional average and South Western Scotland reached 12 percentage points. The gap narrowed subsequently, but still stood at five percentage points in 2008.

Figure 3.20



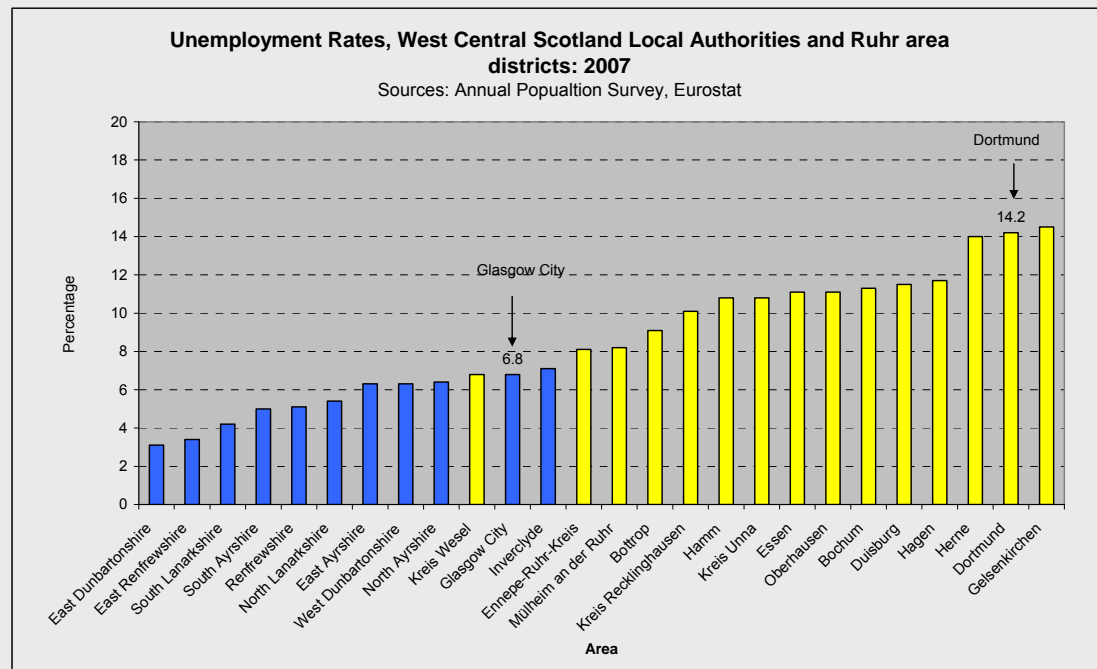


CASE STUDY – THE RUHR AND SILESIA:

Unemployment

Figure 3.21 shows unemployment rates across the 11 local authorities within WCS and the 15 comparably sized districts that constituted the Ruhr area of Germany in 2007^{xxxiv}. Unemployment in almost every Ruhr district was higher than those observed in WCS local authorities. This sharp distinction is underlined by comparing the two largest cities of the German and WCS regions, Dortmund and Glasgow: unemployment rates in the former were twice as high as those found in the latter.

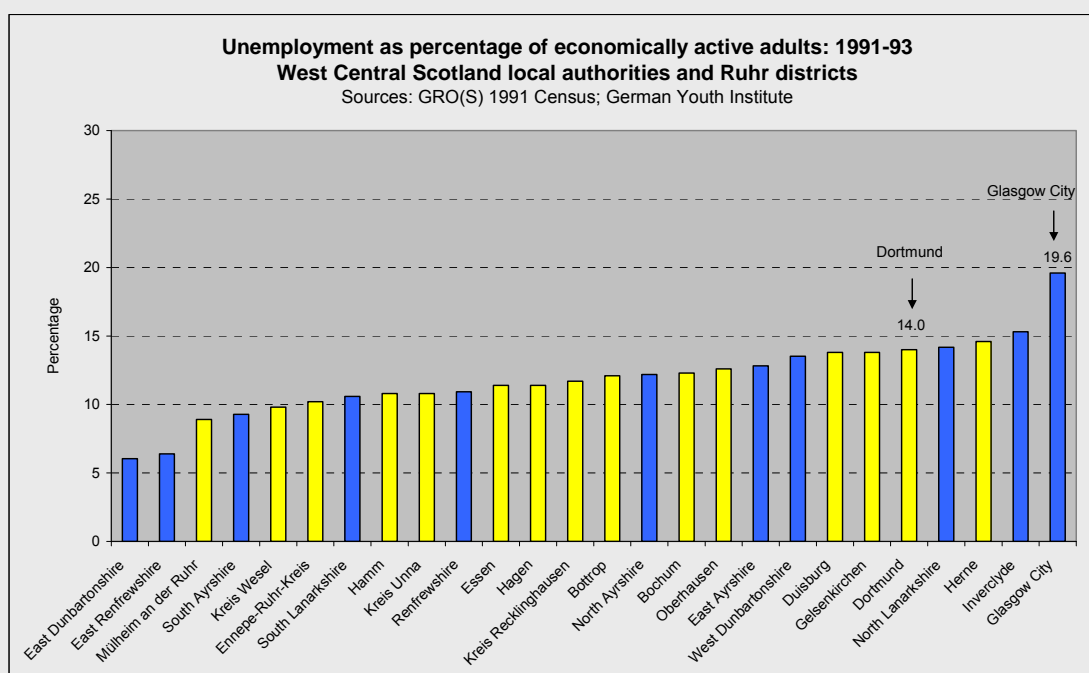
Figure 3.21



^{xxxiv} In 2008, populations in the Ruhr area districts (kreise) ranged from 118,000 (Bottrop) to 636,000 (Recklinghausen). In WCS, district (local authority) populations varied from 80,000 (Inverclyde) to 584,000 (Glasgow City). Dortmund had a population of 584,000 in 2008.

As Figure 3.22 shows, the picture across the two sets of districts in 1991/93 was quite different to that shown in Figure 3.21 above with, for example, higher unemployment in Glasgow compared to Dortmund. While we should be cautious about overstating this improvement, given the diversion into economic inactivity^{xxxv} in both regions^{47 48 49}, these trends are consistent with those shown by other data sets^{50, 51}.

Figure 3.22

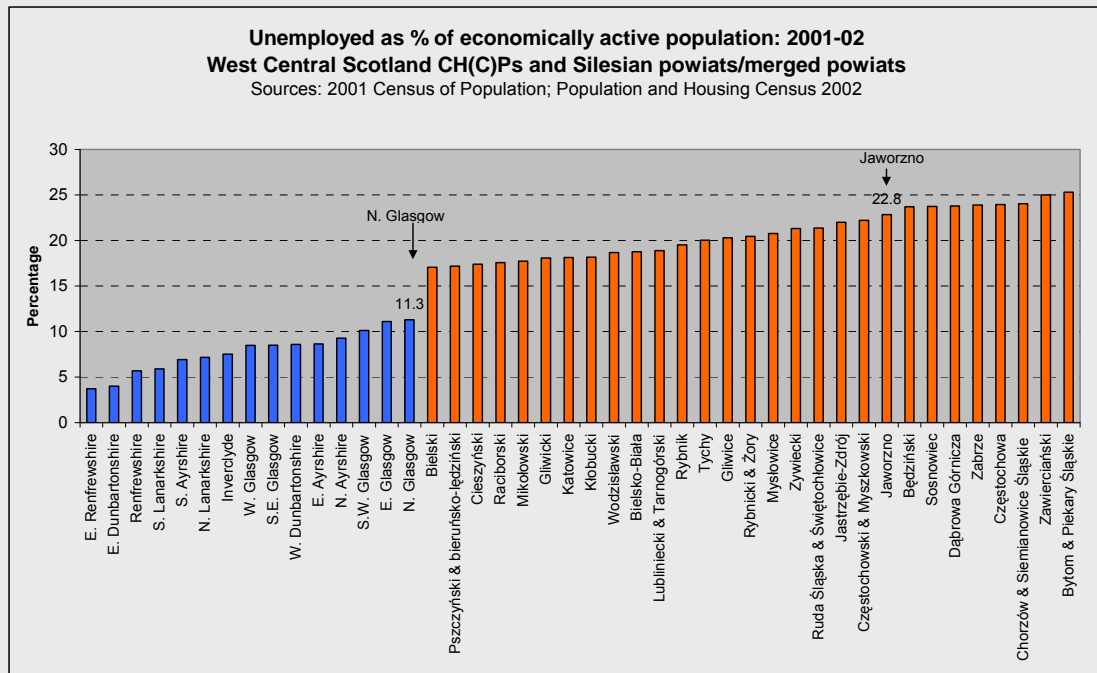


Comparison of levels of unemployment in the 15 WCS CHPs and counties/merged counties^{xxxvi} in Silesia in Poland make the same point (Figure 3.23). In 2001/02, all these sub-regional areas of Silesia had much higher rates than the comparably-sized WCS CHP areas. Jaworzno (a medium-sized industrial city in Silesia) has a similar population size to North Glasgow, but in 2001 unemployment rates were twice as high in the former as the latter.

^{xxxv} During the 1970s and 1980s, working-age people in many countries were diverted from the unemployment rolls towards 'inactivity' (e.g. Incapacity Benefits in the UK and the Netherlands, early retirement pensions in Germany). Once claiming these benefits, they would receive little encouragement or practical assistance in finding new employment.

^{xxxvi} In 2006, populations in the Silesia counties/merged counties (powiats) ranged from 75,000 (Mysłowice) to 315,000 (Katowice City). WCS CH(C)P populations varied from 82,000 (Inverclyde) to 324,000 (N. Lanarkshire). The population of Jaworzno City was c. 95,000, while North Glasgow CH(C)P had a population of c. 100,000.

Figure 3.23



Employment

As noted above, a potential problem with using unemployment as a marker of labour market disadvantage is the growth of 'hidden unemployment'. With the emergence of mass unemployment in many European regions in the 1980s and 1990s, large numbers of working-age adults were diverted (sometimes through the intended and unintended consequences of government policies^{xxxvii}) into economic inactivity, such as early retirement or Incapacity Benefits^{47, 52}. They would not be counted as unemployed, even though in more buoyant economies, many might still be in employment or looking for work. This means that regional comparisons of unemployment might present a misleading picture. If 'hidden unemployment' was worse in WCS then an analysis of unemployment rates alone could give a misleading picture.

In order to partially compensate for this issue, crude *employment* rates were calculated for all regions of interest for the period 1981-2005. These are calculated by simply dividing the number of jobs in each region by the total population aged 15-64. Since most industrial jobs tend to be held by men^{xxxviii} it might be expected that their employment opportunities would have been affected more directly by deindustrialisation: thus, it is sensible to consider employment trends separately by gender. As with unemployment rates, the data for Eastern and Western European regions are shown separately, given the very different context of employment under communism.

^{xxxvii} For example, in the UK, for the unemployed, benefits were made less generous and sanctions and pressure to find work strengthened, with little attention paid to the job opportunities available to the less skilled and less healthy in older industrial regions. It has been argued that this made Incapacity Benefits more attractive. See for example: Webster, D. (2005) Long-term unemployment, the invention of 'hysteresis' and the misdiagnosis of structural unemployment in the UK. *Cambridge Journal of Economics*, 29, pp. 975–995.

^{xxxviii} For example, in 1981, 362,010 residents of the Strathclyde region in West Central Scotland were employed in energy or water, manufacturing or construction. More than three-quarters (276,650, 76%) were male.

Figure 3.24 shows that for men, employment rates in WCS tracked close to the average rate of the other Western European post-industrial regions between 1987 and 2005. Comparisons with the Eastern European regions (shown in Figure 3.25) reveal some interesting trends. In the 1980s, male employment rates in WCS were much lower than those seen in the (then) Communist countries. The gap was large – 15 percentage points in the mid-to late 1980s – and persistent, although this is likely to reflect Communist full employment policies. From the late 1980s, rising employment rates in WCS and falling rates in Eastern Europe meant this gap steadily reduced. By 1997, employment rates for men in WCS matched those in the Eastern European regions. Since then, deteriorating employment rates in the East European regions have meant that the advantage in employment rates enjoyed by men in WCS has increased.

Figure 3.24

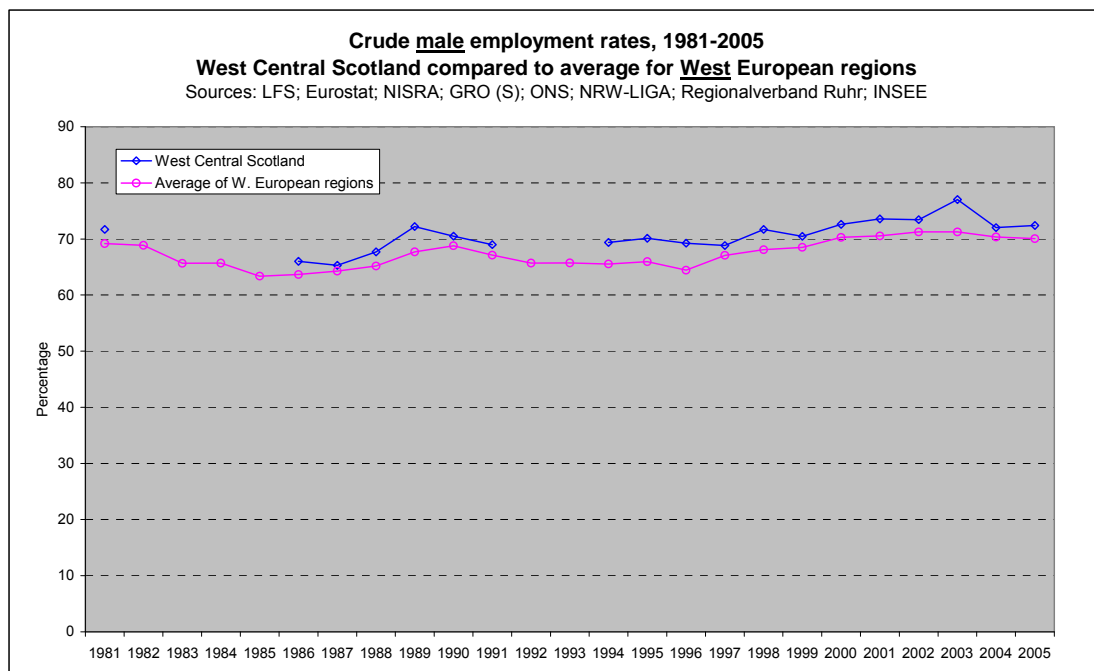
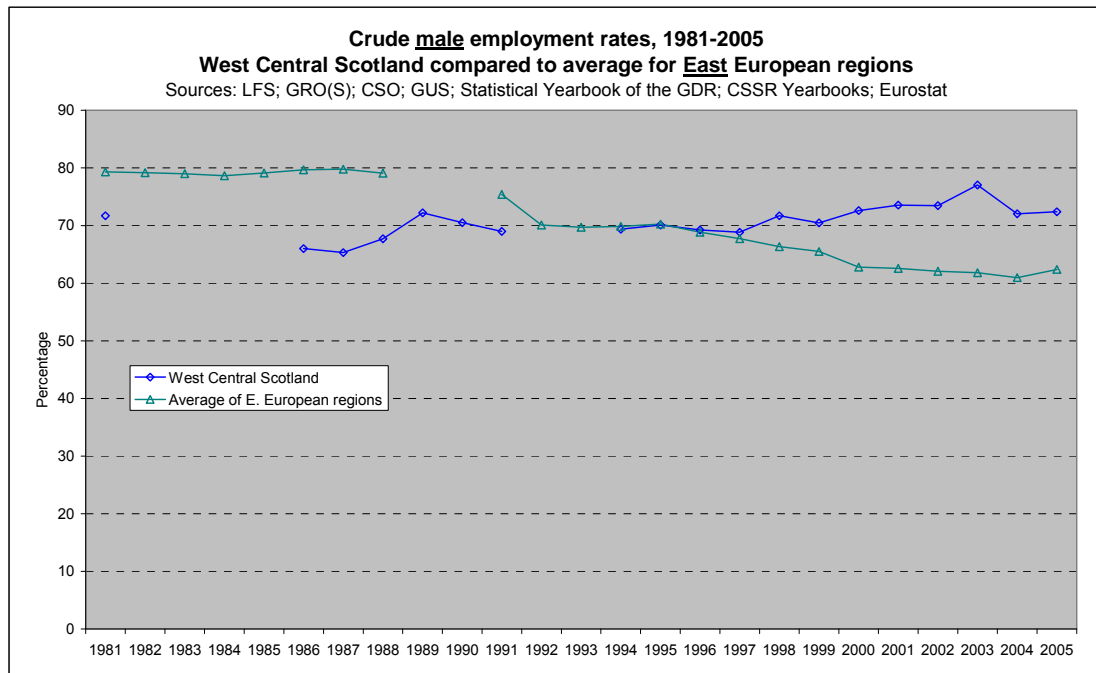


Figure 3.25



Turning to females, the impact is more obvious: employment rates for WCS women were consistently higher than the West European average (Figure 3.26). Trends for Eastern Europe echoed those for men: employment rates were 15-20 percentage points higher in the former Communist regions in the 1980s but had fallen below those seen in WCS by the mid-1990s (Figure 3.27). Note that the high Eastern European rates seen in the 1980s were driven by Saxony, Saxony-Anhalt and Northern Moravia. Women in Silesia had similar employment levels to those seen in WCS in the 1980s (further details are available in the Silesia case study).

Figure 3.26

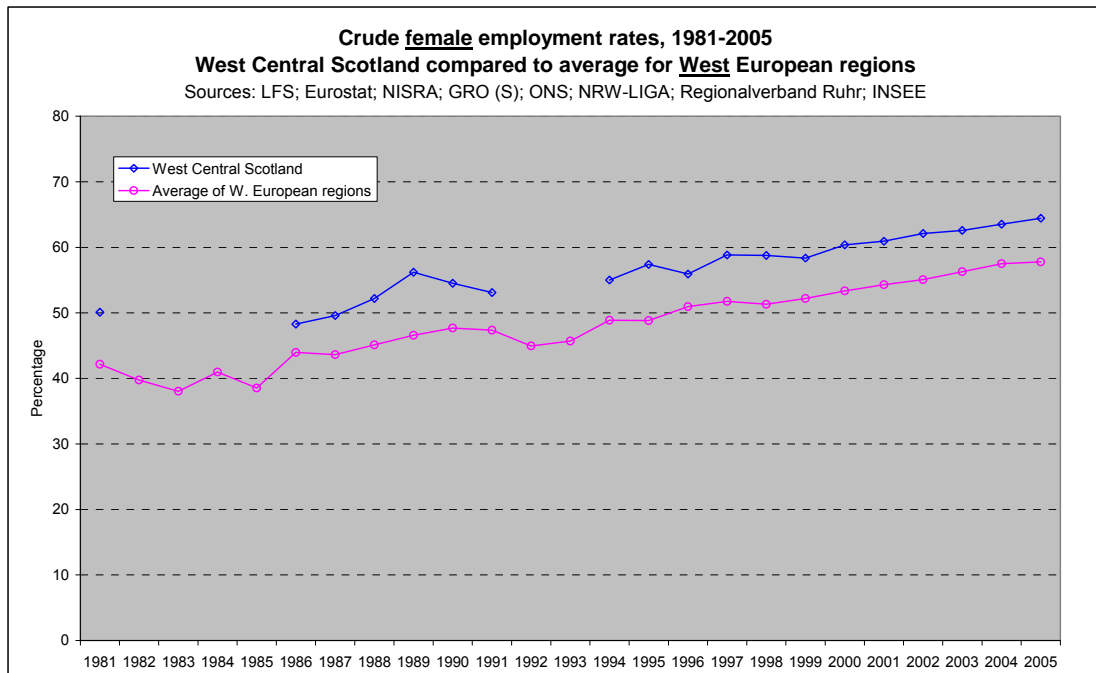
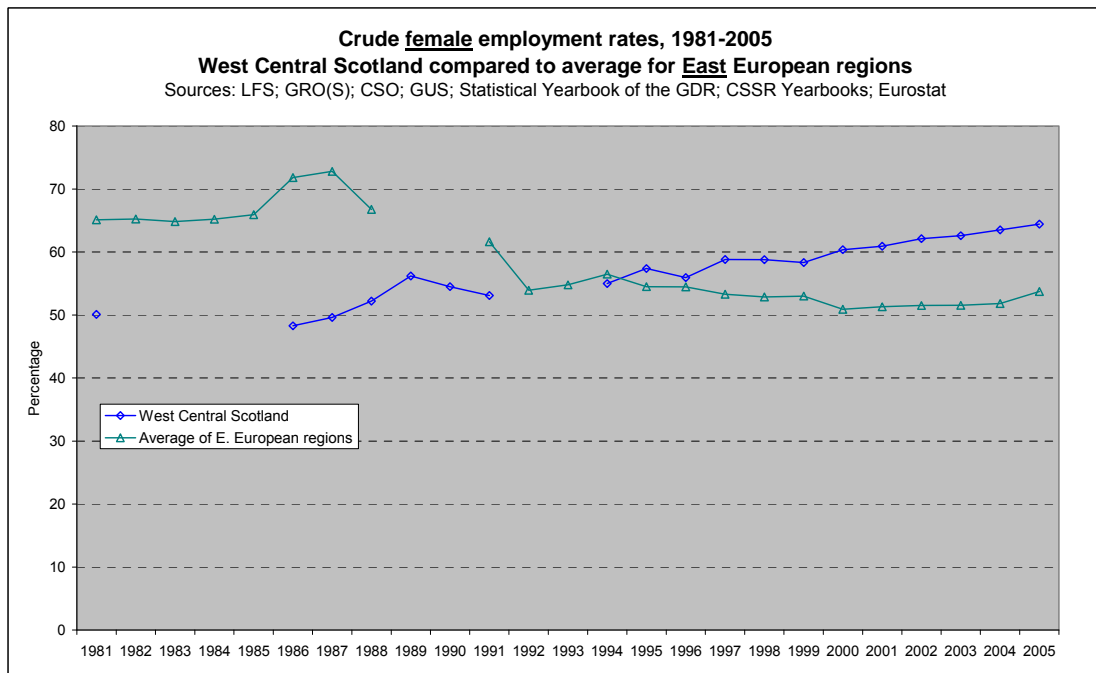


Figure 3.27



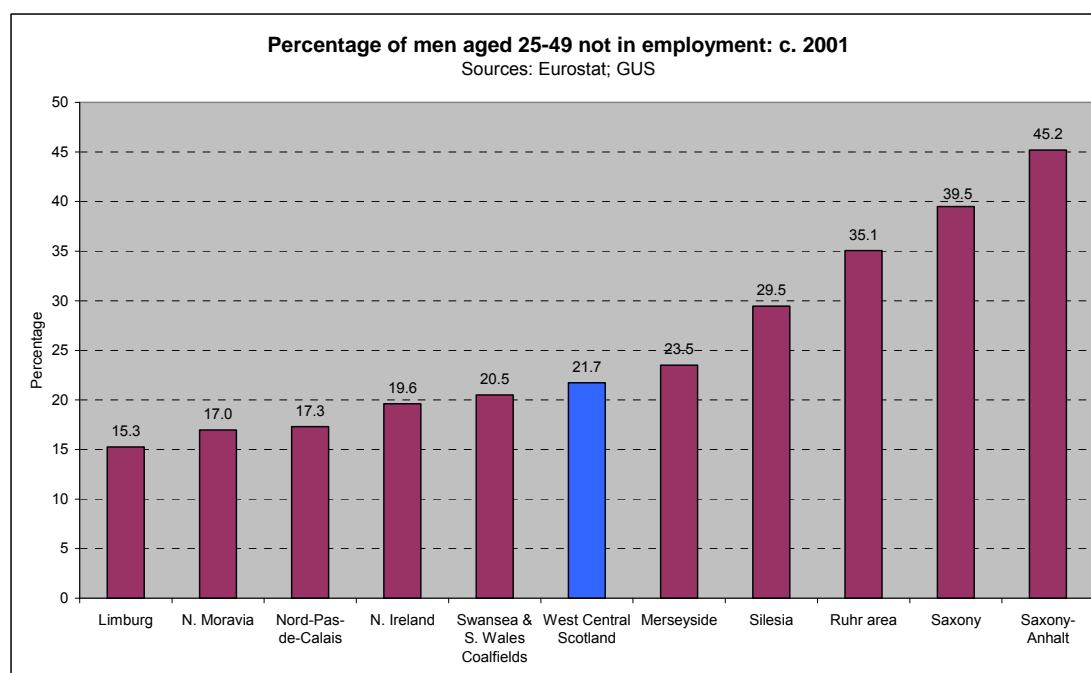
The analyses of employment data presented here have a number of limitations. An unfortunate omission is the absence of WCS employment data for the period 1982-85 – a period of severe recession in Western Europe, especially the UK. In addition, Figures 3.24-3.27 present employment rates at an *individual* level, rather than household level. Comparisons of levels of employment (and non-employment) at a household level would be a useful addition, but unfortunately the required data are not readily available for European regions. It would also be interesting to compare the types of employment that replaced traditional jobs in heavy industry across these regions, as well as the quality of new work on offer (in terms of pay, conditions etc.).^{xxxix} Nevertheless, overall it is difficult to conclude that the scale of working-age exclusion from the labour market was higher in the Scottish region.

Worklessness

Crude employment rates may still not capture the extent of labour market opportunity, because of regional differences in pension provision (likely to affect those aged 50+) and participation in full-time education (which will have a greater impact on younger adults under the age of 25). Higher levels of early retirement and longer stays in education might lead to lower employment rates among 15-64 year olds but may also be beneficial for individuals and populations. Cultural differences in female labour market participation also make comparisons for women problematic. To adjust for this, the final measure of labour market participation examined here is non-employment among men aged 25-49 (Figure 3.28).

^{xxxix} Some of these issues are being investigated in an accompanying piece of research cited earlier, and discussed in more detail in Part Four.

Figure 3.28



Note: Results not available for Wallonia region.

In 2001, male non-employment among this age group in WCS is similar to rates seen in the other UK areas (N. Ireland, Swansea & S. Wales Coalfields and Merseyside), and compares very favourably to a number of other regions, especially Silesia and the three German areas.

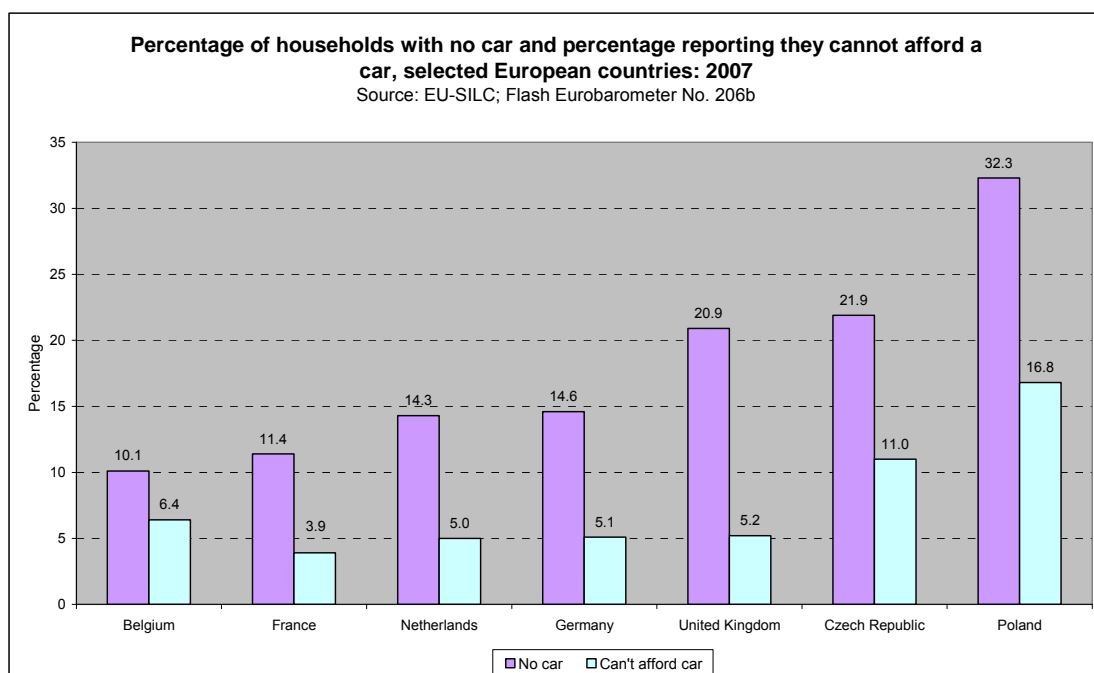
Note also that other measures of labour market participation (such as economic activity, shown in the first 'Aftershock' report) also present WCS in a favourable light (data not shown here).

Car ownership

Car ownership has been used in a number of UK studies and deprivation measures as a proxy for available income. Research has also shown the indicator to be associated with health status within the UK⁵³. WCS research has shown it to be predictor of health not just because it is a marker of disadvantage but because of independent effects⁵⁴. These included greater "privacy, freedom, status and safety" than those using public transport⁵⁵.

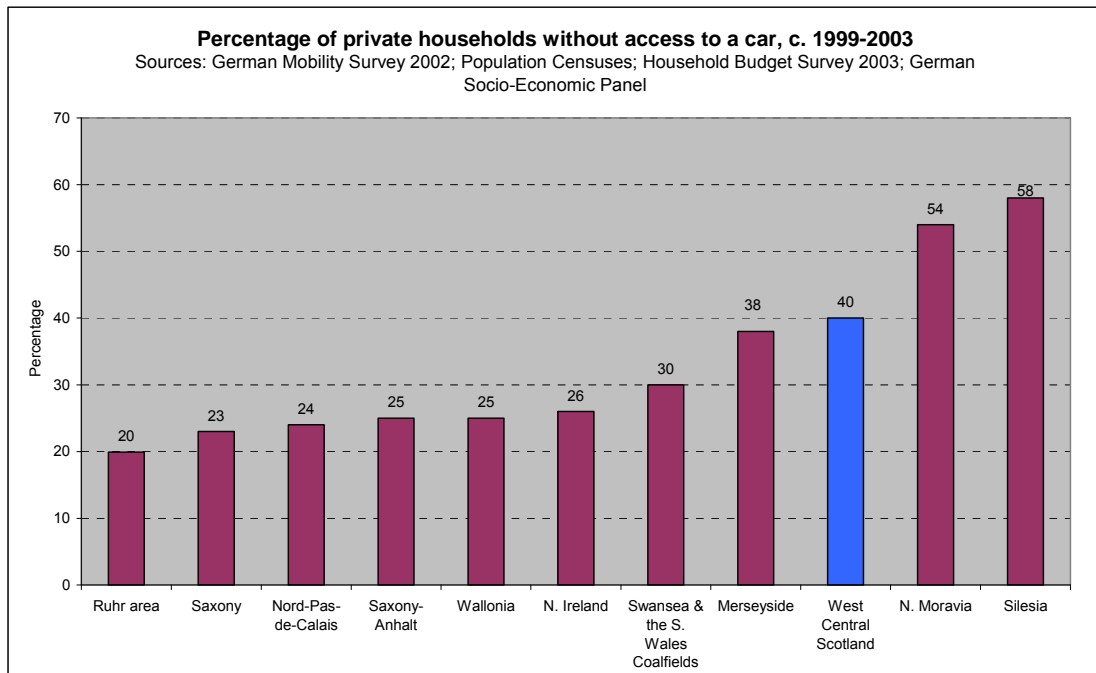
However, we need to be cautious about the extent to which car ownership can be compared internationally, due to differences in culture, public transport provision and relative affordability. In 2007, the percentage of households who did not own a car was higher in the UK than in Germany, France, Belgium and the Netherlands, but the percentage reporting that this was because they could not *afford* to do so was very similar across West European counties (Figure 3.29). Household car ownership may be less valuable as a proxy for material prosperity when compared across different countries.

Figure 3.29



Nevertheless, a large minority (40%) of households in WCS reported that they lacked access to a car/van in 2001. This figure was very similar to the levels seen on Merseyside, though both areas have higher percentages compared to the German and other West European regions, where the percentage of households without a car ranged between one-fifth and one-third. However, the percentage of households without a car was substantially higher in Northern Moravia and Silesia (Figure 3.30).

Figure 3.30



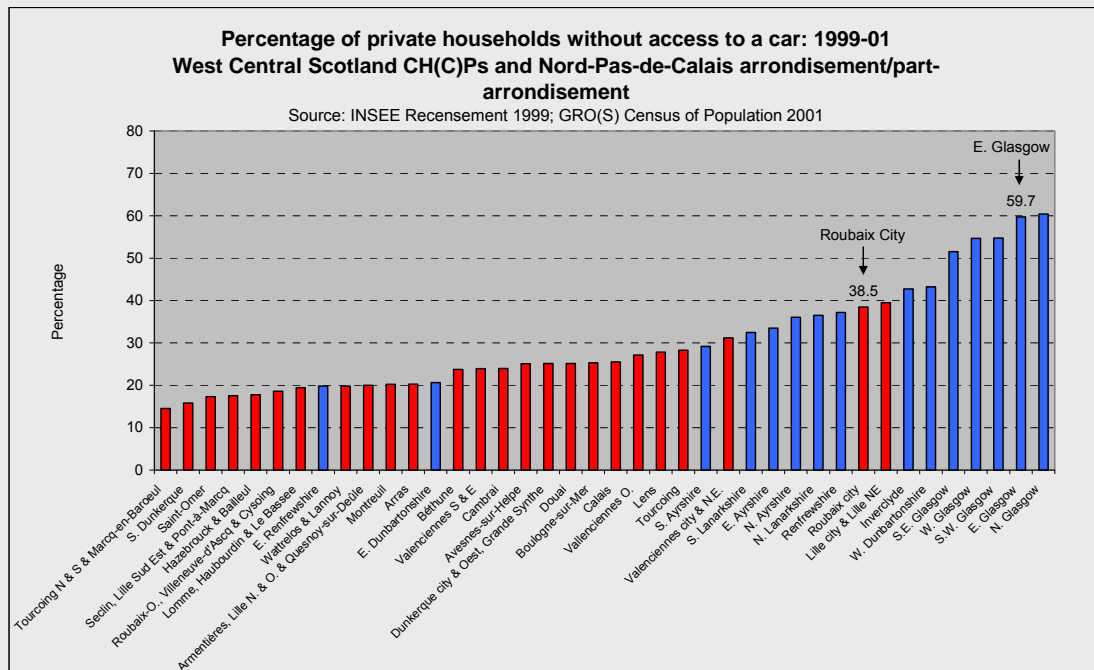
Note: Data unavailable for Limburg.



CASE STUDIES – NORD-PAS-DE-CALAIS AND NORTHERN MORAVIA: car ownership

Household car ownership in WCS is low compared to other West European regions. Figure 3.31 shows the percentage of households that lacked access to a car in 1999-01 across 25 Nord-Pas-de-Calais districts/part-districts and the (comparably sized) 15 WCS CHPs^{xi}. For example, in the former textile city of Roubaix, four out of 10 households were without a car, but in East Glasgow CH(C)P the figure was six in 10. It is also notable that the five CHPs with the highest reported lack of car ownership were all in the city of Glasgow.

Figure 3.31

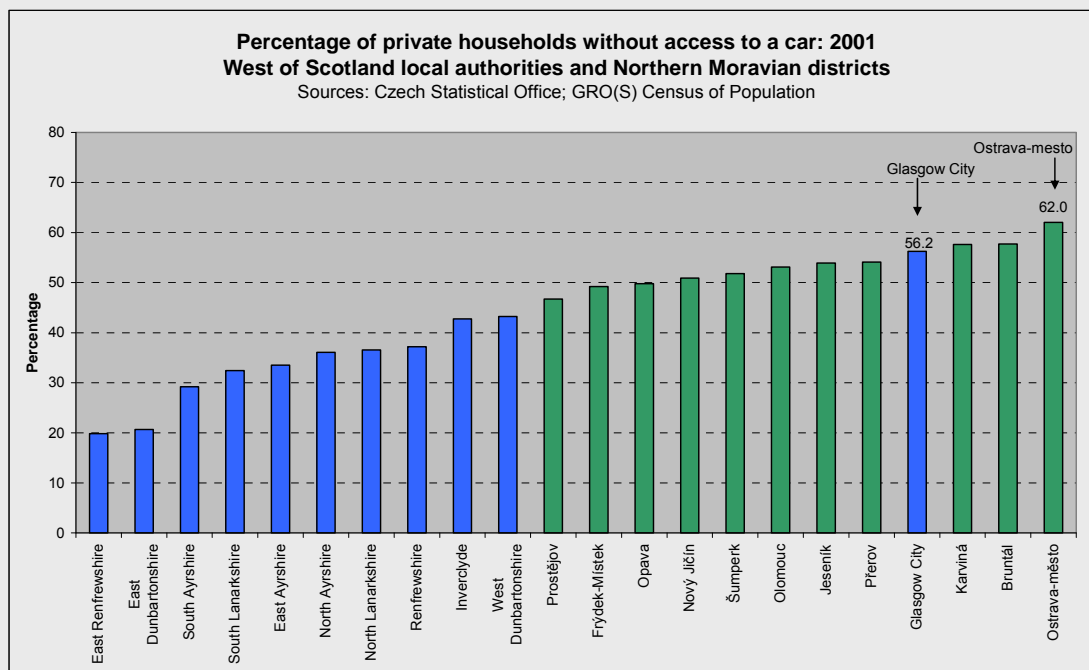


Glasgow’s role as an ‘outlier’ on this indicator can also be illustrated by comparing WCS districts with those in Northern Moravia in the Czech Republic (Figure 3.32). Even relatively deprived local authorities (such as West Dunbartonshire and Inverclyde) had rates of car ownership that

^{xi} In 2006, Nord-Pas-de-Calais district/part-districts (arrondissements) varied in size from 77,000 (Valenciennes S & E) to 322,000 (Lens). Roubaix City had a 2006 population of 98,000, compared to 123,000 in E. Glasgow.

compared favourably against those in the Czech region.^{xii} By contrast, the percentage of Glasgow households lacking access to a car/van was very close to the levels seen in some Czech districts. Despite this, Glasgow still compared well with the more urbanised parts of Northern Moravia, such as Ostrava-město, an industrial conurbation of 337,000 people.

Figure 3.32



^{xii} In 2007, N. Moravia districts (okresy) ranged in size from 42,000 (Jeseník) to 337,000 people (Ostrava-město). Jeseník was something of an outlier though: the remaining okresy had populations of between 100,000 and 337,000, closer to the WCS population distribution.

Percentage of households not owning their own home

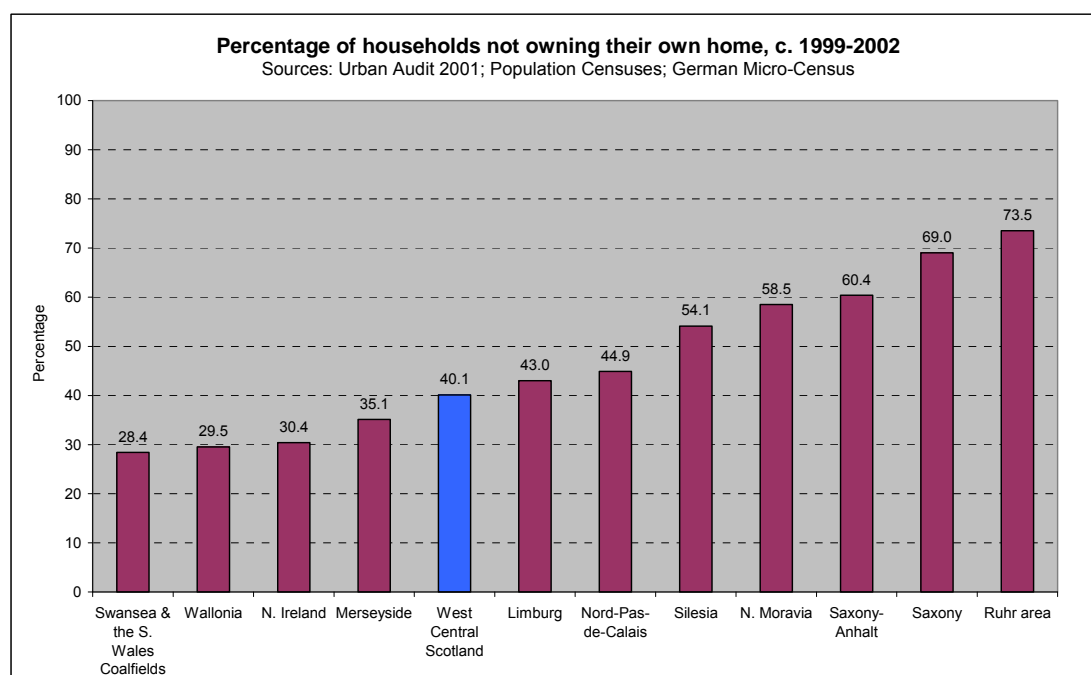
Lack of home ownership has been used as a measure of relative disadvantage in many studies of health and deprivation in the UK⁵⁶. Research in WCS suggests tenure choice predicts health not just because of its association with household prosperity but because it may also indicate how exposed people are to other issues (e.g. overcrowding, dampness, neighbourhood crime, neighbourhood social capital) that can impact on health⁵⁷.

Clearly, however, as with car ownership, we should be cautious about whether different levels of renting in European countries are a straightforward proxy for prosperity in these regions. For instance, social housing constitutes a much larger proportion of the rental housing stock in the Netherlands and the UK than in Germany and France, and the very poorest are less concentrated in rented accommodation in Germany and the Netherlands than in the UK and France⁵⁸. There is also some evidence that the stigma attached to renting social housing is low in the Netherlands and Germany⁵⁹. In turn, these differences may mean that the association between tenure choice and health also varies between countries.

Figure 3.33 shows that a large minority (40.1%) of households in WCS did not own their own home in 2001. Although this is higher than rates seen in the other UK regions and Wallonia, it is similar to levels seen in Nord-Pas-de-Calais and Limburg and much lower than the German and East European regions. As noted in the case studies, growth in home ownership was also much more marked in WCS compared to Nord-Pas-de-Calais and the Ruhr during the 1990s, partly reflecting 'Right-to-Buy' policies in the Scottish region^{xlii}.

^{xlii} Introduced in 1980, the Right-to-Buy scheme gave tenants of council housing in the UK the right to buy the home they lived in. From March 2011, those renting social housing for the first time in Scotland or those returning to rent social housing no longer have the right to buy.

Figure 3.33

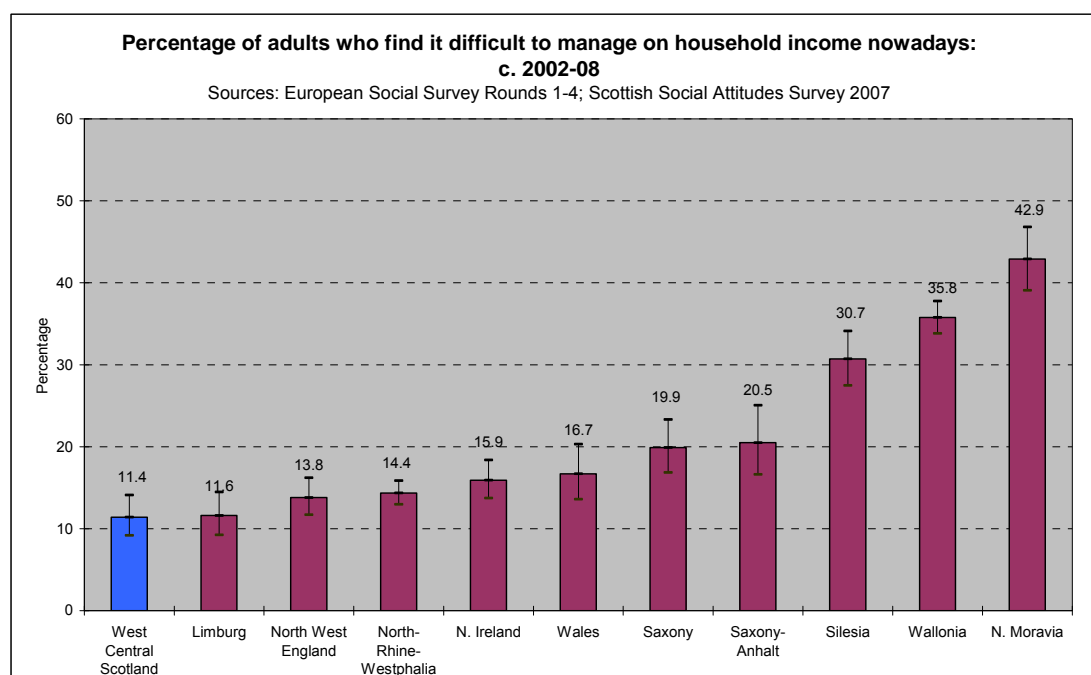


Perceived adequacy of household income

So far the measures presented in this section have been objective measures of prosperity. Here we look at self-assessed prosperity, based on survey questions relating to how easy or difficult people find it to ‘manage’ on their levels of household income. According to this, in 2007 just over one in 10 (11.4%) of adults in WCS reported that they found it difficult to manage on their household income nowadays. This was comparable to the rates observed for almost all the West European regions. It was also significantly below the rates reported in Silesia, Wallonia and Northern Moravia, where more than one in three adults fell into this category (Figure 3.34)^{xliii}.

^{xliii} Data for this chart are taken from the Scottish Social Attitudes Survey (SSAS) for 2007 and – for the other regions – the European Social Survey (ESS). ESS data are taken from Rounds 1-4 of the survey which cover the years 2002, 2004, 2006, and 2008. However, reported values for this question for the selected regions do not vary significantly between rounds. Note also that ESS data are available for all Scotland (but not WCS), and the figure for this question is close to that for WCS taken from the SSAS: 12.8%.

Figure 3.34



Sample sizes: WCS=534, Limburg=568, North West England=906, North-Rhine-Westphalia=1854, N. Ireland=958, Wales=460, Saxony=1046, Saxony-Anhalt=635, Silesia=770, Wallonia=2275, N. Moravia=575. Nord-Pas-de-Calais results not shown as ESS French sample not representative at regional level. Wales used as proxy for Swansea & S. Wales Coalfields; North-Rhine-Westphalia used as proxy for the Ruhr area. NW England used as proxy for Merseyside.

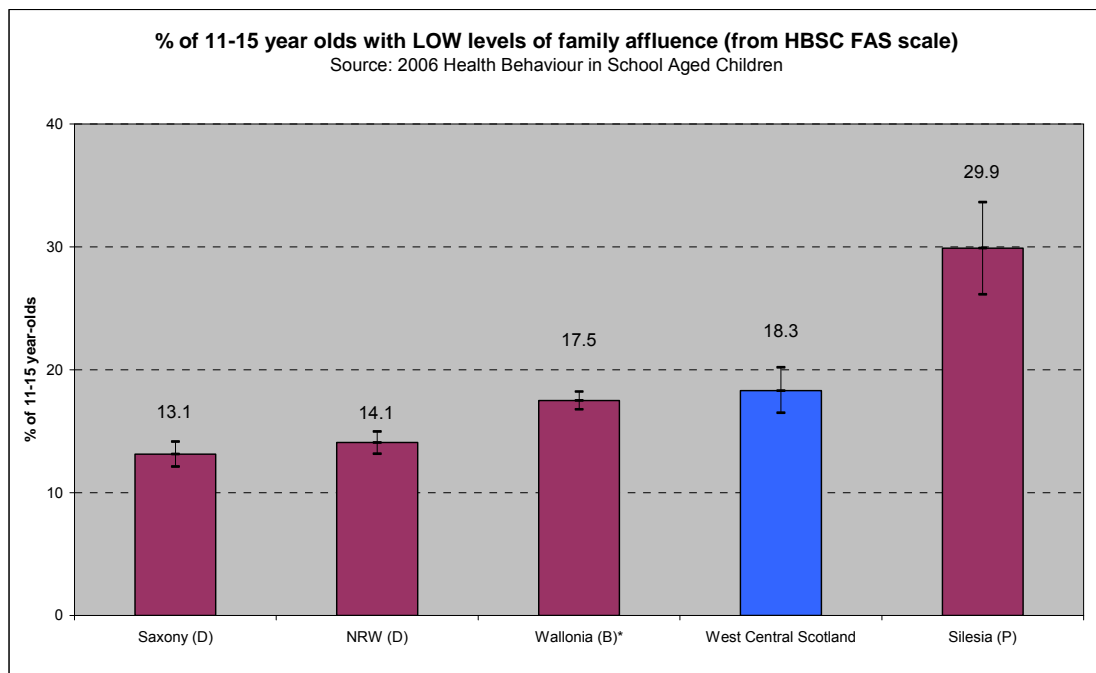
Family Affluence Scale

The Family Affluence Scale is calculated from young people's responses to four questions in the WHO-collaborative Health Behaviour in School-aged Children survey (HBSC)⁶⁰. The questions relate to: family ownership of a car; ownership of computers; whether the young person has their own bedroom; and number of family holidays in the year prior to the survey. A composite score is derived from the answers to these questions and, from this, families can be assessed as being of low, middle or high levels of affluence⁶¹. Although data from the survey are usually only reported at national level, representative samples of five of our regions of interest have been obtained for the purpose of this project: WCS, Silesia, Saxony, North-Rhein-Westphalia (as a proxy for The Ruhr) and Wallonia^{xliv}. Figures 3.35 and 3.36 show the percentages of 11-15 year-olds in these regions who are classed as being of: low family affluence (Figure 3.35), and high family affluence (Figure 3.36).

^{xliv} Note, however, that data for Wallonia in fact actually relate to 'French-speaking Belgium', which includes the Brussels region as well as Wallonia. The inclusion of Brussels will impact on the values of the data shown in Figures 3.35 and 3.36.

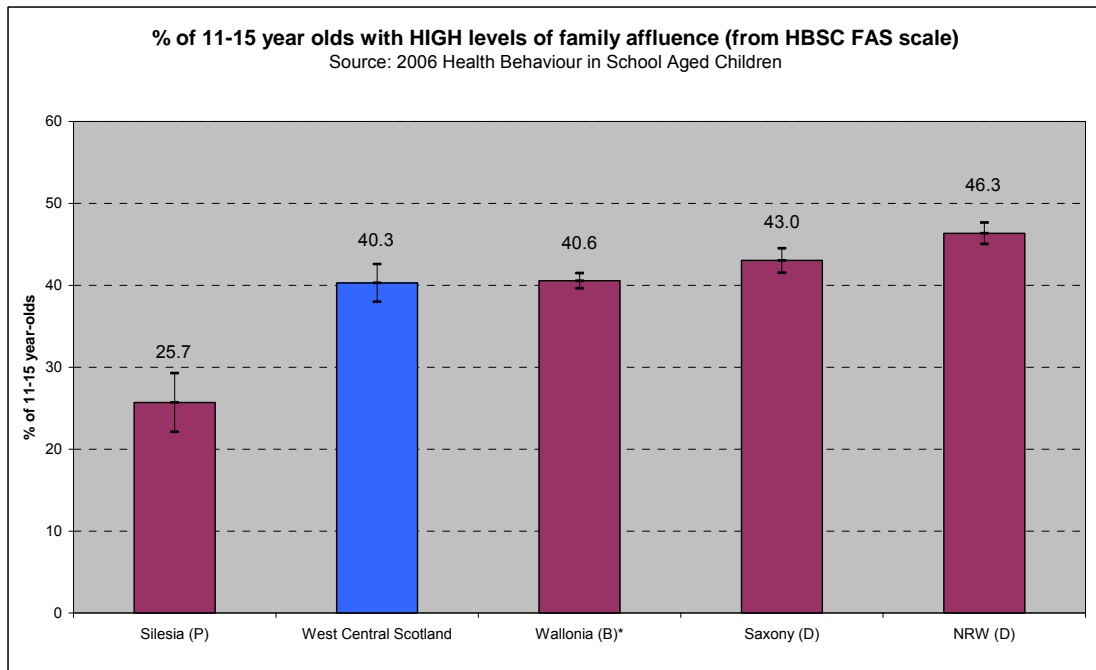
The data show that Silesia in Poland has the highest percentage of children living in low affluence families. WCS has a slightly (and significantly) higher percentage of 'low affluence' than the two German regions. The data for 'high affluence' show no significant differences between WCS, Wallonia and Saxony. However, WCS appears considerably wealthier than Silesia in these terms, and slightly less wealthy than North-Rhein-Westphalia.

Figure 3.35



Sample sizes: Saxony=4225; North-Rhine Westphalia=5642; Wallonia=10676; West Central Scotland=2547 ; Silesia=572. *Note that data for Wallonia actually relate to 'French-speaking Belgium', which includes the Brussels region as well as Wallonia. This is likely to impact on the values of the data shown.

Figure 3.36



Sample sizes: Saxony=4225; North-Rhine Westphalia=5642; Wallonia=10676; West Central Scotland=2547 ; Silesia=572. *Note that data for Wallonia actually relate to 'French-speaking Belgium', which includes the Brussels region as well as Wallonia. This is likely to impact on the values of the data shown.



CASE STUDY: INCOME DEPRIVATION IN UK POST-INDUSTRIAL REGIONS

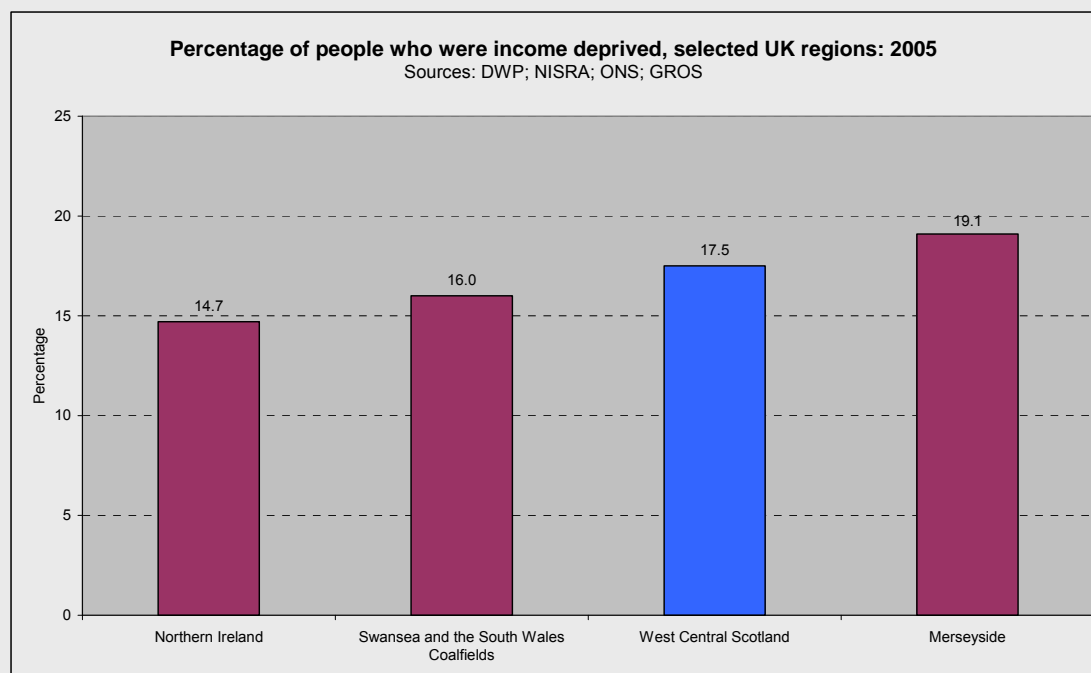
For the UK post-industrial regions only, we can make more detailed comparisons of income related deprivation.

The indicator is 'income deprivation' from 2005. Income deprivation is derived from Department of Work and Pensions (DWP) benefits data, and was used in the 2006 Scottish Index of Multiple Deprivation (SIMD)¹⁷. It is a measure of the proportion of the population in receipt of key income-related benefits in 2005, as well as children dependent on adult recipients of those benefits^{xiv}. Importantly, this measure has been shown to be an excellent proxy for levels of 'multiple deprivation' within both Scotland and England¹³.

Figure 3.37 shows the level of income deprivation in WCS in 2005 compared to the three other UK regions. Levels of deprivation in WCS were slightly higher than in the Welsh region and Northern Ireland but a little below those observed on Merseyside.

^{xiv} The components of 'income deprivation', as defined by the 2006 SIMD, are: number of elderly in receipt of Guaranteed Pension Credit; number of working age adults in receipt of Income Support; number of adults in receipt of Job Seekers Allowance; number of children dependent on a recipient of Income Support; number of children dependent on a recipient of Job Seekers Allowance. The total number of these 'income deprived' are shown as a percentage of the total population in each small area.

Figure 3.37



Recent research has examined in detail the link between this measure of deprivation and mortality within post-industrial settings. One study compared the deprivation profile of Glasgow with that of Liverpool (and Manchester), and explored the extent to which any differences in deprivation levels explained Glasgow's higher mortality^{13,14}. Using small area based analyses (spatial units with an average of 1,500 population), the research showed the deprivation profiles of all three cities (but in particular Glasgow and Liverpool) to be virtually identical. Analyses of historical data suggested there had been little change in relative levels of deprivation at a city level since the 1950s^{xlvi}. However, premature mortality in Glasgow for the period 2003-07 was more than 30% higher compared to Liverpool and Manchester (36% higher compared to Liverpool alone). Mortality at all ages was around 15% higher in Glasgow than Liverpool & Manchester (13% higher compared to Liverpool alone).

^{xlvi} Measures examined included: male unemployment rates and the percentage of adult males in Social Class 4 & 5 (for the period 1951-2001); car ownership and overcrowding (for the period 1981-2001); and the percentage of households classified as 'core poor' (between 1970 and 2000).

Identical analyses, based on the same data sources and methodology, compared deprivation and mortality in Glasgow and Belfast⁶². At a city level, levels of deprivation were slightly higher in Glasgow than in Belfast (24.8% of Glasgow's population were classed as income deprived in 2005 compared to 22.4% for Belfast). However, after statistically adjusting for any differences in deprivation across all parts of both cities, premature mortality in Glasgow was still 27% higher than in Belfast, with all deaths 18% higher.

The data included within this section of the report suggest that WCS compares reasonably favourably with the majority of other European post-industrial regions in relation to measures of absolute poverty and prosperity: these findings will be discussed further in Part Four. However, absolute levels of prosperity, of course, say nothing about the *distribution* of wealth within regions (and the impact on relative levels of poverty). In the next section, we seek to address this by examining measures of relative poverty and income inequality across the regions.

Summary: Prosperity and poverty

- **Unemployment** rates were generally slightly higher in West Central Scotland (WCS) in the 1980s but improved relative to the average for other post-industrial regions in the 1990s.
- **Employment** rates for men in WCS have been similar to the average for Western European post-industrial regions since the late 1980s. Rates in WCS were lower than those seen for Eastern European regions in the earlier parts of the 1980s but its relative position improved dramatically in the early to mid 1990s with the collapse of communism.
- Employment rates for WCS women have been consistently higher than the average rates for West European post-industrial regions since 1981. Trends for Eastern Europe have closely mirrored those observed for men.
- In 2001, male non-employment (**'worklessness'**) among 25-49 year-olds was high in WCS compared to a number of West European regions and Saxony, but was still below rates of non-employment in Merseyside and (especially) Silesia and the three German regions.
- **Car ownership** among West Central Scotland households is low by West European standards but high compared to the East European regions.
- Survey data suggest that only around out of 10 adults in WCS find it difficult to manage on current levels of **household income**. This is similar to levels reported for all West European regions except Wallonia, and well below rates reported for East European regions.
- In 2005, **'income deprivation'** (as measured by UK welfare benefits data) in West Central Scotland was higher than levels observed in Swansea and the South Wales Coalfields and Northern Ireland, but slightly lower than rates seen on Merseyside.
- None of the measures of prosperity shown here provide a compelling

3.4 Income inequality, relative poverty and spatial segregation

Introduction

In the 'Discussion' section of the first 'Aftershock' report, the authors speculated that West Central Scotland may experience wider levels of income inequality than the other regions and/or steeper increases in the level of income inequality than other regions over time. This would be important, given the published evidence on the impact of such inequalities on health outcomes^{63, 64, 65, 66}: Wilkinson and colleagues have argued that more unequal societies exhibit a range of adverse health and well-being related outcomes compared to societies of comparable wealth but more equal distribution. It is argued that these outcomes develop through 'psychosocial' processes that operate at the level of whole societies, rather than smaller communities or regions. Wilkinson and others have, therefore, presented evidence for countries, and also U.S. states, but not for regions. However, it is at least possible that the phenomenon described by Wilkinson et al is also manifested at a regional level. Consequently in this section we present national data for the 'parent' countries of the post-industrial regions, but in addition present new analyses of regional data.

Methodological note: the Gini coefficient

This section compares income inequality between Scotland and other nations, and West Central Scotland and other regions. Income inequality is measured here by the Gini coefficient, which measures the dispersion or inequality of a distribution. The Gini coefficient can have a theoretical value between zero and one, with zero indicating complete equality of income distribution and one complete inequality. In reality, most middle- and upper-income countries tend to have a Gini between 0.20 and 0.40.

Published estimates of Gini coefficients at a national level are available from a number of sources, such as the EU-SILC (European statistics on income and living conditions)⁶⁷, the OECD (Organisation for Economic Co-operation and Development)⁶⁸ and the Luxemburg Income Study (LIS)⁶⁹. For the national comparisons, data were taken from the Luxemburg Income Study, which is specifically designed for international comparisons of poverty and income inequality (e.g. by ensuring common definitions of household income, variables and file structures) and allows comparisons to be made between different parts of Europe back to the 1980s. For the regional comparisons, LIS data were supplemented by data from the Scottish Household Survey (for WCS) and the Family Resources Survey (for Merseyside) with Gini coefficients calculated using an identical methodology to that used for the LIS data.

There are many different ways and methods to calculate the Gini coefficient. To ensure comparability, all our calculations use the net disposable income (i.e. income after taxes and housing costs). Since households usually differ in size, this must be adjusted for in the calculations. This process of adjustment is known as 'equivalisation'. The equivalisation method used here was the method favoured by LIS, the square root scale^{xlvii}. 90% Confidence intervals were calculated for each Gini estimate using the 'bootstrap' method⁷⁰.

^{xlvii} Household disposable income was divided by the square root of the number of people in each household and this new set of income figures was then used to produce Gini Coefficient estimates.

Different methods of equivalisation (and different definitions of household income) may produce different estimates of the Gini coefficient. The Scottish Government uses the OECD income equivalisation scale to produce its estimates of Gini. However, the scale of difference tends to be small and affects the international 'ranking' of regions and nations only marginally. For example, in 2005-06, the Scottish Government estimated a Gini coefficient for Scotland of 0.31, similar to the LIS figure from around the same period of 0.32⁷¹.

N.B. As stated above, *regional* income inequality estimates were calculated from Scottish Household Survey (SHoS) data. SHoS data are not used by the Scottish Government to calculate Gini coefficients. This is because of the potential impact of definitional differences regarding the number of adults from whom income data is collected (more details of this are provided in Appendix A^{xlviii}). *Therefore, the data calculated from this source which are presented in this section should be interpreted with caution.* That said, comparisons of *national* Gini coefficients calculated from this survey for Scotland are almost identical to the national estimates published by the Scottish Government (0.31 vs. 0.31)^{xlix}. Furthermore, advice by experts in LIS was that these definitional issues were unlikely to impact significantly on the calculation of the coefficient estimates. For both these reasons, the regional estimates from SHoS are included within this section.

This section draws extensively on the work and assistance of Gary Lai and David K. Jesuit.

^{xlviii} In essence this relates to the fact that the Scottish Household Survey only collects income data from the 'head of the household' and his/her spouse, but not any other earning adult. Scottish Government estimates are based on survey data (from the Family Resources Survey Households Below Average Income Dataset) which includes income data from a third adult.

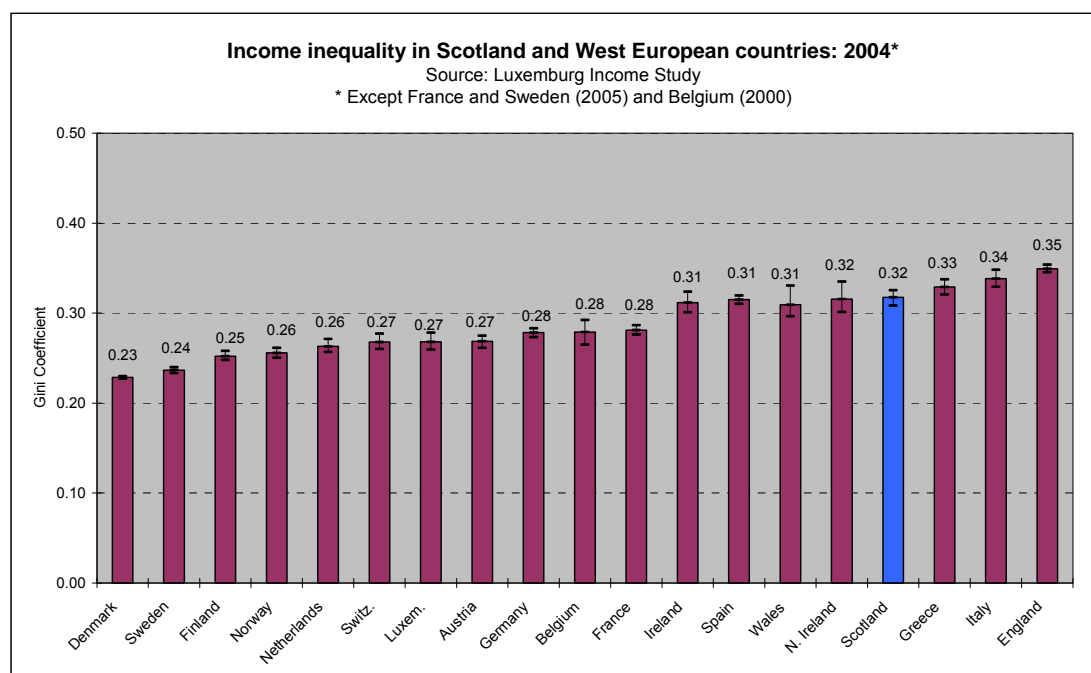
^{xlix} Gini coefficient for Scotland calculated from 2005-06 SHoS data (using LIS methodology): 0.31; Scottish Government Gini coefficient based on 2005-06 Family Resources Survey Households Below Average Income Dataset: 0.31. Clearly, however, similarity of results at the national level does not necessarily exclude potential differences at a regional level.

National comparisons I: how unequal is Scotland?

Figure 3.38 shows the most recent available income inequality data for 18 West European countries, including Scotland. Denmark and Sweden have the very lowest levels of income inequality. Most of the remaining countries of Western Europe, including France, Germany, Belgium and the Netherlands, have Gini coefficients in the range 0.25-0.28. With a Gini coefficient of 0.32, Scotland lies in the third group of countries (which also includes Spain, Ireland and the other Celtic nations of the UK), with relatively high levels of inequality. Finally, Italy, Greece and England¹ had the very highest levels of income inequality in Western Europe.

As an aid to interpretation of these data, it may be useful to consider that OECD have previously described a difference in the Gini coefficient of +/- 0.025 as being 'substantial'ⁱⁱ, ⁷².

Figure 3.38



Sample sizes: Denmark=83304; Sweden=16268; Finland=11227; Norway=13123; Netherlands=9356; Switzerland=3270; Luxemburg=3622; Austria=5147; France=10301; Germany=11290; Belgium= 2080; Ireland=6083; Spain=12884; Wales=1224; N. Ireland=1911; Scotland=4472; Greece=5546; Italy=7996; England=20125.

¹ This may reflect the very high levels of income inequality seen in Greater London. In 2004, the Gini coefficient for household income in the capital was 0.409, compared to 0.345 for the UK as a whole (Luxemburg Income Study, GCPH analysis).

ⁱⁱ OECD (2008) suggest that changes in the Gini of >0.025 should be regarded as a 'significant increase/decrease'; change between 0.01 and 0.0249 should be considered as a 'small increase/decrease'; and change of less than 0.01 represent 'no change'.

Although not shown in Figure 3.38, the Gini coefficient for the UK as a whole in this year was the same as the figure for England, 0.35⁶⁹. It could, of course, be argued that in a discussion of income inequality, WCS's 'parent' country should be more appropriately viewed as the UK, given that the region (and Scotland as a whole) has been subject to economic policies generated by UK (not Scottish) governments; indeed, the Scottish Parliament currently has very limited fiscal powers. While bearing this important issue in mind, in both phases of this project we have presented data for the UK nations separately, and for the sake of consistency we continue to do so here.

International comparisons for the same countries and time periods using EU-SILC (European statistics on income and living conditions) data largely confirm the analysis presented in Figure 3.38. The ranking of countries was very similar, with the four Scandinavian countries emerging as the most equal and Greece, Italy, Spain and Ireland the most unequal. Scotland was closer to the latter group of countries. For only one country, Belgium, was there a discrepancy between the two sources: EU-SILC reports a higher Gini coefficient, placing it alongside Scotland, whereas LIS produces a lower figure, similar to France.

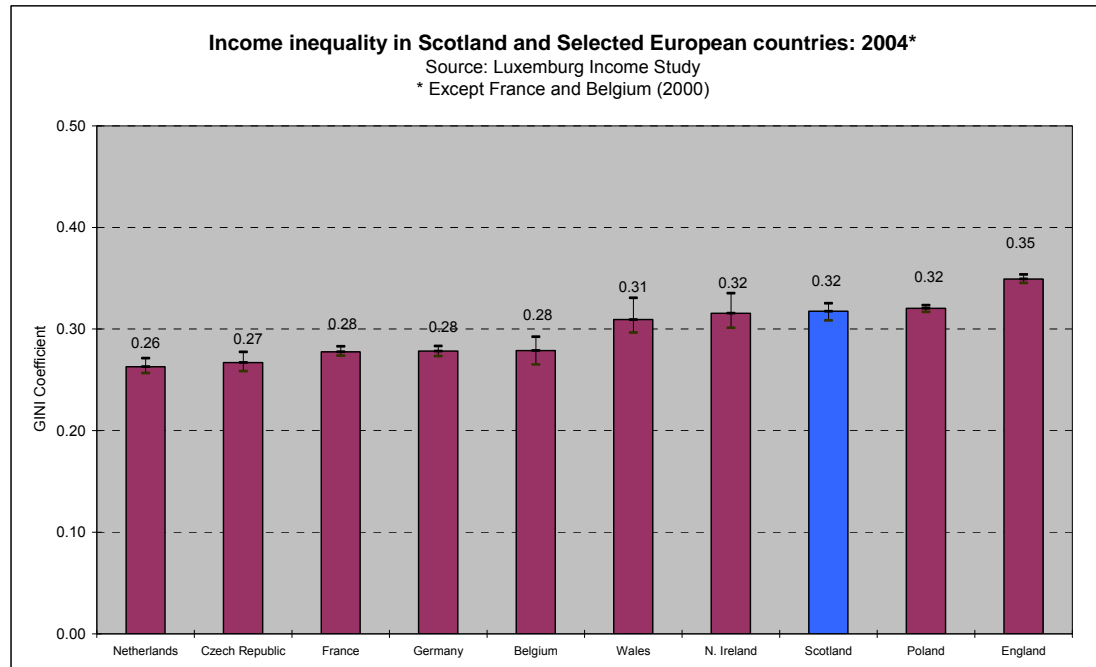
Levels of income inequality in Scotland can also be considered relative to East European nations (again, based on EU-SILC data). In 2005, the Scottish Gini coefficient was lower than the Baltic Statesⁱⁱⁱ, similar to Croatia and Romania, but higher than Slovakia, Slovenia, Bulgaria and Hungary.

Figure 3.39 approaches the issue in a different way, confining the analysis to the 'parent' countries of the post-industrial regions discussed in this report. Levels of income inequality in Scotland were significantly higher than those reported for every relevant mainland European country except Poland. There was little difference in income inequality between Scotland, Wales and Northern Ireland, although all three Celtic nations had lower levels of

ⁱⁱⁱ Latvia, Lithuania and Estonia.

inequality than England. This may reflect the influence of the very high levels of income inequality in Greater London and the South East of England.

Figure 3.39



Sample sizes: Netherlands=9356; Czech Republic=4351; France=10301; Germany=11290; Belgium=2080; Wales=1224; N. Ireland=1911; Scotland=4472; Poland=32146; England=20125.

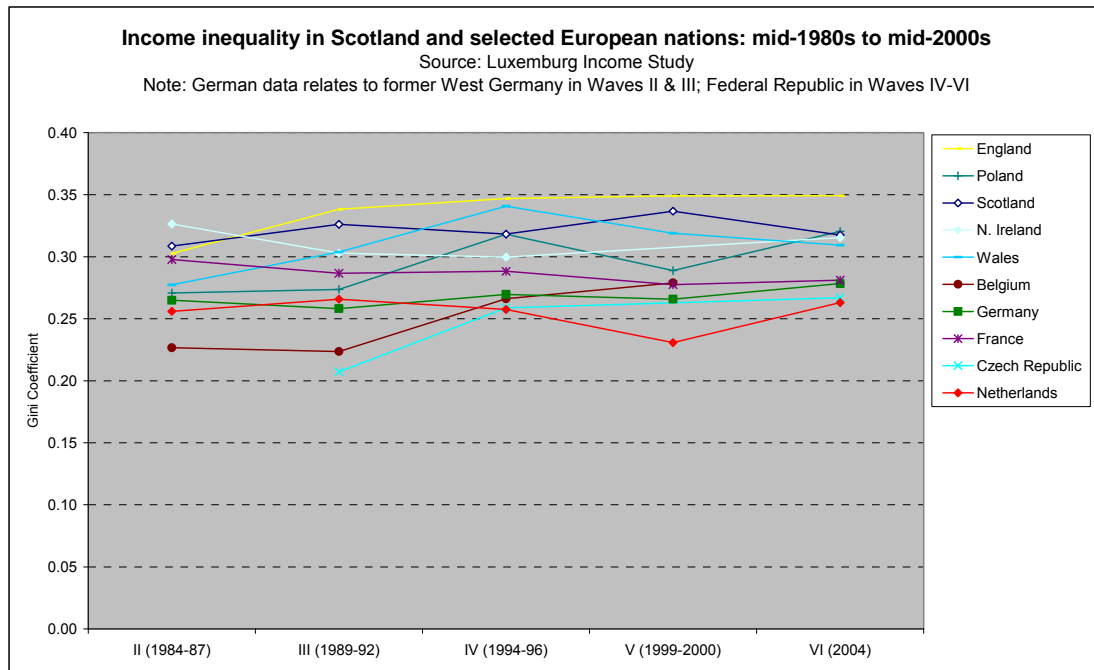
National comparisons II: Trends over time

Figure 3.40 tracks income inequality in ten post-industrial European nations, including Scotland, between the mid-1980s and 2004. It suggests that:

- Most of the nations saw income inequality increase between the mid-1980s and 2004. The exceptions were France (where the Gini coefficient fell slightly) and the Netherlands (where it fluctuated without much overall change).
- The 'rank order' of countries by income inequality changed little between the mid-1980s and 2004. The UK nations maintained the highest levels of income inequality over time, while the Benelux countries and the Czech Republic had the lowest. France, Germany and Poland remained in the middle of the ranking.
- Income inequality in Scotland was consistently higher than all the mainland European nations except Poland throughout the period.

- Levels of income inequality in Scotland, Wales and Northern Ireland were similar to each other at all four time points. Inequality in England was a little higher than the Celtic UK nations from wave III onwards (1988-92).

Figure 3.40



The context is also important. As noted elsewhere, income inequality has increased in most (though not all) middle- and upper-income countries over the last 30-40 years. It is, however, important to note that the UK was exceptional among West European nations. As shown by Nielson et al.⁷³ not only did the UK experience the sharpest increase in income inequality in Western Europe, but this polarisation was driven much more by movement from the middle to the bottom of the income distribution than by movement from the middle to the top (in other words by proportionately more households shifting to the bottom of the income distribution than shifted to the top). Furthermore, Brewer et al.⁷⁴ demonstrate that growth in inequality and the levels of inequality experienced at any point in time in Scotland was very similar to other UK regions outside of London.

Regional analysis

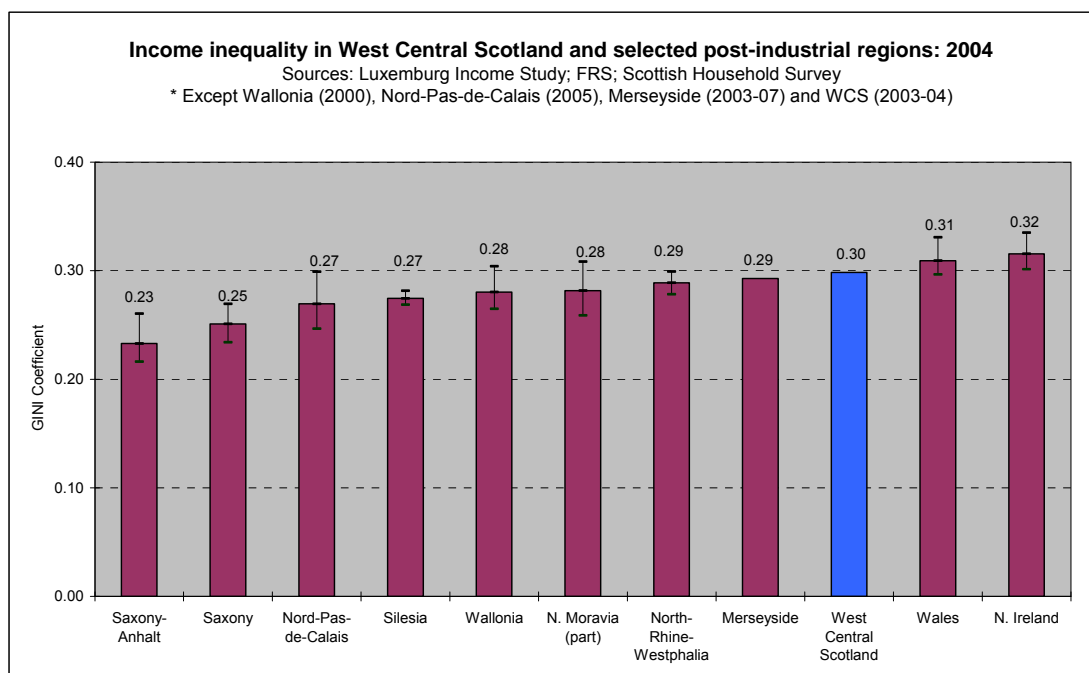
It was also possible to calculate income inequality measured by the Gini coefficient for eleven regions (Limburg is excluded as no regional breakdown was available for the Netherlands). The sources used were: the LIS database for the mainland European regions, N. Ireland and Wales; the Family Resources Survey (Merseyside) and the Scottish Household Survey (WCS). In all cases the same LIS methodology was employed to calculate the coefficients. Note that due to data limitations, 95% confidence intervals could not be calculated for WCS and Merseyside^{liii}.

Figure 3.41 shows the results of this analysis. Around 2004^{liv}, income inequalities were greatest in the four UK regions. The estimated Gini coefficient for West Central Scotland was 0.30, which was substantially higher than the figures for the Polish and East German regions.

^{liii} It should be noted, however, that 95% confidence intervals for WCS are likely to be very narrow, given the large sample size of over 11,000.

^{liv} Data are from 2004 with the exceptions of: Wallonia (2000), Nord-Pas-de-Calais (2005), Merseyside (2003-07) and WCS (2003-04).

Figure 3.41

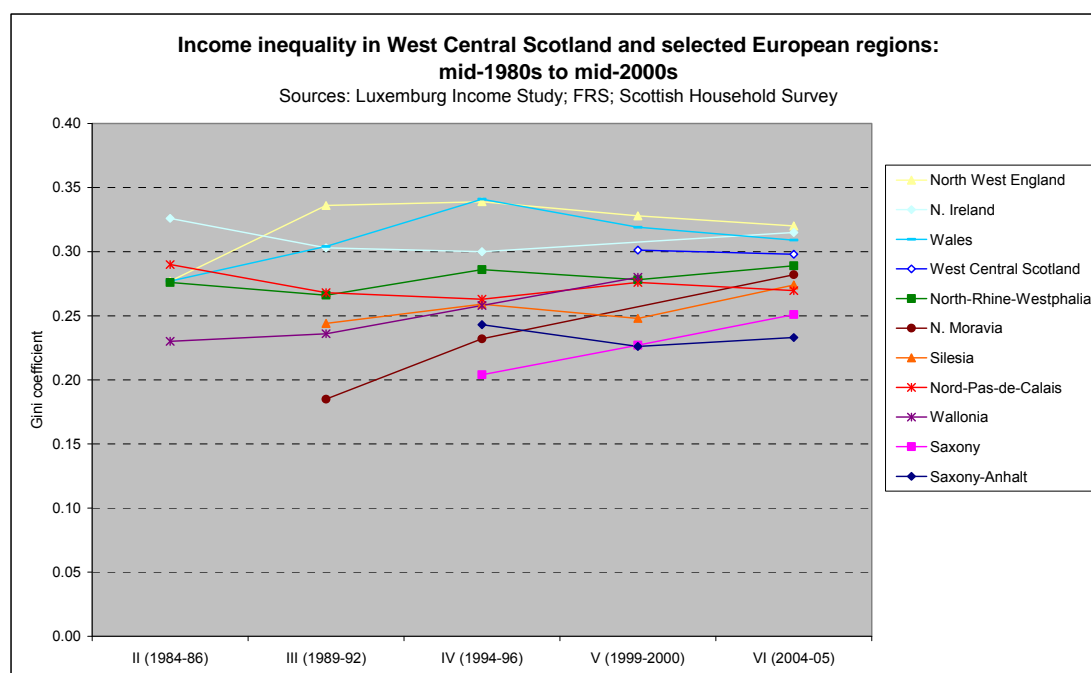


Sample sizes: Saxony-Anhalt=473; Saxony=818; Silesia=4237; Nord-Pas-de-Calais=675; Wallonia=676; N. Moravia (part)=602; North-Rhine-Westphalia=2379; Merseyside=692; Wales=1224; N. Ireland=1911; West Central Scotland=11030. Note: N. Moravia (part) relates to the 'kraj' of Moravskoslezský^{iv}. North-Rhine-Westphalia used as a proxy for the Ruhr. Wales used as a proxy for S. Wales coalfields. Note that due to data limitations, 95% confidence intervals could not be calculated for WCS and Merseyside.

Time trends analysis suggests income inequality in WCS has been high relative to other mainland European regions since at least 1999-2000 (Figure 3.42). It is likely that it was also higher for much of the 1980s and 1990s, given that that is true of other relevant parts of the UK.

^{iv} See N. Moravia Case Study report for more details.

Figure 3.42



Note: Silesia data relate to S. Poland (Wave III), Katowice region (Wave IV) and Silesia (waves V and VI). North West England used as proxy for Merseyside. North-Rhine-Westphalia used as a proxy for the Ruhr. Wales used as a proxy for S. Wales coalfields. Northern Moravia defined as the full region in 1989-92 and 1994-96, and Moravskoslezský only in 2004.

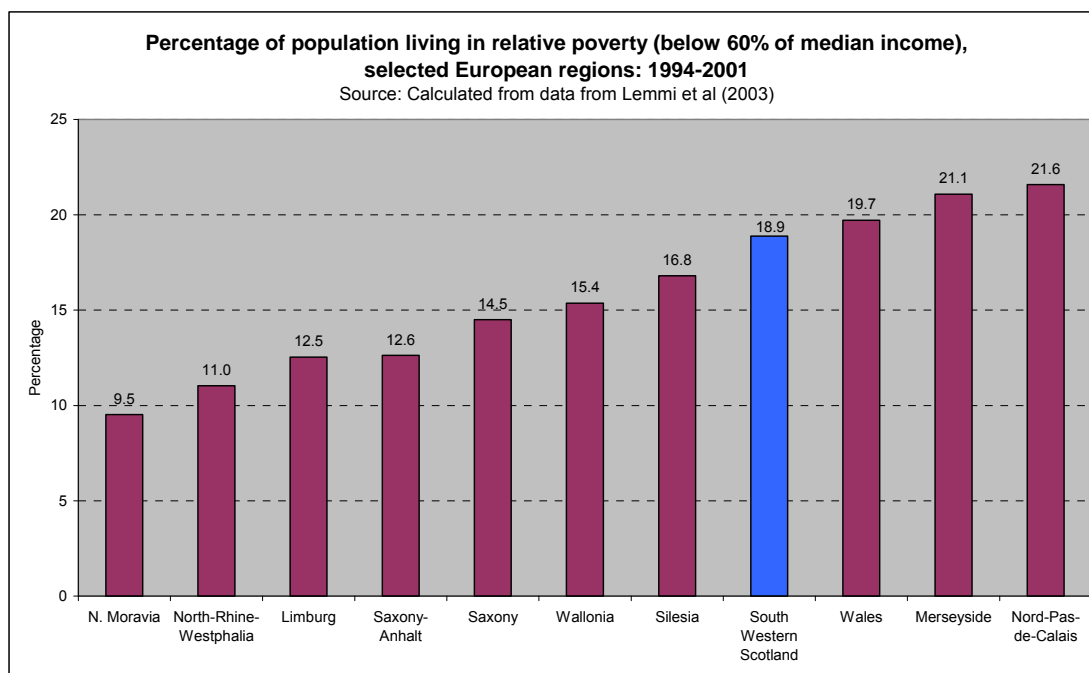
Relative poverty

In the European Union, poverty is usually measured in relative terms: that is, showing income levels relative to national income standards. The most common indicator used is the percentage of people living in households with an income less than 60% of the median income. Lemmi et al⁷⁵ have published methods and data that can be used to estimate relative poverty rates for a large number of NUTS II regions, averaged over the period 1994-2001. Figure 3.43 below shows estimates of the population living in relative poverty across eleven European regions. South West Scotland is used here as a proxy for WCS.

Relative poverty is high in South Western Scotland compared to the Benelux, German and East European regions, but not compared to the GB areas and Nord-Pas-de-Calais.

However, note that as the data cover a seven year period (1994-2001) measures of relative poverty may well have fluctuated, especially in Eastern European regions.

Figure 3.43^{lvi}



Sample sizes: NRW=2164; Saxony-Anhalt=586; Saxony=396; Wallonia=10490; Silesia=563; South Western Scotland=1279; Wales=2090; Merseyside=844; Nord-Pas-de-Calais= 3125. Sample sizes not available for N. Moravia or Limburg.

^{lvi} Note: this figure shows the percentage of the population living with an income that is below 60% of the median income of the parent country, not the region.



CASE STUDY: SPATIAL POLARISATION IN UK POST-INDUSTRIAL REGIONS

The final aspect of inequality considered here is spatial inequality in wealth and poverty. One way to examine this is through the 'index of dissimilarity'.

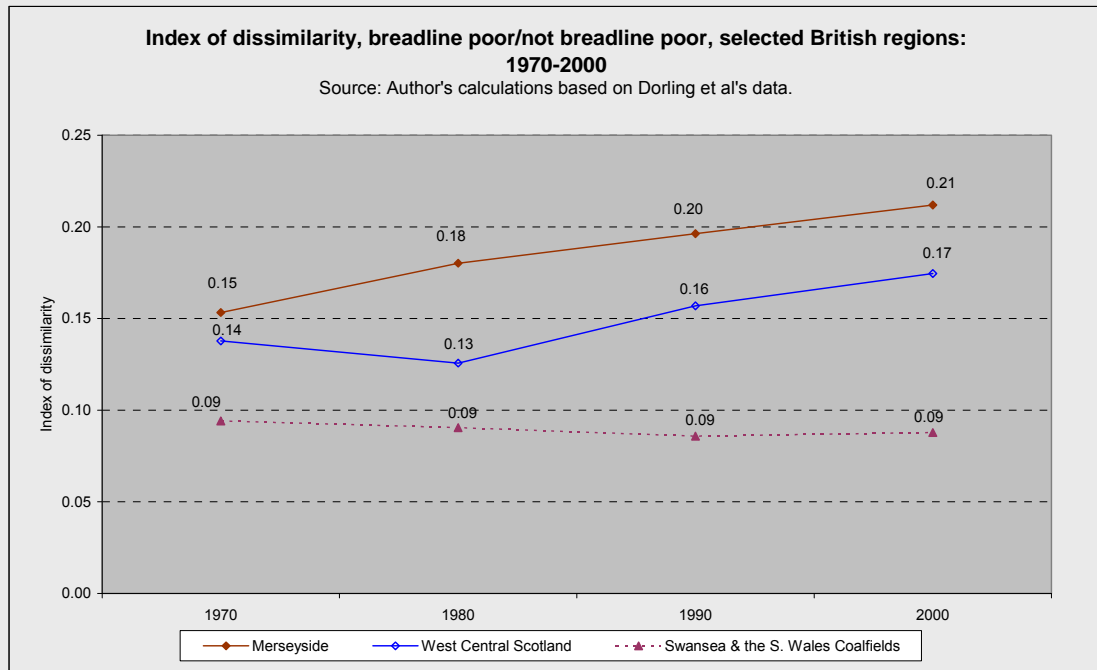
Originally developed by Duncan and Duncan⁷⁶ to study racial segregation in US cities, the index of dissimilarity measures how evenly two groups are distributed across small areas that make up a larger geography.^{lvii} For example, if we had two groups – poor and non-poor – the index would indicate what proportion of each group would have to move geographically to produce an even distribution of poor and non-poor across all areas. Scored between zero and one, higher scores on the index indicate greater spatial dissimilarity (and thus, in the example above, greater geographical segregation of the poor and non-poor). Here the index of dissimilarity is applied to Dorling et al's⁷⁷ estimates of the number of people who were classed as being 'breadline poor'^{lviii} in three UK regions (WCS, Merseyside and Swansea & the South Wales Coalfields (S&SWCs)) between 1970 and 2005 compared to those who were not.

Results are presented in Figure 3.44. This shows that Merseyside had the highest index of dissimilarity for breadline poverty over time and the Welsh region the lowest, with WCS between the two. Furthermore, levels of spatial polarisation into 'breadline poor' and 'not breadline poor' areas increased over time in Merseyside and West Central Scotland, but were stable in S&SWCs.

^{lvii} See Appendix A for the formula used to calculate the Index.

^{lviii} 'Breadline poor' include all those whose income was below 70% of median income. It also includes the 'core poor' (defined as those breadline poor who were also materially deprived (could not afford certain material assets, holidays or were in rent/mortgage arrears) and considered their household to be poor 'sometimes' or 'all the time'. Further details are available in Appendix A.

Figure 3.44



This suggests that the spatial polarisation of poverty is not uniquely high in West Central Scotland, and that this is not a strong candidate explanation for the slower improvement in life expectancy seen in the region.

Summary: Income inequality, relative poverty and spatial segregation

- At the national level, **income inequality** in Scotland is high in European terms (although it is comparable to that seen in – for example – Ireland, Northern Ireland and, Wales, and it is lower than in England). Trend data show that it has been higher in Scotland than in Germany, France, Belgium, the Netherlands and the Czech Republic since the early 1980s, but lower than in England, and similar to Wales, Poland and Northern Ireland, at least since the mid-1990s.
- At the regional level, levels of income inequality in WCS are high compared to all the mainland European post-industrial regions; this is especially true in relation to the East German regions. However, levels are similar to the other UK post-industrial regions.
- These higher levels of income inequality feed through into high levels of **relative poverty**. Based on data from 1994-2001, relative poverty in WCS was high compared to levels found in the East European, German and Benelux regions (but similar to levels observed in Nord-Pas-de-Calais, Merseyside and Wales).
- However, **spatial inequalities in poverty** in WCS appear to be lower than in Merseyside.

3.5 Population: births, deaths, composition and migration

Introduction

Demographic factors (e.g. the age and sex structure of the population, rate of reproduction and migration) can both influence, and be influenced by, population health. For example, selective migration away from economically depressed regions by the younger and healthier might lead to deterioration in levels of health in these areas relative to more prosperous parts of the country^{lix}. In this section we compare some key population indicators – gender ratio, dependency ratio, population density and fertility rates – to see if any important differences emerge in relation to the profile and experience of WCS compared to the other post-industrial regions of interest.

Gender ratio

Gender imbalances can have negative consequences for population health. Research has suggested that unequal gender ratios can impact on health in a number of ways: for example, where men outnumber women this can result in lower marriage rates and the loss of ‘protective’ factors associated with marriage^{78, 79, 80 81, 82, 83}. This section will focus on gender imbalances among working-age adults (aged 15-64), using the gender ratio defined as simply the number of males in the population divided by the number of females.

Figure 3.45 shows that among younger working-age adults (15-44) the majority of the post-industrial regions, including WCS, do not have an equal proportion of men and women in their populations. This is particularly true of Saxony and Saxony-Anhalt (more young males than young females, possibly reflecting the impact of migration⁸⁴), and also of WCS and Merseyside (more young females than young males).

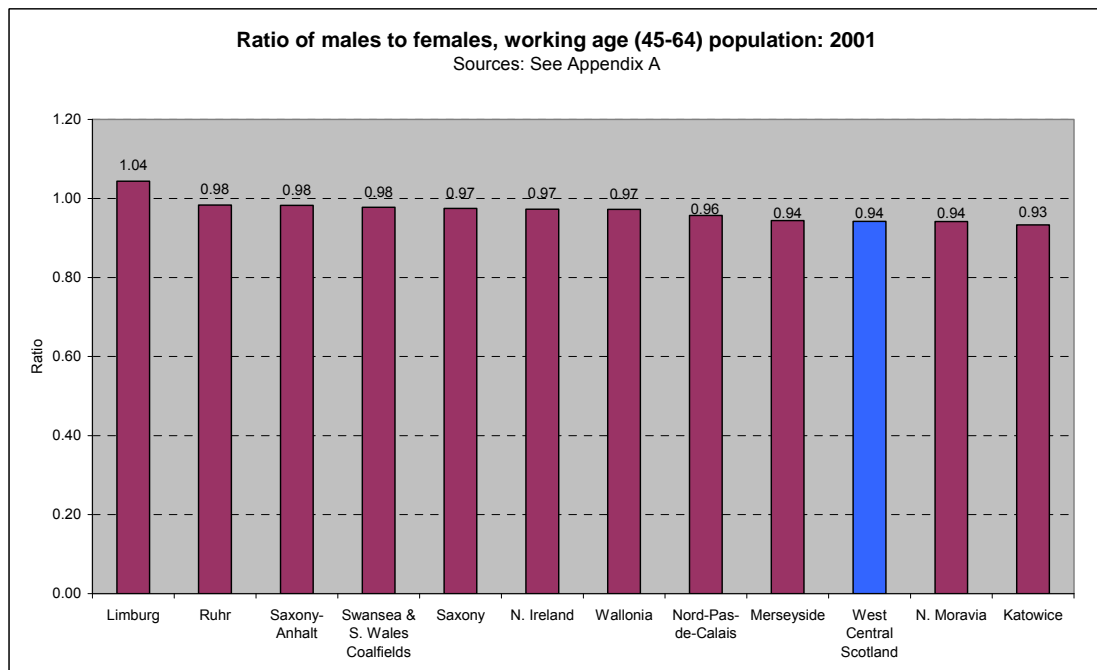
^{lix} Note, however – and as is discussed later in this report – the scale at which this so-called ‘healthy migrant’ effect impacts on health is much debated. It is further complicated by the fact that some of the regions which have shown the greatest *increase* in life expectancy (e.g. Saxony in the former East Germany) have also experienced considerable levels of emigration from among the younger (and healthier) population.

Figure 3.45



Figure 3.46 shows that among older working-age adults (45-64), females outnumbered males in every region except Limburg, where the reverse was true. The ratio of males: females in WCS was similar to that found in Nord-Pas-de-Calais, Merseyside, Northern Moravia and Katowice.

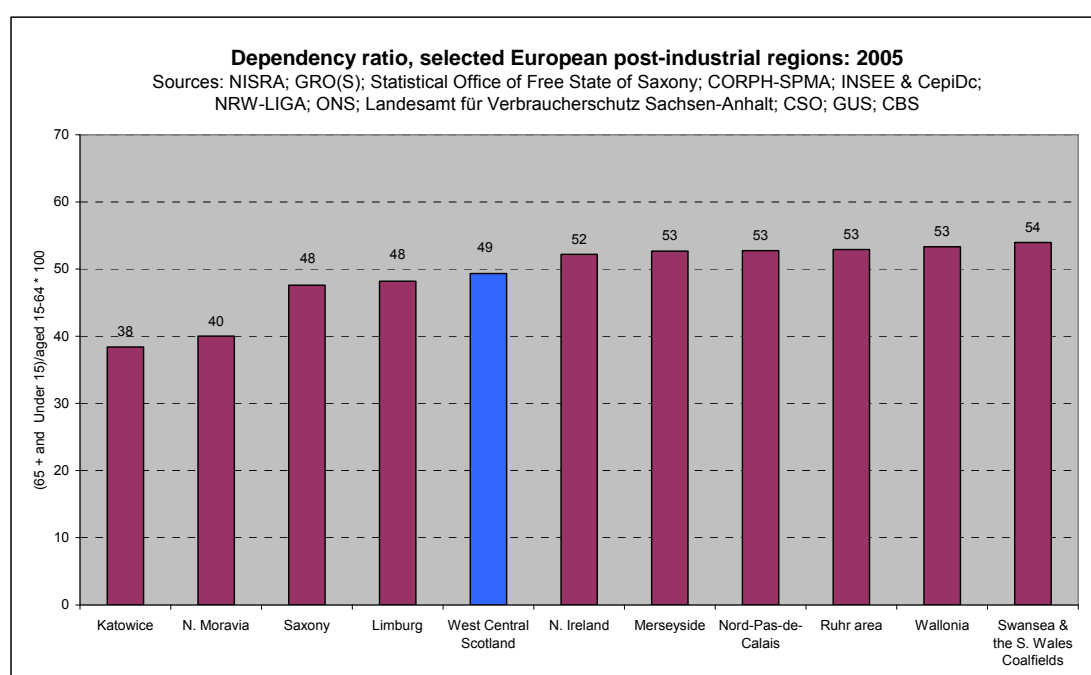
Figure 3.46



Dependency ratio

The 'dependency ratio' (crudely defined as the ratio of the 'economically dependent' population (i.e. the young and old) to the working-age population) is an important economic and demographic indicator for countries, regions and cities^{ix}. In 2005, the dependency ratio in WCS was 49%, similar to that seen in Saxony and Limburg. Most regions had dependency ratios a little higher than this (between 52% and 54%). Katowice and Northern Moravia stand out as having especially low dependency ratios (Figure 3.47).

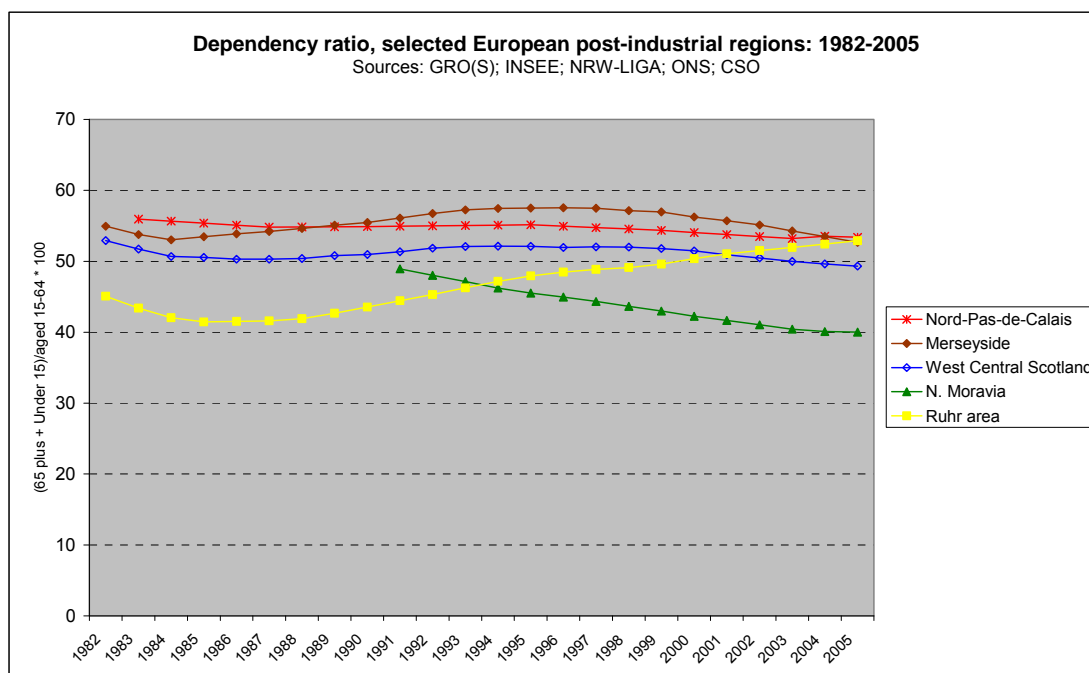
Figure 3.47



Time trends in regional dependency ratios show that while some regions had rising dependency ratios (the Ruhr) and others dramatic falls (Northern Moravia), WCS's dependency ratio fluctuated without substantial change (Figure 3.48).

^{ix} Here it is calculated as the population aged 0-14 and 65+ divided by the population aged 15-64, and multiplied by 100.

Figure 3.48



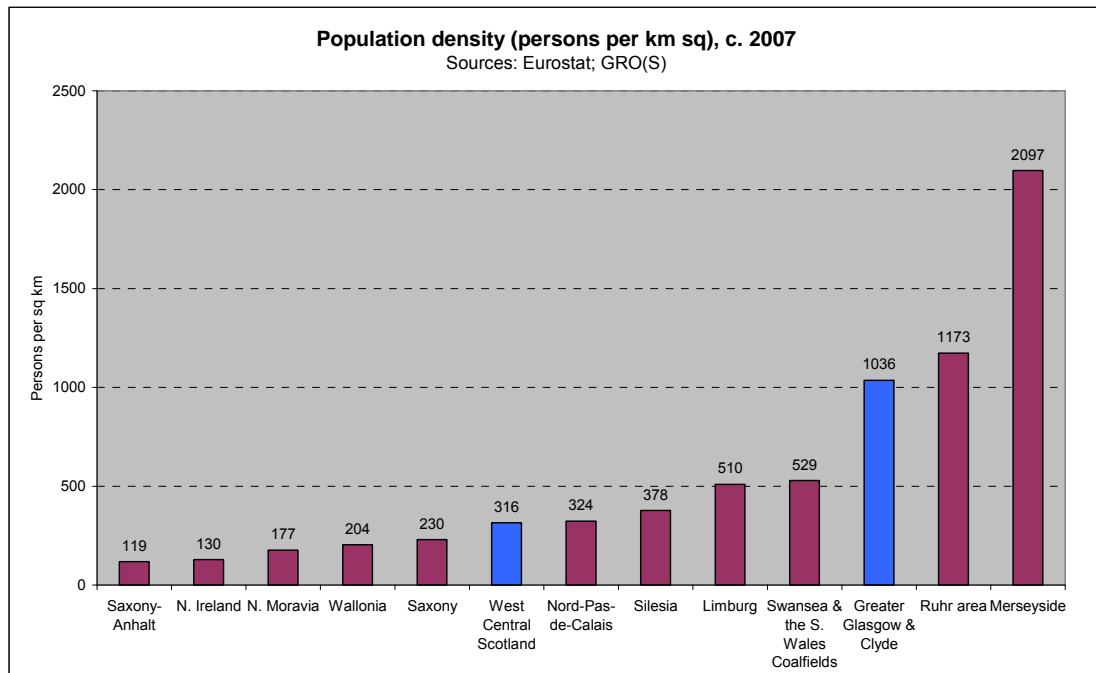
Population density

Population density is used here principally to assess the comparability of the regions. However, it has also been shown to be associated with particular health outcomes – for example within developed Western countries, higher population densities are associated with higher mortality from cancer (especially for men)⁸⁵. Within Scotland, suicide rates for men have been shown to be highest in the most and least densely populated parts of the country⁸⁶.

Figure 3.49 shows the population density (number of people per km²) across all regions of interest in 2007. The Greater Glasgow & Clyde area is shown as well as the overall WCS region. The level of population density for WCS (316 people per km²) was very similar to that seen in Nord-Pas-de-Calais (324 people per km²).

Greater Glasgow & Clyde has a much higher density than the broader WCS region – 1036 people per km² – placing it closer to the Ruhr area. But it is also apparent that the very highest levels of population density (by some margin) were found on Merseyside^{lxi}

Figure 3.49



^{lxi} Note that at a sub-regional level, in 2006, Glasgow had a population density of 3,308 people per km², higher than the rates for the largest cities in every region except Liverpool in Merseyside (3963 people per km²) and Lille in Nord-Pas-de-Calais (5,720 people per km²).

Population change

The first 'Aftershock' report highlighted differences in population trends over a 20-25 year period across the regions. While trends were mostly flat in the regions, there were exceptions:

- Between 1982 and 2005, WCS and Merseyside saw their populations decrease by 8% and 9% respectively.
- Northern Ireland's population increased by 10% over the same period.
- The population of the Ruhr area fell in the early 1980s, grew strongly until the mid-1990s and has declined steadily ever since.
- Saxony saw its population decline slowly in the 1980s and then reduce much more steeply in the 1990s: its loss of population was much more marked than that observed in WCS.

Thus different trends in population change are seen across the different regions. This is outlined further below, and in Part Four of the report we discuss the extent to which migration may impact on WCS mortality levels.

Population change as a marker of growth and decline

A detailed analysis of population change over 45 years (1960-2005) in over 300 European cities/urban conurbations was undertaken recently by Turok and Mykhnenko^{87, 88}. The authors explicitly associated population change with 'economic dynamism' and 'social vitality'. In these terms they characterised each conurbation in terms of a nine-point scale of growth/decline. The categories were:

1. Continuous decline
2. Long-term decline
3. Medium-term decline
4. Recent decline
5. Growth set-back
6. Recent resurgence
7. Medium-term resurgence
8. Long-term resurgence
9. Continuous growth.

It was notable that of the 300 areas analysed, only five were classed as being in *continuous decline* and, of these, four were included in the original list of post-industrial regions in the first 'Aftershock' report: Greater Glasgow, Merseyside/Liverpool, Tyne & Wear, and Greater Leipzig (in (Eastern) Germany)^{lxii}. Furthermore, a further four of the eight areas classed as being in *long-term decline* were also identified as being located within post-industrial European regions in the first 'Aftershock' report: Lens in Nord-Pas-de-Calais in France; the Ruhr District in Germany; Chemnitz in Saxony and Magdeburg in Saxony-Anhalt. Only one city was classed as having experienced *continuous growth*: Greater Lille in Nord-Pas-de-Calais (although a small number were associated with some recent resurgence in population (and, by implication, economic prospects): Charleloi and Liege in Wallonia in Belgium; Greater Manchester and the Greater Birmingham in England; and Greater Belfast in Northern Ireland).

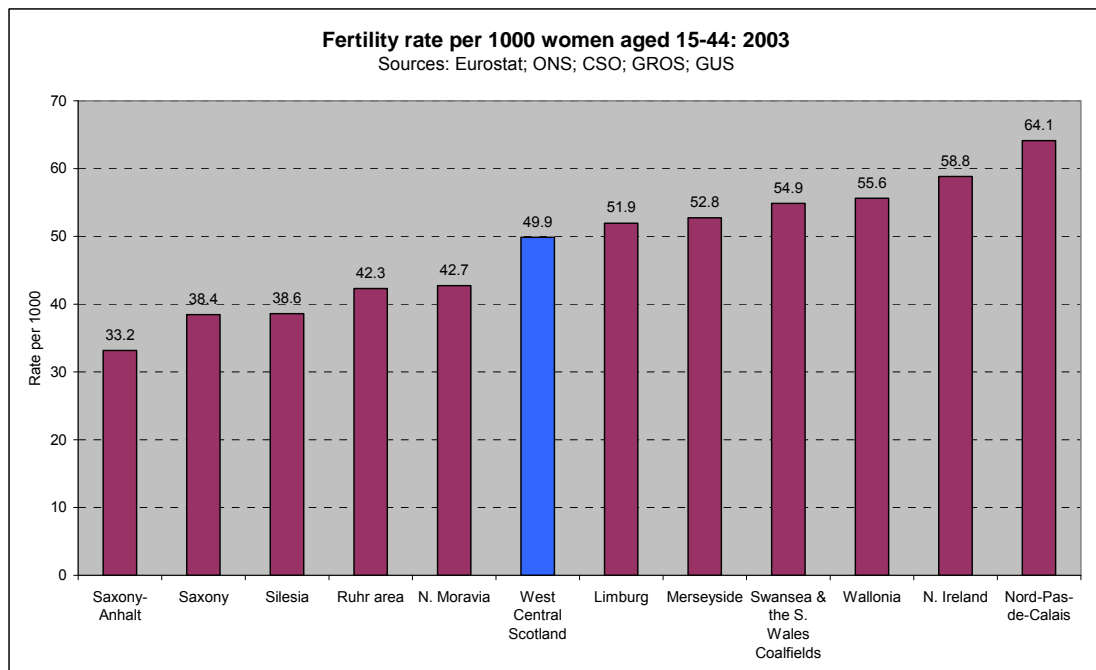
This analysis reaffirms some of the important issues faced by post-industrial areas, but also highlights that some of these areas have experienced levels of recovery. We return to this theme in Part Four.

^{lxii} Note that the fifth area – Wuppertal in Germany – is located just a few miles south of the Ruhr area of Germany (also one of our regions of interest).

Fertility rate

Figure 3.50 shows that in 2003 the fertility rate (expressed as the number of live births per 1000 women aged 15-44) in WCS was 49.9 per 1000. This was low compared to most West European and UK regions, but high relative to the German and East European regions. The lower fertility rates in the East German regions may partly reflect the shortage of younger working-age females in these regions.

Figure 3.50



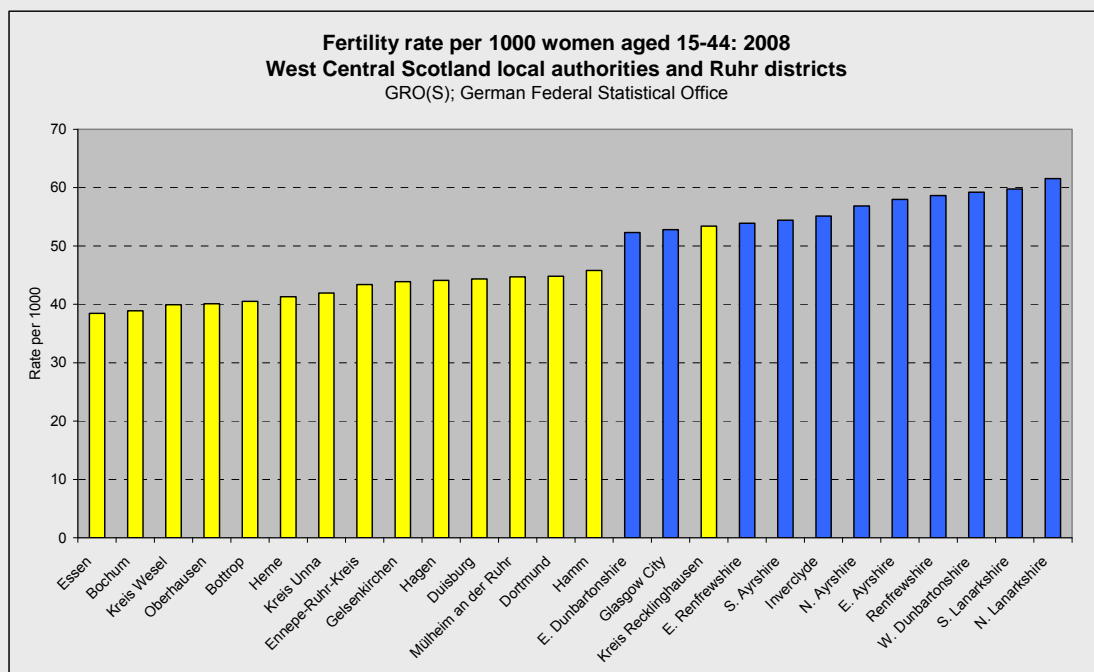
Note: All data 2003 except Limburg (2001) and Silesia (2004).



CASE STUDY – THE RUHR: fertility rates

The analysis above reveals the higher fertility rates in WCS compared to the Ruhr area. Here we examine these data at a sub-regional level, in the 15 districts (*kreise*) of the Ruhr area and the 11 WCS local authorities (Figure 3.51). This clearly shows that the overall higher rate seen in WCS compared to the Ruhr is also true of both regions' smaller areas. Except for Recklinghausen, none of the Ruhr kreise had a fertility rate as high as any of WCS local authorities.

Figure 3.51



Summary: Population

- More than half the regions, including WCS, have a **gender** imbalance in their young adult population. WCS and Merseyside have more females than males in this age group, while Saxony and Saxony-Anhalt have more males than females.
- Every region except Limburg has more females than males in its population aged 45-64. WCS has a similar gender ratio in this age group to four other regions.
- **Population density** in Merseyside is considerably higher than in all the other regions.
- Between 1981 and 2005, the **dependency ratio** in West Central Scotland remained substantially unchanged. This contrasts with areas such as the Ruhr and Northern Moravia, which saw considerable changes in this figure over time.
- **Fertility rates** in West Central Scotland were high compared to the German and East European regions but low compared to all other West European regions.
- **Migration** patterns in WCS, Merseyside and the German regions differed from the other regions, with the Ruhr, Saxony, WCS and Merseyside all seeing population decline over the period.

3.6 The ‘social environment’: education, households and social capital

Introduction

Family structures and relationships, collective beliefs about society and how education is organised can both reflect and influence population health. These aspects of the ‘social environment’ also interact with the physical environment, health behaviours and economic factors to influence health outcomes. This section looks at a range of indicators of the social environment, covering educational attainment, household structure, marital status and some common indicators of social capital, to assess whether, and to what degree, WCS differs from other post-industrial regions in relation to this important topic.

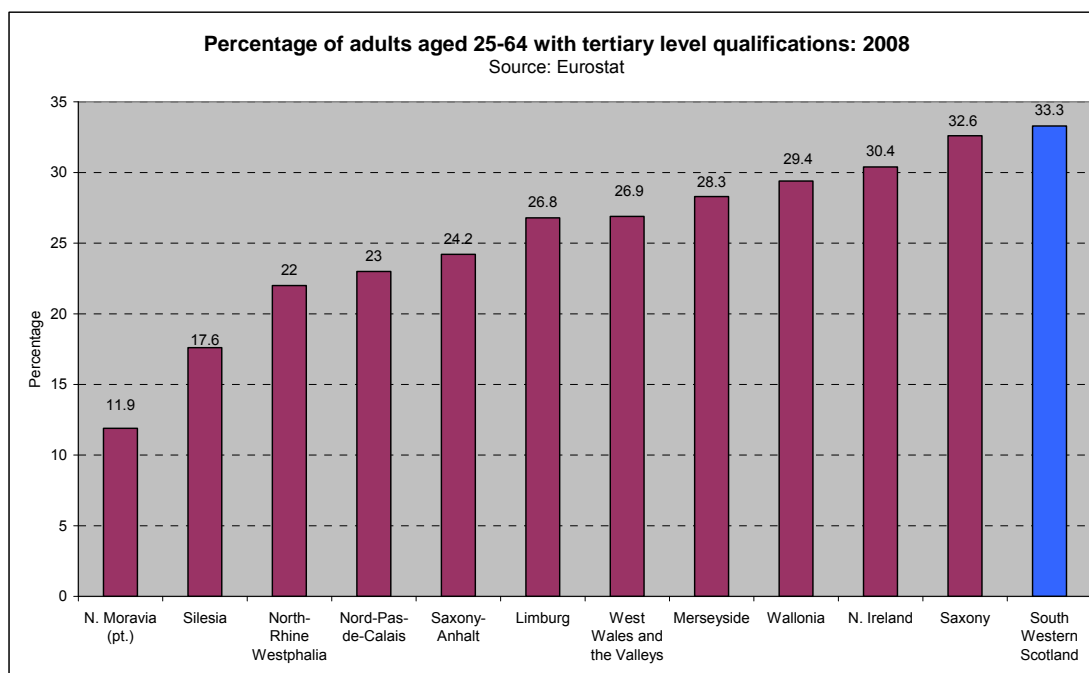
Education

The link between educational attainment and population health is well established.^{89, 90, 91, 92, 93, 94, 95} Relative to other countries and regions, Scotland, and WCS in particular, compares well in terms of some aspects of educational attainment, but not all. For example, as noted in the first ‘*Aftershock*’ report, S.W. Scotland (as a proxy for WCS) has a relatively high proportion of adults educated to tertiary level. Similar, but updated, data are shown in Figure 3.52. In 2008, a third (33.3%) of the region’s adult population aged 25-64 held ISCED^{lxiii} tertiary level qualifications^{lxiv}, higher than the levels reported for most other regions except Saxony.

^{lxiii} ISCED is the International Standard Classification of Education, a means of classifying and comparing international education statistics.

^{lxiv} These include university degree or NVQ level 4/5 level qualifications and above.

Figure 3.52

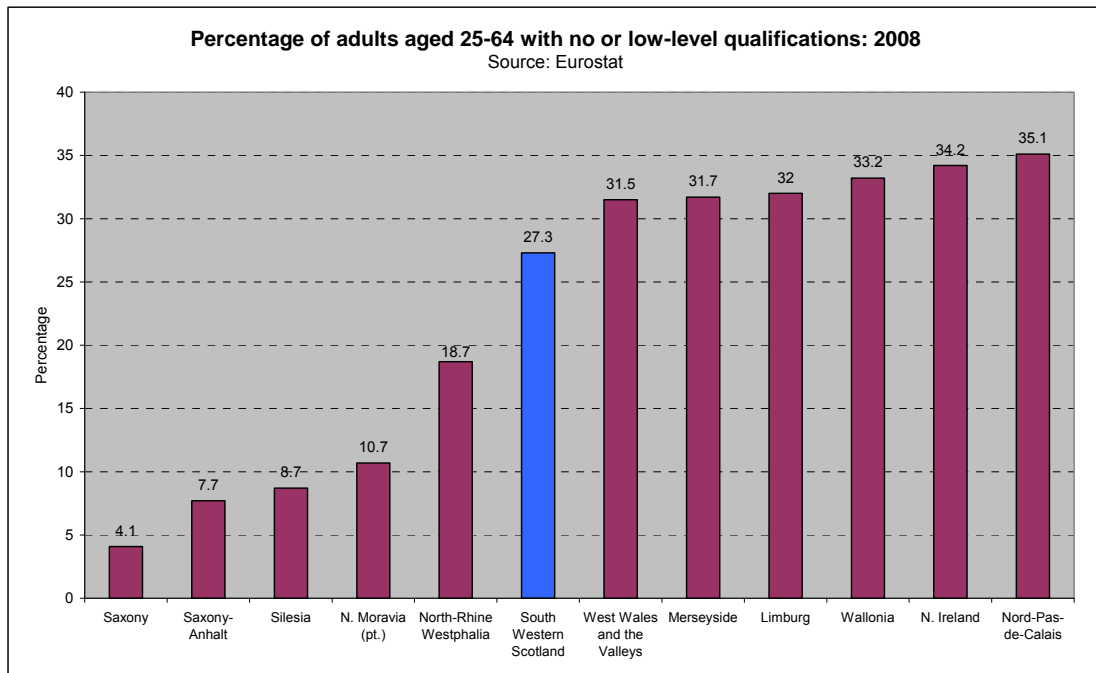


Note: S.W. Scotland used as proxy for WCS. N. Moravia (pt.) figure based on Moravskoslezsko region. North-Rhine Westphalia used as proxy for The Ruhr. West Wales and the Valleys used as proxy for Swansea & S. Wales Coalfields

However, at the other end of the spectrum, more than a quarter (27.3%) of adults aged 25-64 in South Western Scotland had either no, or low-level, qualifications^{lxv} (Figure 3.53). This was high compared to Silesia, Northern Moravia and the German regions, and only marginally below the levels reported for other West European areas.

^{lxv} ISCED < Level 3: Pre-primary, primary education; key skills/basic skills/entry level qualification/YTP certificate/no qualification

Figure 3.53



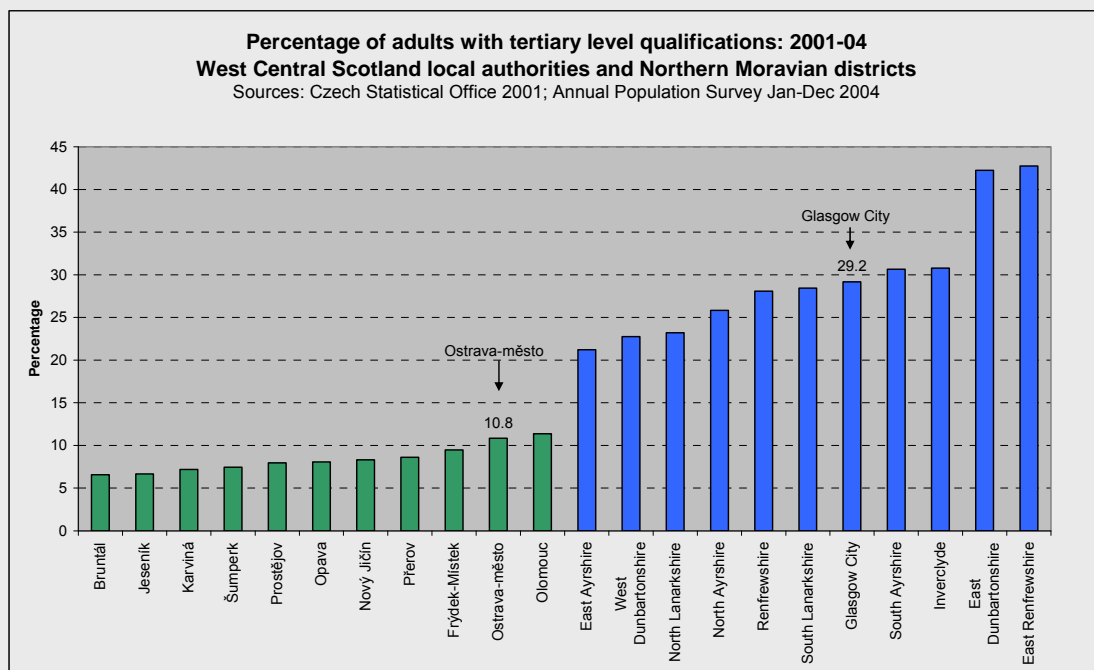
Note: S.W. Scotland used as proxy for WCS. N. Moravia (pt.) figure based on Moravskoslezsko region. North-Rhine Westphalia used as proxy for The Ruhr. West Wales and the Valleys used as proxy for Swansea & S. Wales Coalfields



CASE STUDY – NORTHERN MORAVIA: Educational attainment

More in-depth regional comparisons of tertiary qualifications show that high levels of qualification are much more common in, and across, WCS than in Northern Moravia. For example, Figure 3.54 shows that Glasgow City had three times the percentage of adults qualified to this level than in Ostrava-město district.

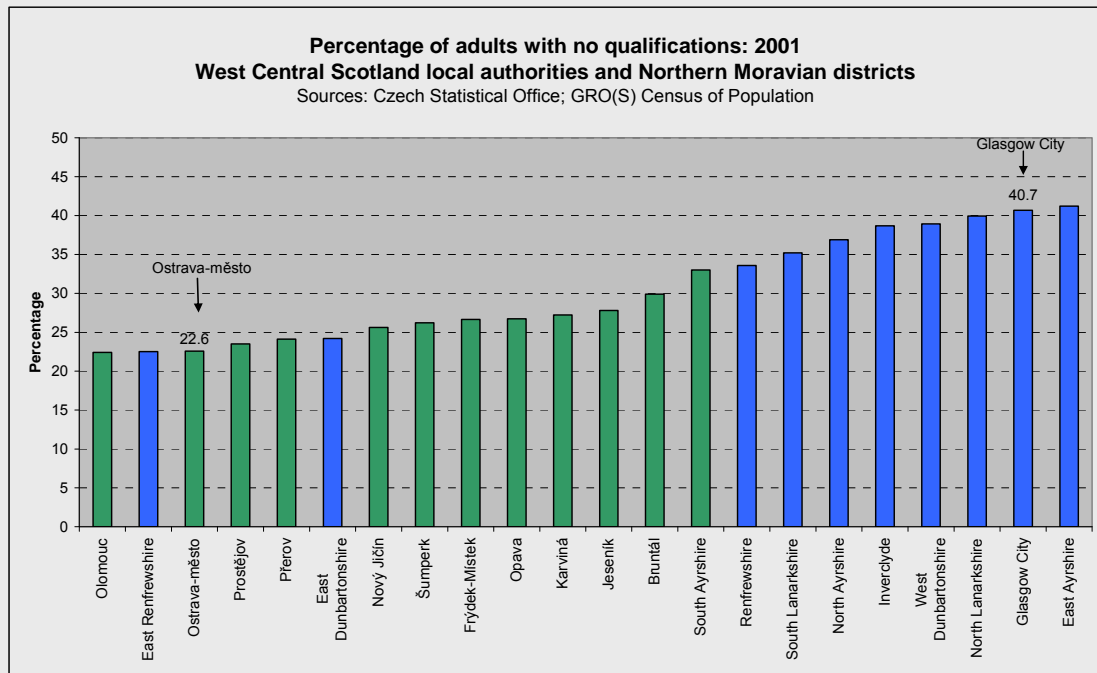
Figure 3.54



Note: Adults aged 15+ in N. Moravia and aged 16-64 in WCS. The percentage of WCS adults aged 16+ with tertiary level qualifications is likely to be a few percentage points lower.

However Figure 3.55 also shows that across Northern Moravia, the percentage of adults with no qualifications was lower than almost every local authority in WCS. Only the two most affluent WCS local authorities (East Dunbartonshire and East Renfrewshire) could match the levels in the Czech region. By way of illustration, the percentage of adults with no qualifications in Glasgow City (the largest area of WCS) was almost twice as high as the levels observed in Ostrava-město (the largest area of Northern Moravia).

Figure 3.55



Note: Adults aged 15+ in N. Moravia and aged 16-74 in WCS.

Lone parent households

At a population level, 'vulnerable' households such as lone parent households have been shown to be associated with a number of adverse social and health related factors^{96 97}. Figure 3.56 shows that in 2001, close to a third of WCS households with children (31.1%) were headed by a lone parent^{lxvi}. This figure is high compared to most of the other post-industrial regions: WCS, the Ruhr and Merseyside are notable in this respect. At the other end of the spectrum, Limburg and Silesia have a very low percentage of lone parent households.

As with single person households, the proportion of lone parent households with dependent children increased in European post-industrial regions between 1990 and 2001 (Figure 3.57). Note that this definition focuses on households where the children were presumed to be financially dependent on their parent(s)^{lxvii}. Rates in Merseyside and WCS were high in 1991 and rose further to overtake the Ruhr by 2001. The percentage of lone parent households increased at a faster rate in WCS than the other European regions, but not relative to Merseyside.

^{lxvi} Note that this definition is for households with any children (regardless of whether they were economically dependent on their parents or not). The percentage of lone parent households with dependent children as a percentage of all households with dependent children was slightly lower, at 28.5%.

^{lxvii} However, this definition differs slightly for Northern Moravia and Nord-Pas-de-Calais. For these regions, children are assumed to be financially dependent on their parents if they are still in full-time education up to the age of 25. More detailed definitions are available in Appendix A.

Figure 3.56

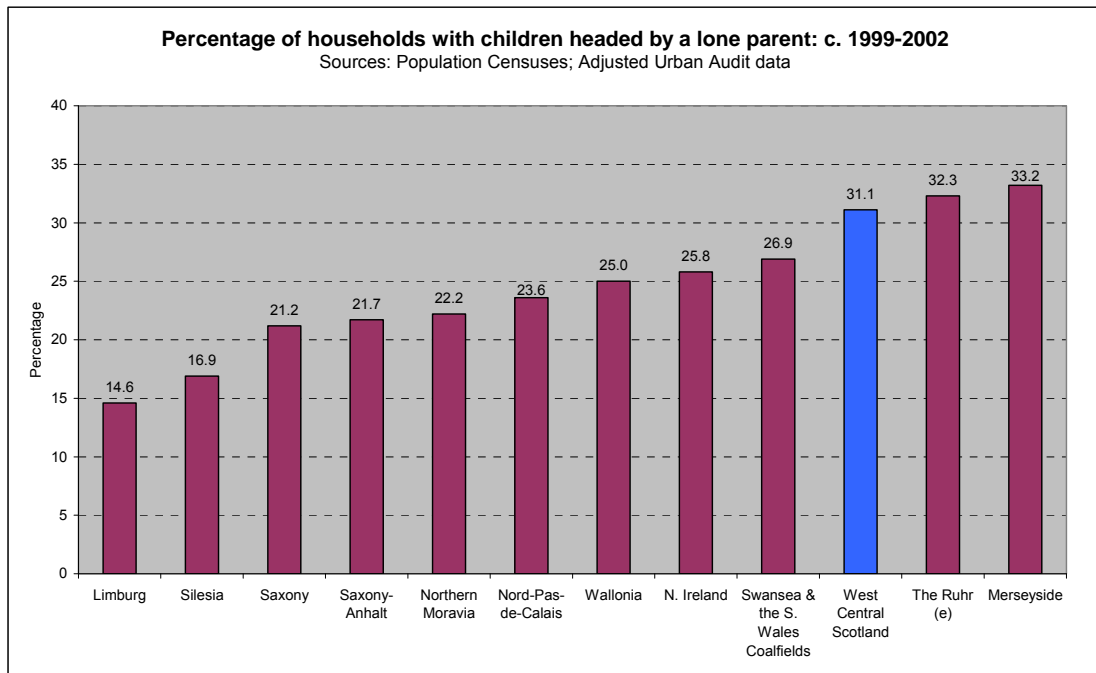
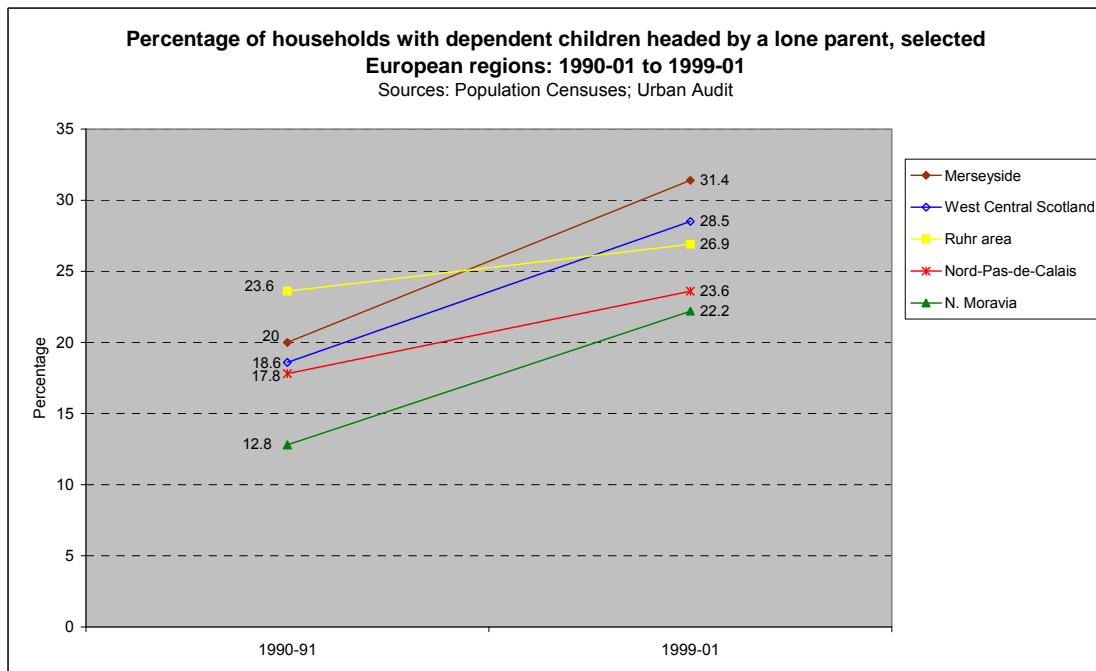


Figure 3.57





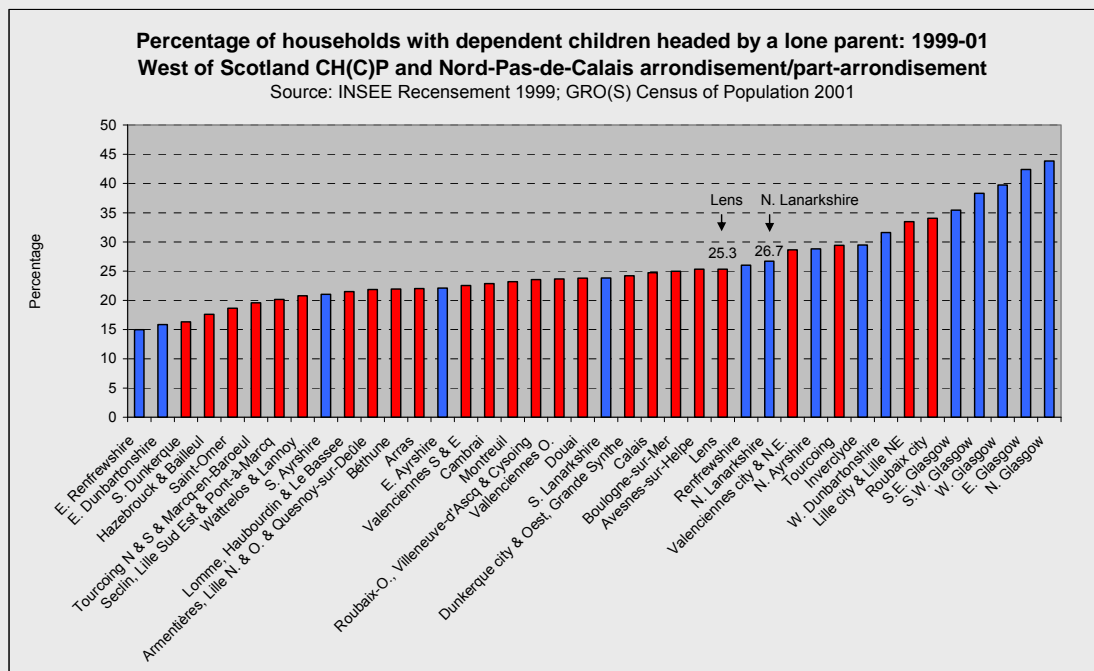
CASE STUDIES – NORD-PAS-DE-CALAIS AND SILESIA:

lone parent households

At a regional level, both Nord-Pas-de-Calais and Silesia have fewer lone parent households, relative to their population size, than WCS. However, sub-regional comparisons between WCS and the French and Polish areas highlight differences in the distribution of these households within regions.

As Figure 3.58 shows, most areas within WCS have a percentage of lone parent households that is similar to that seen in comparably-sized Nord-Pas-de-Calais districts. For example, the percentage of lone parent households in Lens was only marginally below levels seen in North Lanarkshire (25.3% v 26.7%)^{lxviii}. However, it is the very higher concentrations of lone parent households in Glasgow City that explain the regional ranking shown in Figure 3.56 above.

Figure 3.58

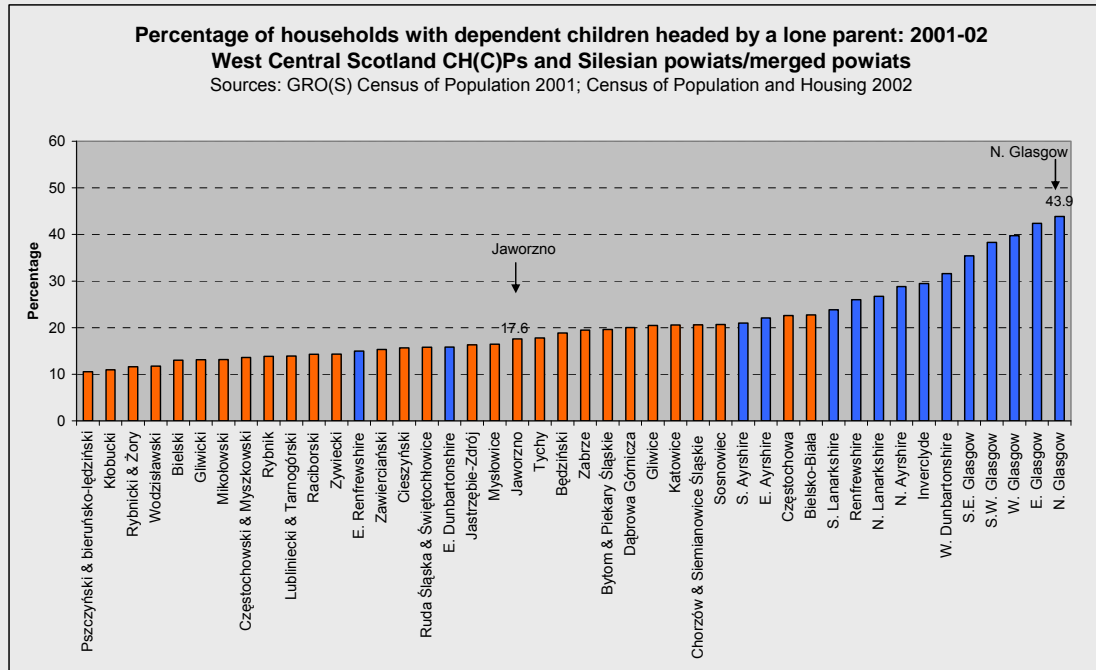


The contrast with Silesia is more striking. In 2001-02, only four of the WCS CHPs had concentrations of lone parent households that were similar to those found in Silesian *powiats* (counties). As one example, the industrial city of

^{lxviii} In 2006, Lens had a population of 322,000 while North Lanarkshire had a population of 324,000.

Jaworzno can be compared to the North of Glasgow in industrial history and population^{lxix}. However, the percentage of lone parent households was more than twice as high in the WCS sub-region (Figure 3.59).

Figure 3.59



^{lxix} In 2001-02, Jaworzno had a population of c. 95,000 and N. Glasgow a population of c. 100,000. Jaworzno's economy was built on coal-mining, chemicals and ceramics. North Glasgow had important locomotive works and glassworks factories.

Single person households

Research has shown single person households to be linked, at a whole population level, to a number of adverse outcomes. For example, areas with higher levels of people living alone are associated with higher rates of suicide⁹⁸ and poor mental health⁹⁹. Analysis of the MONICA study in Germany also found that living alone was an independent risk factor for mortality among men¹⁰⁰. Non co-habitation also increases the risk of smoking among women.¹⁰¹ Single people also tend to consume more alcohol and live less healthy lives than those living with at least one other person¹⁰².

Results of comparative analyses of single person households are shown in Figure 3.60. Just over a third (33.8%) of WCS households contained a single adult. This was a relatively high figure compared to many of the other regions, especially Silesia and Nord-Pas-de-Calais where the figure is close to one in four. However, the highest concentrations of single person households were found in Saxony and the Ruhr area.

Figure 3.60

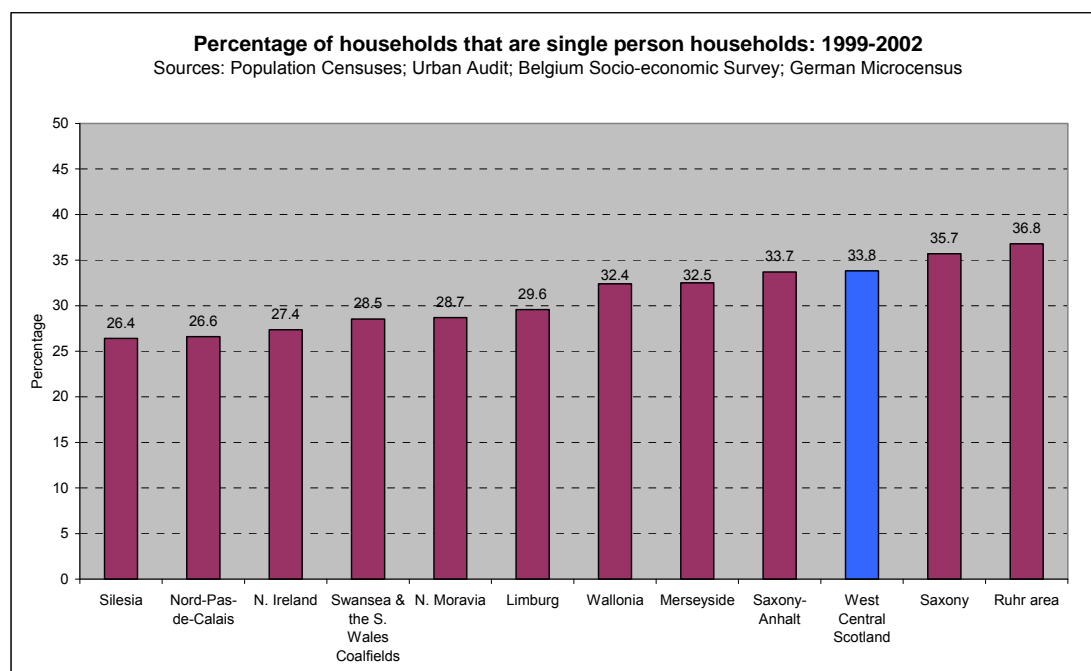
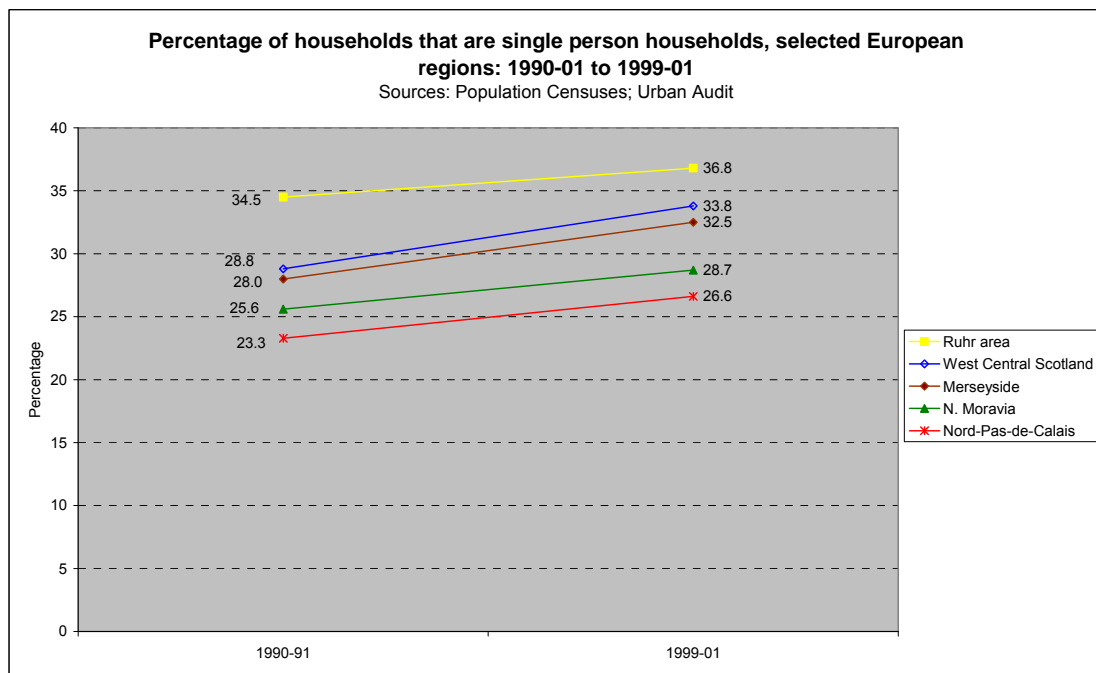


Figure 3.61 presents limited trend data on single person households between 1990-91 and 1999-01. Between 1990 and 2001, the percentage of single person households in WCS and Merseyside remained above levels seen in Northern Moravia and Nord-Pas-de-Calais, but below those seen in the Ruhr area. There is some evidence that the percentage of single person households increased at a faster rate in WCS compared to other regions.

Figure 3.61

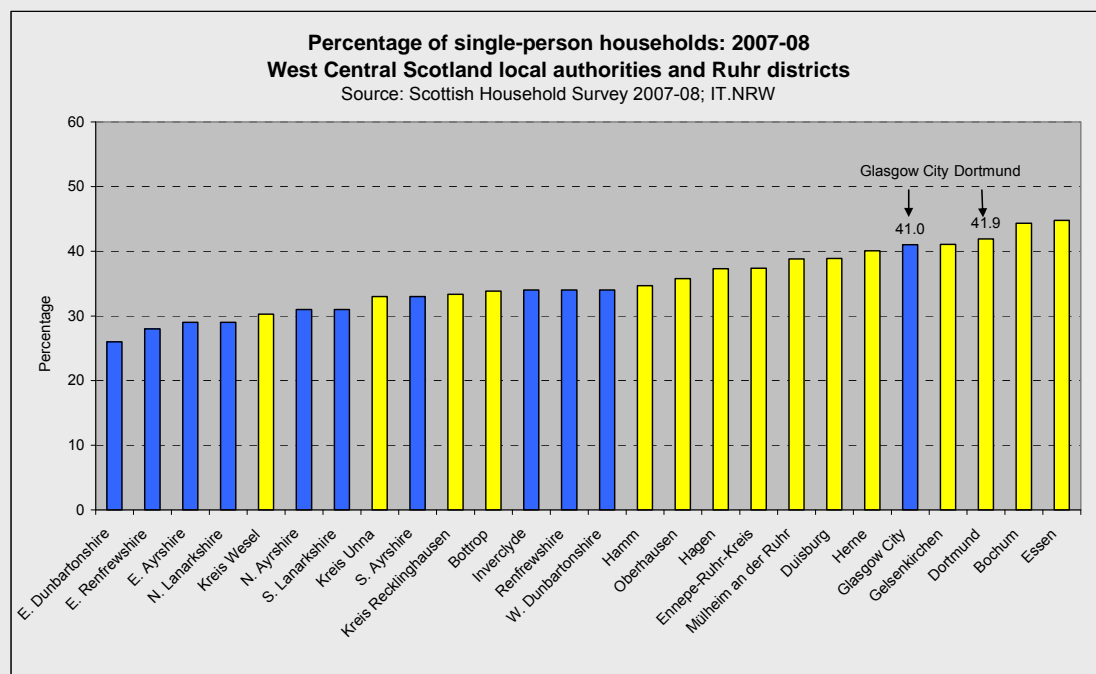




CASE STUDIES – THE RUHR AREA AND NORTHERN MORAVIA: Single person households

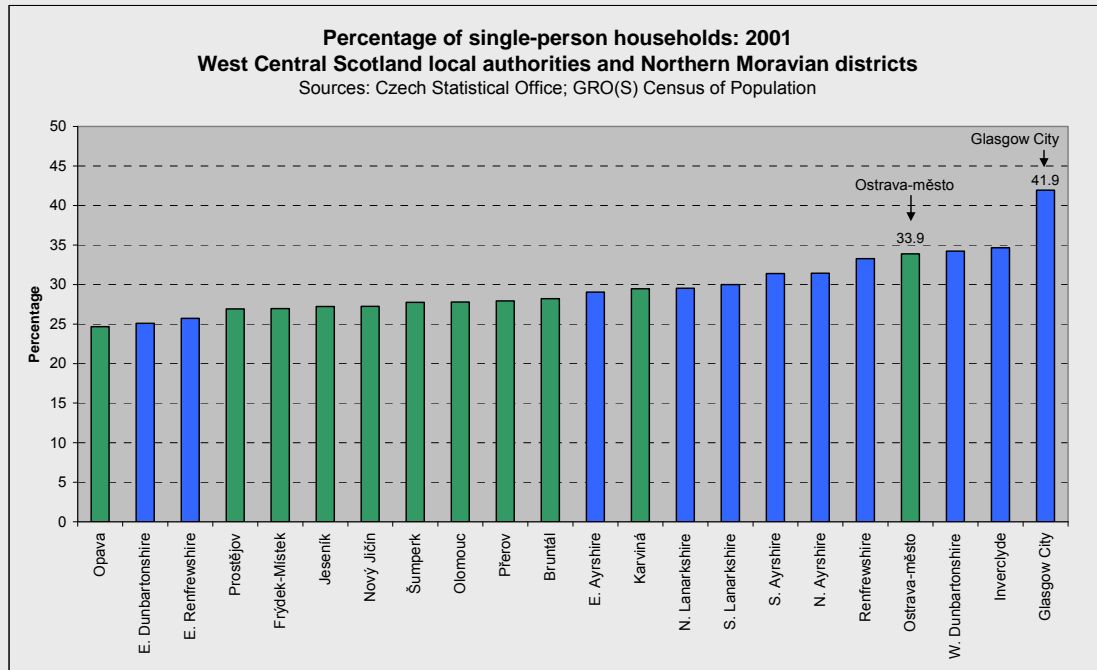
Comparisons of the proportion of single person households can also be made at a sub-regional level. As Figure 3.60 above showed, overall levels of single person households are slightly higher in the Ruhr area compared to WCS: 37% of households compared to 34%. Figure 3.62 shows that higher rates can be seen in the majority of the Ruhr's constituent districts (*kreise*). In WCS, the highest percentage is seen in Glasgow: at 41%, the figure is also comparable to that seen in German cities such as Dortmund.

Figure 3.62



In contrast, sub-regional comparisons of WCS local authorities with similar sized districts (*okresy*) in Northern Moravia show that the highest rates tend to be found in WCS: of the 10 highest rates in 2001, nine are found in WCS (Figure 3.63). The highest figure for Northern Moravia (33% in Ostrava-město) is eight percentage points lower than the highest figure for WCS.

Figure 3.63

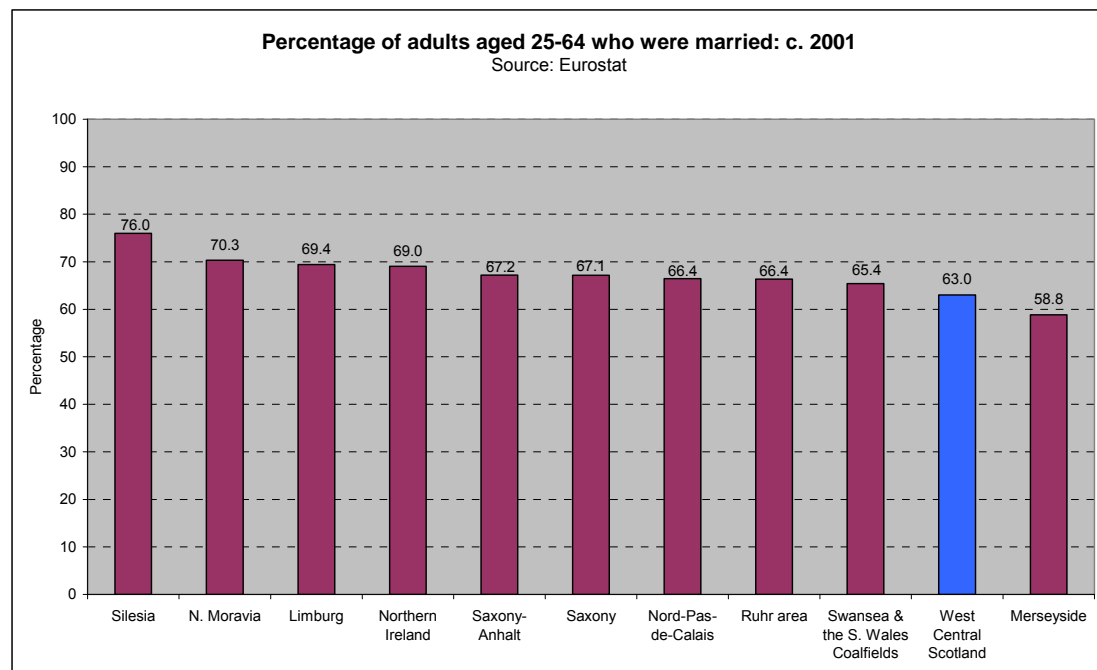


Marital status

An indicator related to single person households is 'marital status'. Several studies have indicated that during periods of economic dislocation, marriage acts as a protective factor against premature mortality, especially for men⁷⁸⁻⁸³. This section examines whether differences in marital status can help account for mortality trends in WCS. Results are shown as a percentage of adults aged 25-64, to adjust for different population structures across the regions and the fact that most adults in these regions did not marry until their mid-20s¹⁰³.

Figure 3.64 shows the percentage of adults aged 25-64 reporting that they were married (including those separated from their partners but still legally married) or in a civil partnership across the regions in 2001. In most regions, around two-thirds of the population in this age group were married. However, marriage rates were relatively low in WCS (63%) and Merseyside (58.8%). Marriage rates in Silesia, N. Moravia, Limburg and Northern Ireland were much higher.

Figure 3.64



Note: Data for Wallonia not available in comparable format. Estimates from the 2002-04 European Social Survey suggest that 67.0% of 25-64 year olds in the Belgium region were married (CI 63.5% - 70.4%, n=336).

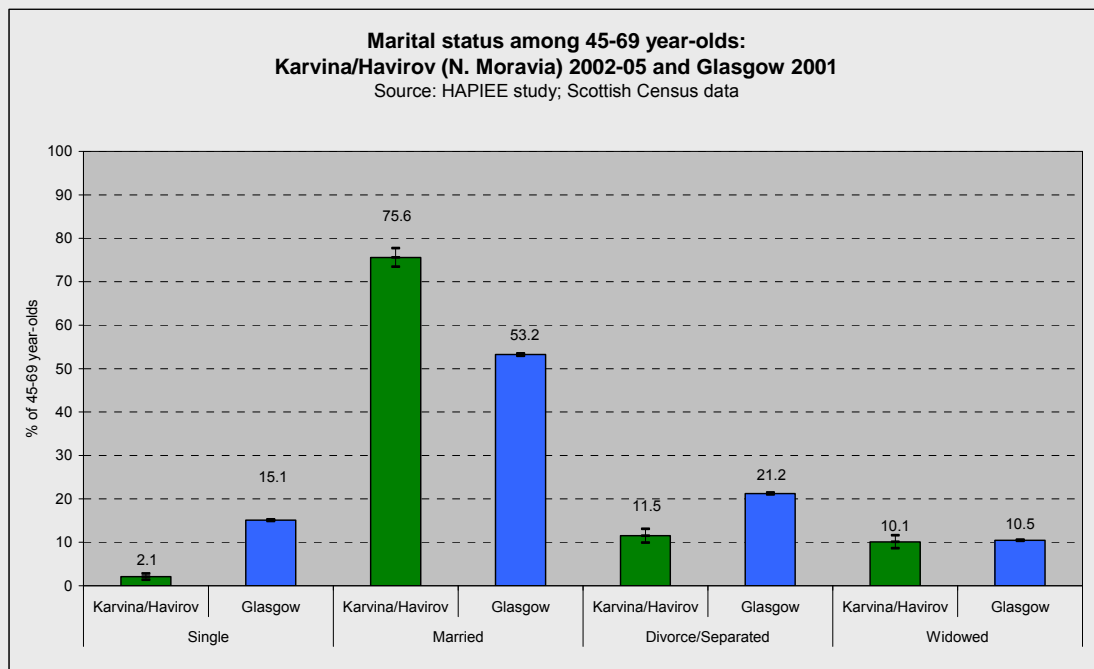


CASE STUDY – KARVINA/HAVIROV (N. Moravia): Marital status

Northern Moravia data come from the Health, Alcohol and Psychosocial factors In Eastern Europe (HAPIEE) study. The sample includes data on around 1,600 residents of Havirov and Karviná (two major towns within the Moravskoslezský part of Northern Moravia), aged 45-69 years, interviewed between 2002 and 2005. The comparative WCS data uses figures for Glasgow City from the 2001 Census.

The percentage of widowed adults aged 45-69 was very similar in both regions. However, the percentage of adults in this age group who were married was more than 20 percentage points lower in Glasgow than in Karvina/Havirov, driven by a higher number of adults who had never married and a divorce/separation rate that was much higher in the Scottish city (Figure 3.65).

Figure 3.65

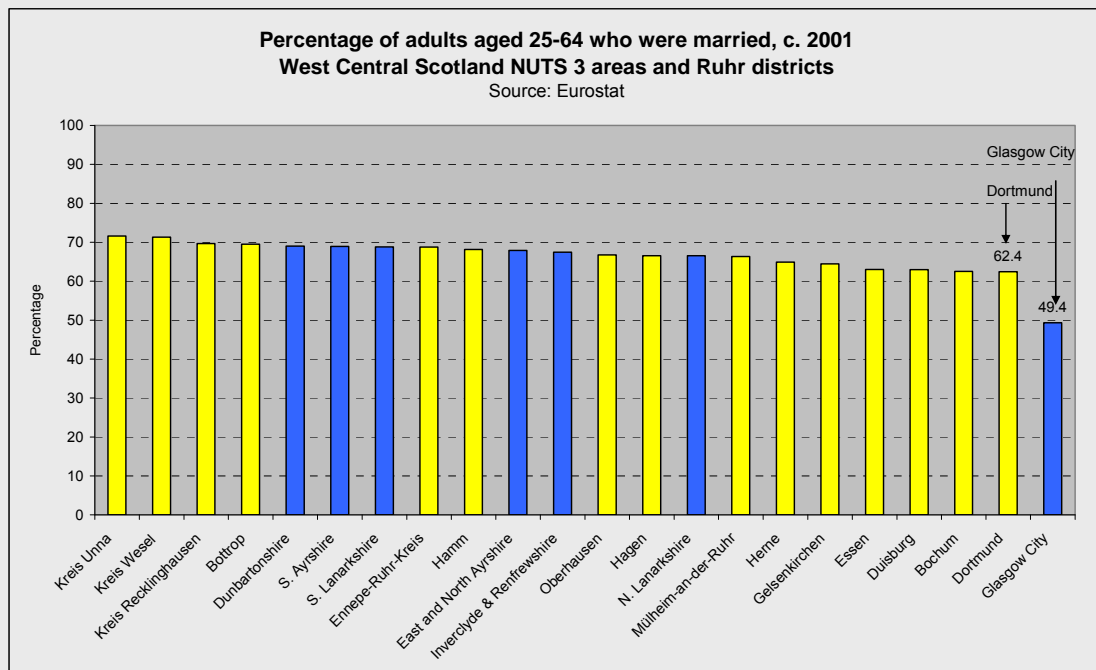




CASE STUDY – RUHR AREA: Marital status

As we saw earlier, marriage rates in WCS were also slightly lower than those in the Ruhr area of Germany (63.0% vs. 66.4%). Comparing marriage rates at a sub-regional level in the Ruhr area and WCS confirms Glasgow City's 'outlier' status in this regard. While 62.4% of adults aged 25-64 were legally married in the city of Dortmund, the figure was 49.4% in Glasgow City (Figure 3.66).

Figure 3.66



Social capital

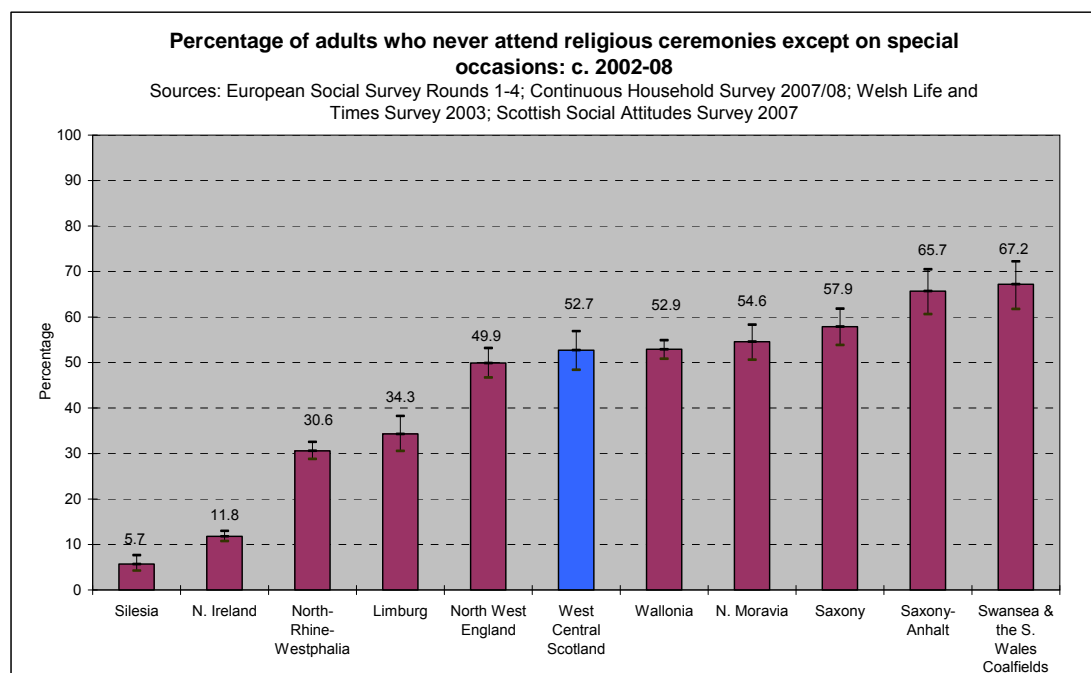
Social capital and social networks have been shown to be potentially important determinants of health^{104, 105, 106, 107, 108}. However, measuring social capital effectively is difficult to do. In this section we use a small number of indicators derived from different surveys and routine administrative sources as proxies for social capital. These are religious participation; trust; and political participation.

Social capital: religious participation

Religious participation offers opportunities for social contact, and may, therefore, reflect aspects of social capital. It has also been shown to be potentially protective against suicide¹⁰⁹. Figure 3.67 below uses a survey-based measurement of religious participation, and compares levels across the regions.

As this Figure shows, survey data suggest WCS is mid-ranked in relation to the percentage of its population who *never* attend religious ceremonies (except on special occasions). In 2007, just over half the adult population of WCS fell into this category, comparable to levels recorded in North West England (used as a proxy for Merseyside), Wallonia and Northern Moravia. Religious participation was highest in Silesia and Northern Ireland.

Figure 3.67



Sample sizes: Silesia=768, N. Ireland=3213, North-Rhine-Westphalia=1863, Limburg=573, North-West England=915, WCS=444, Wallonia=2305, N. Moravia=604, Saxony=1052, Saxony-Anhalt=639, Swansea & the S. Wales Coalfields=323. Nord-Pas-de-Calais results not shown as ESS French sample not representative at regional level. North-Rhine-Westphalia used as proxy for The Ruhr.

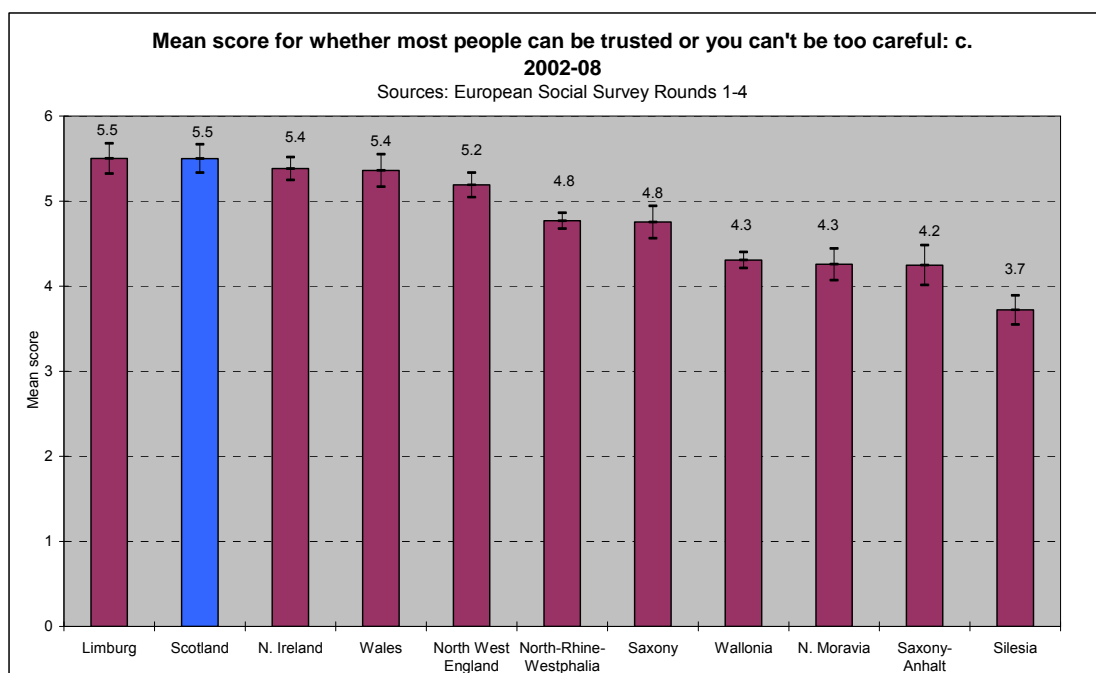
Social capital: trust

Some authors have argued that higher levels of trust are associated with better self-reported health, although the protective influence of trust may be more relevant to countries with greater income equality^{110, 111, 112}. This section compares survey-measured levels of trust across the regions of interest.

The European Social Survey measures general trust by asking people to rate the degree to which people can be trusted, on an eleven-point scale from zero ('you can't be too careful') to 10 ('most people can be trusted'). The same question was asked in the 2005 British Election Survey (BES 2005), permitting analysis at a regional level within Britain (including for the WCS). However, mean trust scores reported in BES 2005 were consistently higher than those for the European Social Survey for Scotland, Wales and the English regions, making it unwise to combine data from these surveys in this case.

As a compromise, Figure 3.68 compares mean trust levels for *Scotland (rather than WCS)* against the other relevant post-industrial regions. Mean levels of trust were relatively high in Scotland, close to levels reported in Limburg and the other European regions. General trust levels in Scotland were significantly higher than those reported for Wallonia, the German regions, Northern Moravia and Silesia. While data for Nord-Pas-de-Calais was unavailable, other research suggests general trust is lower in the French region than in Scotland.¹¹³

Figure 3.68



Sample sizes: Limburg=574, Scotland=663, N. Ireland=963, Wales=461, North West England=915, North-Rhine-Westphalia= 1873, Saxony=1052, N. Moravia=608, Saxony-Anhalt=640, Silesia=769. Nord-Pas-de-Calais results not shown as ESS French sample not representative at regional level. North-Rhine-Westphalia used as proxy for The Ruhr Wales used as proxy for Swansea & S. Wales Coalfields. NW England used as proxy for Merseyside.

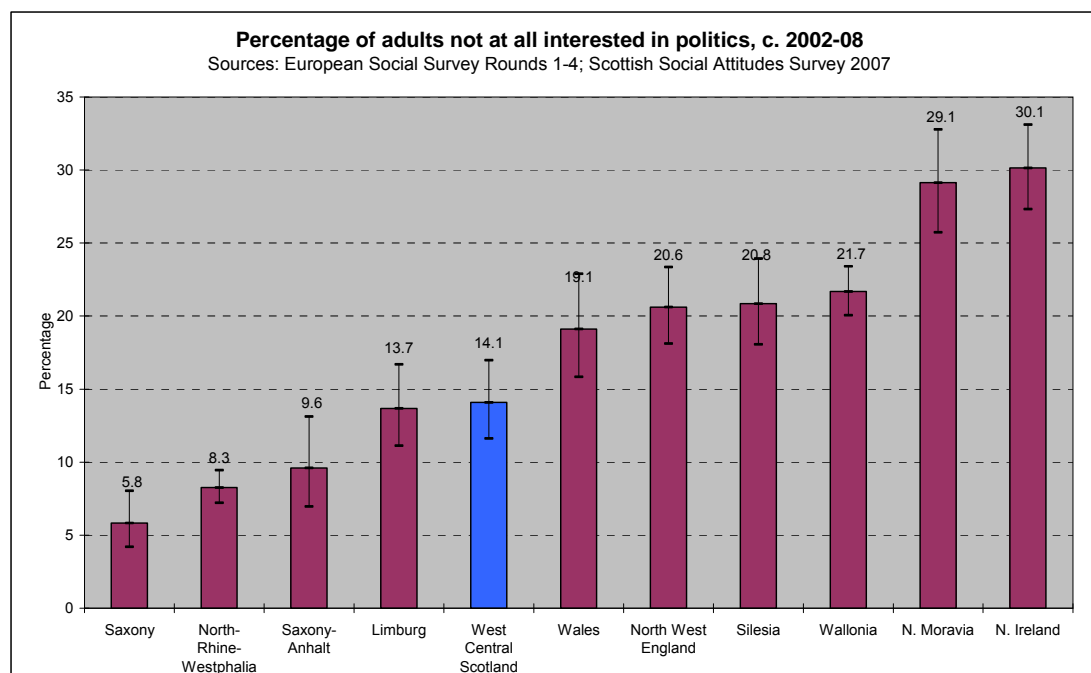
Social capital: political participation

Interest in politics and engagement in the political process is often used as an indicator of social capital.¹¹⁴

Figure 3.69 shows how stated disinterest in politics varies across the regions of interest. In 2007, 14.1% of WCS adults questioned in the Scottish Social Attitudes Survey said they were not at all interested in politics. Comparison with answers to the same question asked in the European Social Survey show that this figure for WCS is similar to levels observed for Limburg, and lower than recorded figures for the other UK regions, Wallonia, Silesia and N. Ireland. Adults in the German regions appear to be the most politically engaged in these terms^{lxx}.

^{lxx} This report includes a number of comparisons of European Social Survey (ESS) data with data for WCS derived from different Scottish surveys. To check the validity of this approach, the WCS data were compared with data for all Scotland from the ESS itself. This question on lack of interest in politics is the only instance where the WCS figure differs markedly from the ESS national figure (the national figure from ESS is 20.3% (95% CIs 17-24%), while the Scottish Social Attitudes Survey figure for WCS presented here is 14.1%). However, even if the (more comparable, but less geographically precise) data for all Scotland from ESS were used instead, it would still not radically change the Scottish position relative to the other regions.

Figure 3.69

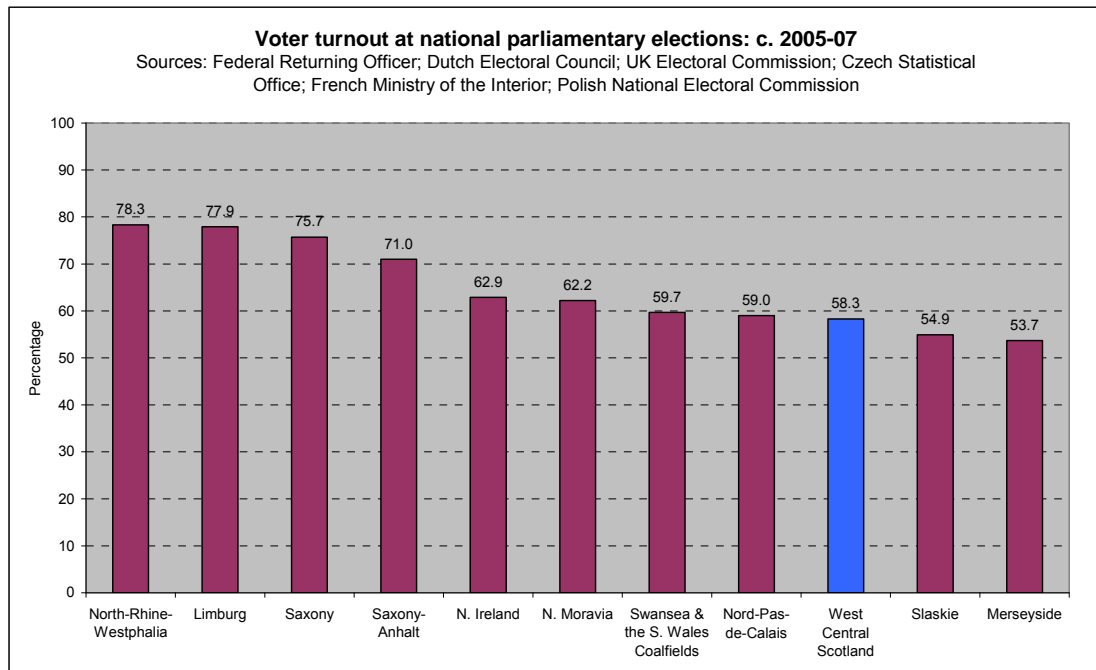


Sample sizes: Saxony=1053, North-Rhine-Westphalia=1871, Saxony-Anhalt=642, Limburg=573, WCS=536, Wales=463, North West England=915, Silesia=767, Wallonia=2317, N. Moravia=607, N. Ireland=965. Nord-Pas-de-Calais results not shown as ESS French sample not representative at regional level. North-Rhine-Westphalia used as proxy for The Ruhr. NW England used as proxy for Merseyside. Wales used as proxy for Swansea & S. Wales coalfields.

Stated interest in politics may not always translate into participation in the political process. Figure 3.70 shows turnout rates at national parliamentary elections, across the regions for which data were available. Note that Wallonia was excluded from analysis because voting is compulsory in Belgium.^{lxxi} Voter turnout was relatively high in the three German regions (75-80%) and relatively low in Silesia and on Merseyside (less than 55%). At 58%, turnout rates in the WCS were comparable to those seen in Nord-Pas-de-Calais and Swansea and the South Wales Coalfields.

^{lxxi} More information on countries where voting is compulsory is available here: http://www.idea.int/vt/compulsory_voting.cfm

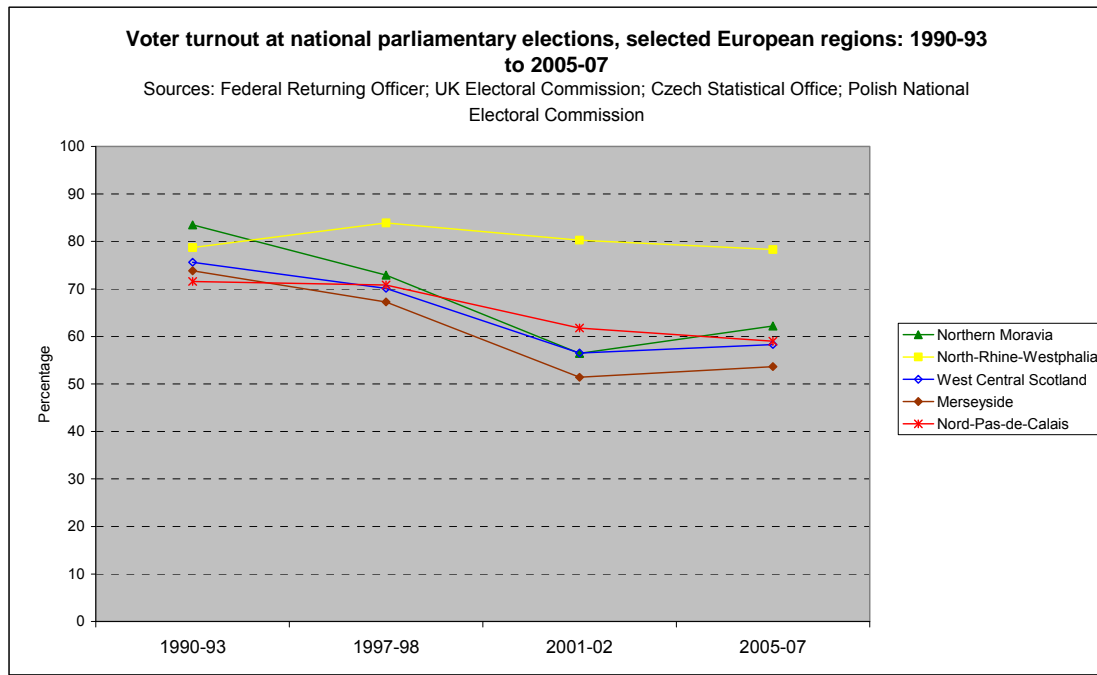
Figure 3.70



Note: North-Rhine-Westphalia used as proxy for The Ruhr

Figure 3.71 tracks voter turnout at the national parliamentary elections in five regions between 1990-93 and 2005-06. In 1990-93, the highest voter turnout rates were seen in Northern Moravia and the lowest in Nord-Pas-de-Calais; WCS was mid-ranked. During the 1990s, voter turnout declined steadily in Northern Moravia, WCS, Nord-Pas-de-Calais and Merseyside, stabilising around 55-60% in 2001. Northern Moravian rates converged with those of the West European regions. By contrast, voter turnout in North-Rhine Westphalia remained at around 80% across four elections.

Figure 3.71



Note: North-Rhine-Westphalia used as proxy for The Ruhr because constituency level data not readily available prior to 1998. Turnout statistics for the Ruhr and NRW were very similar in 1998, 2002 and 2005.

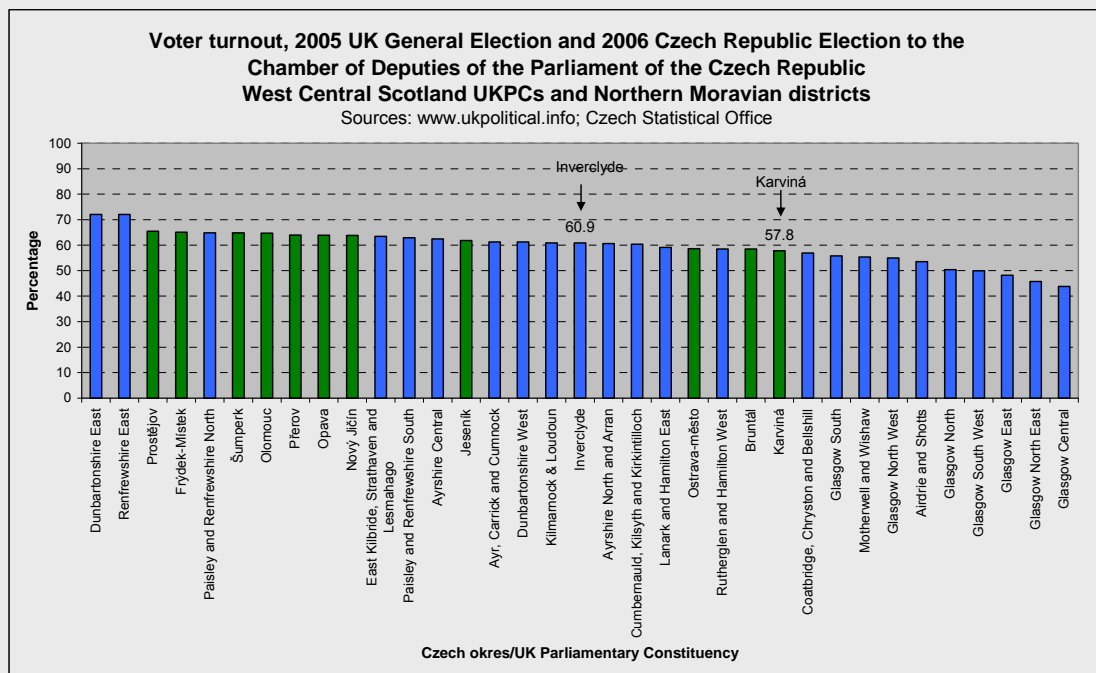


CASE STUDIES – NORTHERN MORAVIA AND THE RUHR AREA:

Voter turnout

Sub-regional analysis largely confirms the analyses shown above. Although 2005 voter turnout in some Glasgow Parliamentary Constituencies was very low (falling below 50% for the Central, East and North East of the city), turnout in most WCS parliamentary constituencies was close to that seen in Northern Moravia in the Czech Republic at around the same time (Figure 3.72). For example, in 2005-06, voter turnout in the industrial districts of Karviná (Northern Moravia) and Inverclyde (WCS)^{lxxii} was very similar.

Figure 3.72

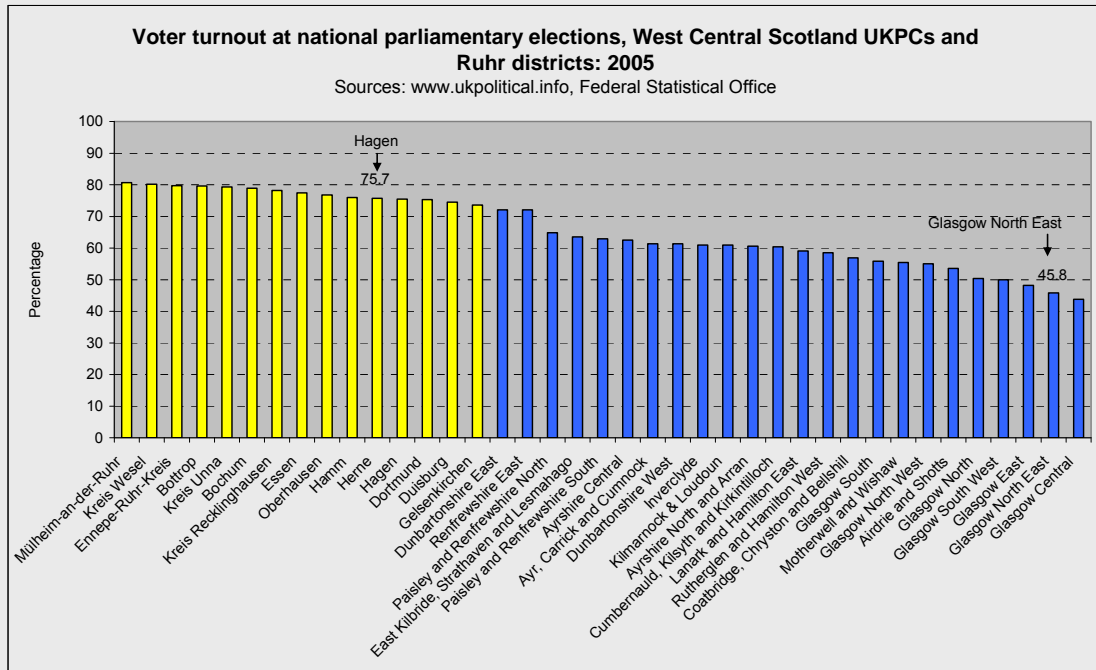


The comparison with districts within the Ruhr area for 2005 is more striking. Every one of the Ruhr districts had a voter turnout comparable to the ‘best’ WCS parliamentary constituencies (Figure 3.73). As shown in the chart, 2005 voter turnout in the Ruhr city of Hagen was 30 percentage points higher than in the Glasgow North East constituency^{lxxiii}.

^{lxxii} Karviná had an electorate of 34,000 (2007), while Inverclyde parliamentary constituency had an electorate of 59,000 (2005).

^{lxxiii} In 2005, the Hagen electorate was 160,000, compared to 62,000 in Glasgow North East parliamentary constituency.

Figure 3.73



Summary: Social environment

- The social environment can influence health in a number of ways. This section compares selected aspects of educational attainment, household composition, living arrangements and social capital across the post-industrial regions.
- **Educational attainment** was polarised in WCS, with a relatively high proportion of the adult population having either low/no qualifications, or being educated to higher, tertiary level.
- WCS, along with Merseyside and the Ruhr, had a relatively high percentage of **lone-parent households** in 2001.
- The Scottish region (along with the German regions, Wallonia and Merseyside) also had a relatively high concentration of **single-person households**.
- In 2001, the percentage of 25-64 year-olds in West Central Scotland who were **married** was also relatively low.
- Indicators of **social capital** suggest that: **religious participation** in WCS is mid-ranked compared to the other regions; levels of **trust** are comparatively high in Scotland; **interest in politics** in WCS is higher than most other regions; **voter turnout** rates in WCS were lower than those in the German regions, higher than Silesia and Merseyside but comparable to the remaining regions.

3.7 The physical environment

Introduction

The natural and built environments expose individuals and communities to factors that can create or destroy health. Extremes of temperature can increase mortality rates, especially in the elderly¹¹⁵, while lack of sunlight is associated with low well-being¹¹⁶. Overcrowding and perceived levels of safety also have the potential to impact on physical and mental well-being¹¹⁷. This section compares a number of indicators of the physical environment for WCS and the other post-industrial regions.

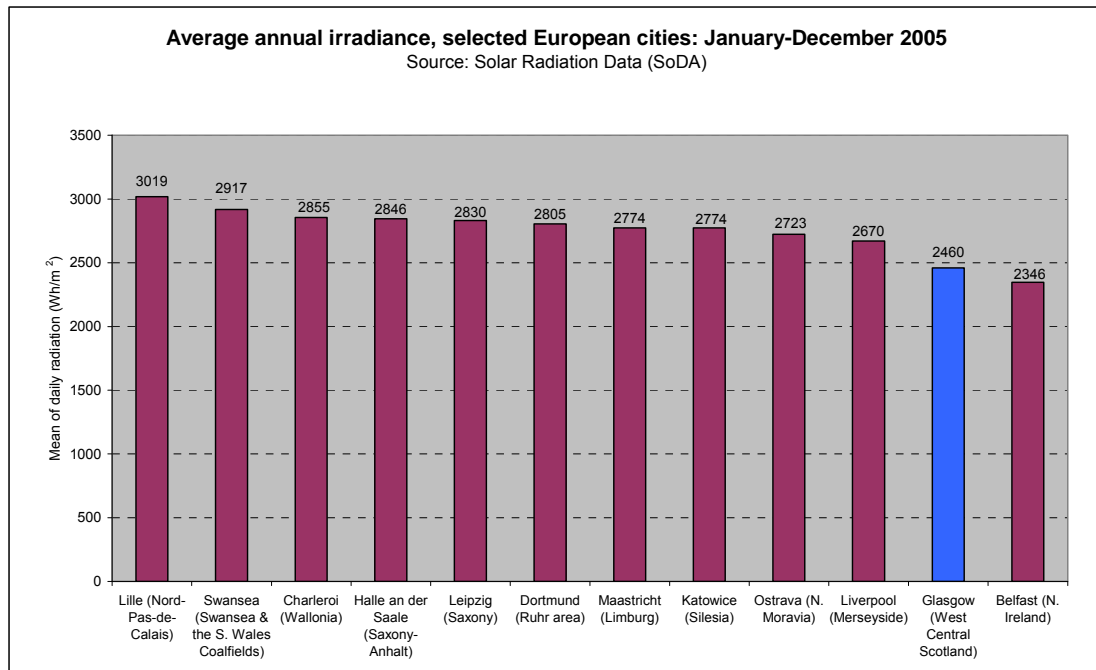
Climate

Some commentators have suggested that the Scottish climate – especially low levels of sunlight and associated risk deficiency in vitamin D – may partly account for our excess mortality and higher rates of chronic diseases, such as Multiple Sclerosis.¹¹⁸ Figure 3.74 shows the average levels of sunshine reaching the ground in 2005, for twelve European cities within the relevant regions. This is measured by the twelve-month average of daily solar irradiance in Watt hours per square metre (Wh/m²)^{lxxiv}. Although data are only available for one year – a clear constraint – the results show that Glasgow received the second lowest levels of sunlight in 2005^{lxxv}. Belfast (in Northern Ireland) had the lowest level. The remaining regions had 200-500 additional Watt hours per square metre (Wh/m²), indicating more sunshine reaching the ground in those regions, over this period.

^{lxxiv} More information can be found here: <http://www.soda-is.com/eng/index.html>

^{lxxv} Note that, although not shown here, this is also particularly true of the summer months (May-September).

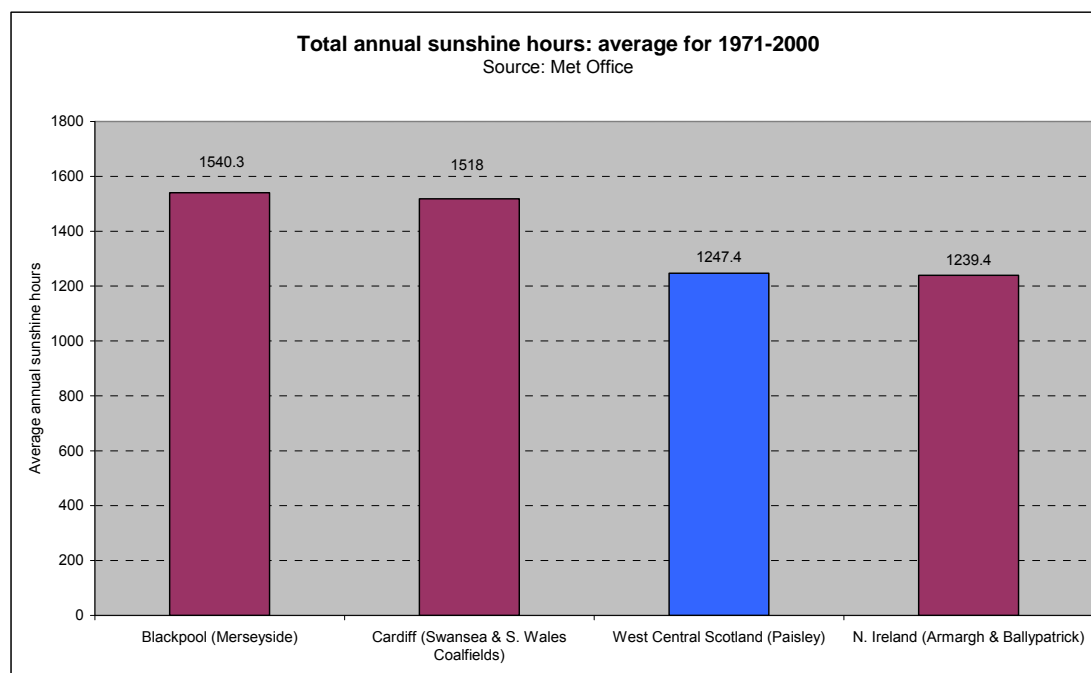
Figure 3.74



Note: relevant region shown in parenthesis.

The use of data from one single year may of course present a skewed picture, but unfortunately data for several years for all the regions of interest are not available. However, we can at least compare similar data over a longer period for the relevant UK regions. Figure 3.75 shows the average annual hours of sunshine in four Met Office monitoring stations (within WCS, Merseyside, S. Wales and Northern Ireland) between 1971 and 2000. It shows that levels of sunlight in WCS are low compared to those in Merseyside and South Wales, but similar to Northern Ireland.

Figure 3.75

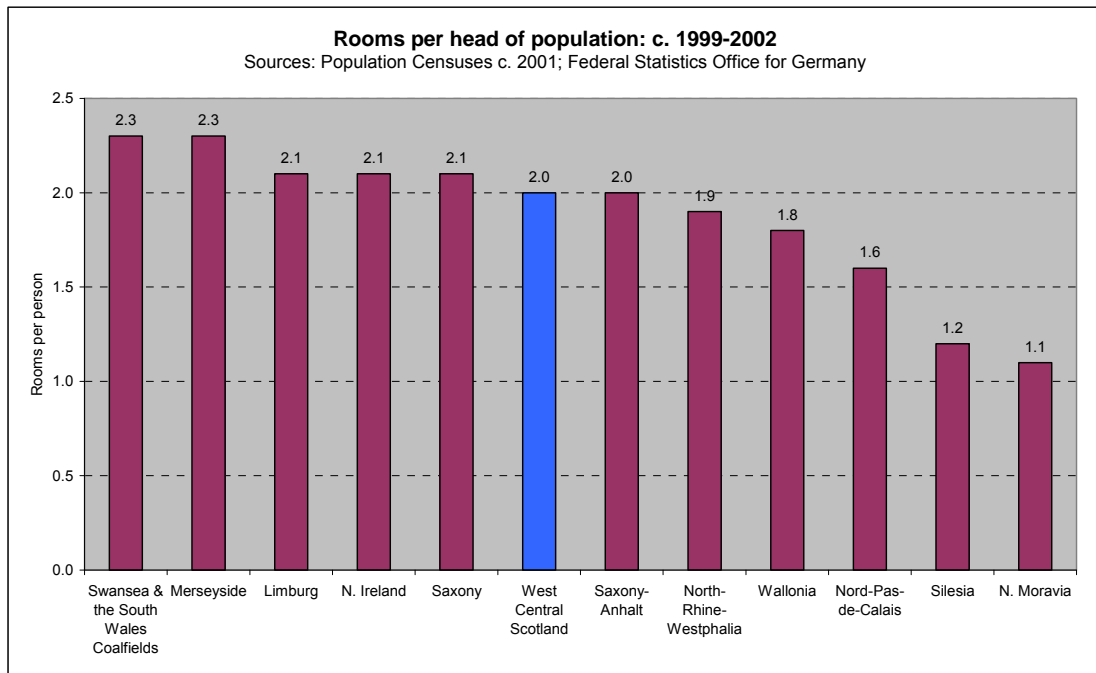


Note: Monitoring stations for N. Ireland and WCS shown in parenthesis. Blackpool monitoring station used as source for Merseyside climate. Cardiff monitoring station used as proxy for Swansea & the S. Wales Coalfields.

Overcrowding

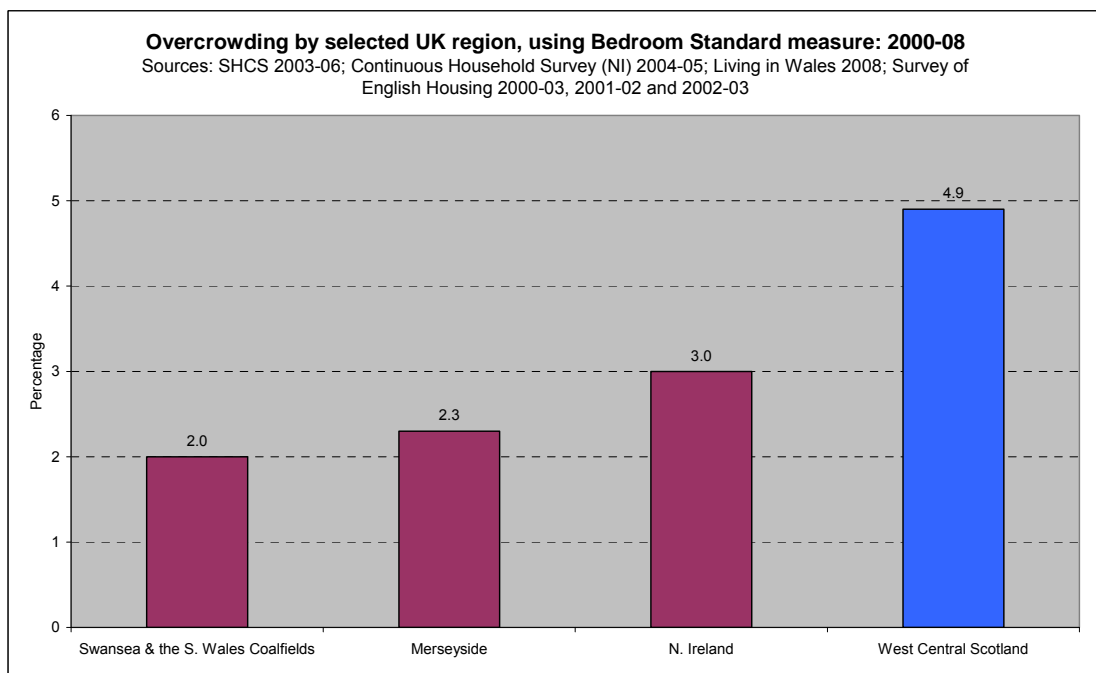
Levels of overcrowding have been shown to be associated with adverse health outcomes including higher rates of mortality and morbidity among both children and adults.¹¹⁹ Ideally it would have been useful to calculate time trends in overcrowding (based on number of rooms available to households relative to their size and composition) for the relevant regions, but unfortunately comparable data were not available. Instead, Figure 3.76 presents a very crude measure of overcrowding – the total number of rooms per head of population – across the twelve post-industrial regions. WCS is mid-ranked in this analysis, with a similar number of rooms per head of population to Saxony and Saxony-Anhalt. On this basis, the most overcrowded regions are Silesia and Northern Moravia.

Figure 3.76



Note: North-Rhine-Westphalia used as proxy for The Ruhr

Figure 3.77



More sophisticated measures of overcrowding, such as the Bedroom Standard^{lxxvi}, are available for within-UK comparisons. Figure 3.77 compares the percentage of overcrowded households in the four UK regions on this basis using data derived from different UK surveys. This suggests that almost one in every twenty WCS households was overcrowded in 2003-06: this was the highest of the four regions compared, and more than twice as high as levels observed on Merseyside.

^{lxxvi} The Bedroom Standard compares the actual number of bedrooms available to a household with the number required based on the age, gender and marital status of each occupant. Where the actual number available falls below the required number, the household is deemed to be overcrowded.

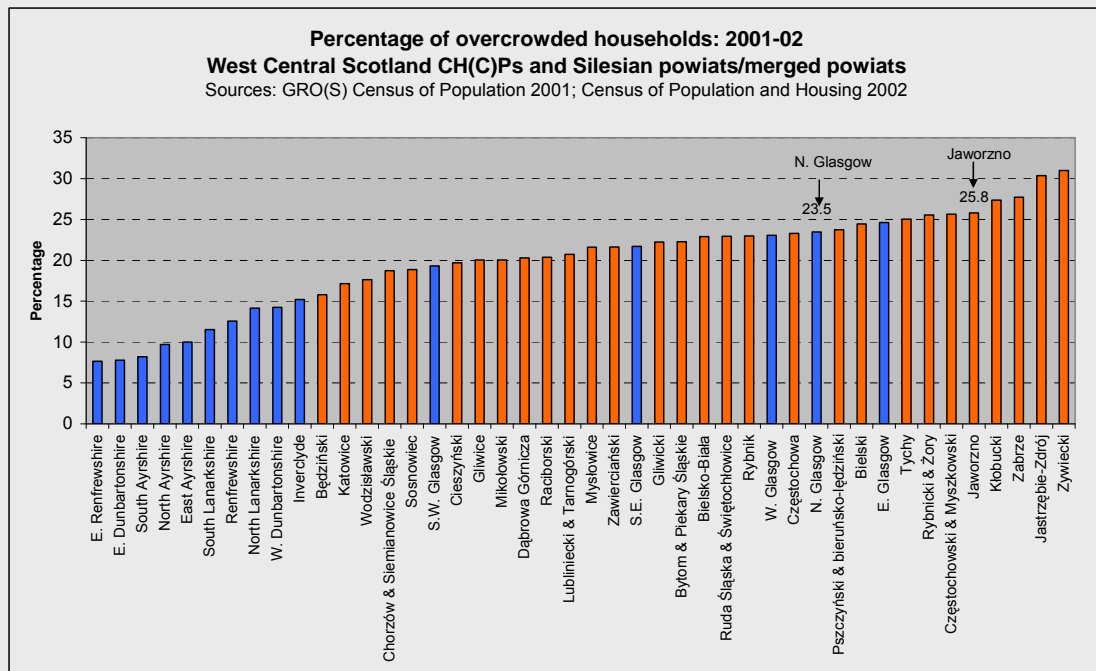


CASE STUDIES – SILESIA AND NORD-PAS-DE-CALAIS:
Persons per room

Using another, slightly different, measure of overcrowding (the percentage of households with more than one person per room), comparisons can be made of levels of overcrowding at a sub-regional level between WCS, Silesia in Poland and Nord-Pas-de-Calais in France.

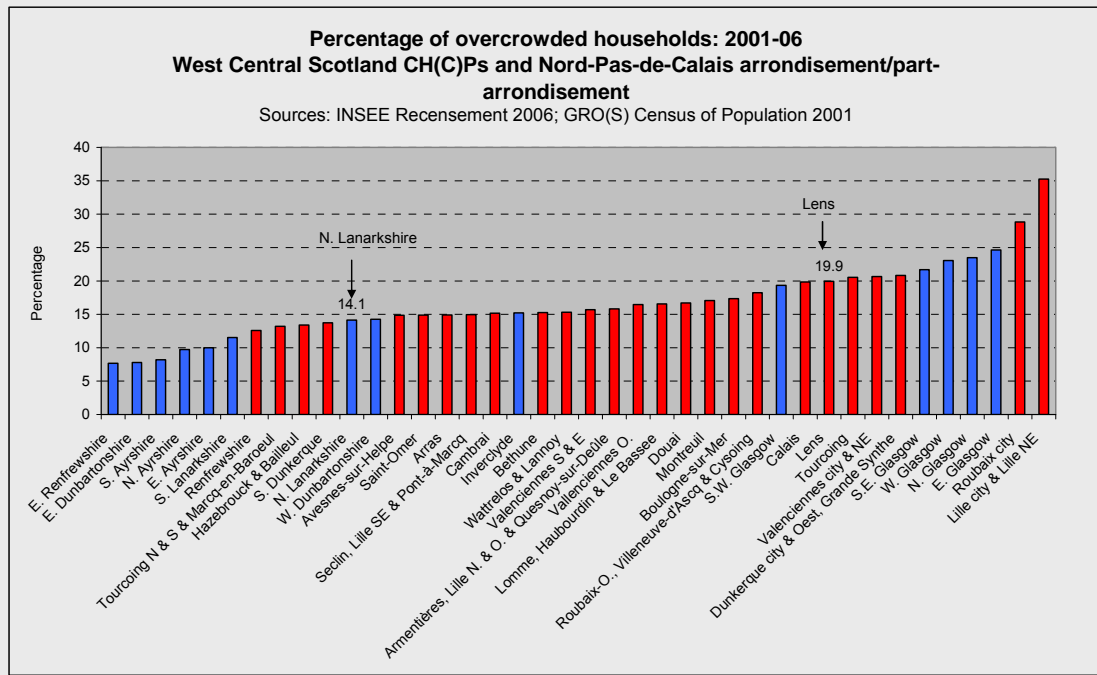
In 2001, levels of overcrowding in most WCS CHP areas were low compared to the Silesia counties (powiats). The exception was Glasgow City, which could match the levels of overcrowding found in many parts of the Silesia region. In North Glasgow CHP one in four households could be classified as overcrowded in 2001, a very similar level to the city of Jaworzno.

Figure 3.78



WCS compares more favourably still for this indicator in relation to Nord-Pas-de-Calais (Figure 3.79). For example, the percentage of overcrowded households in the cities of Lille and Roubaix was appreciably higher than that seen in Glasgow, while overcrowding levels in North Lanarkshire were more than five percentage points lower than in the similar ex-coalfields district of Lens.

Figure 3.79

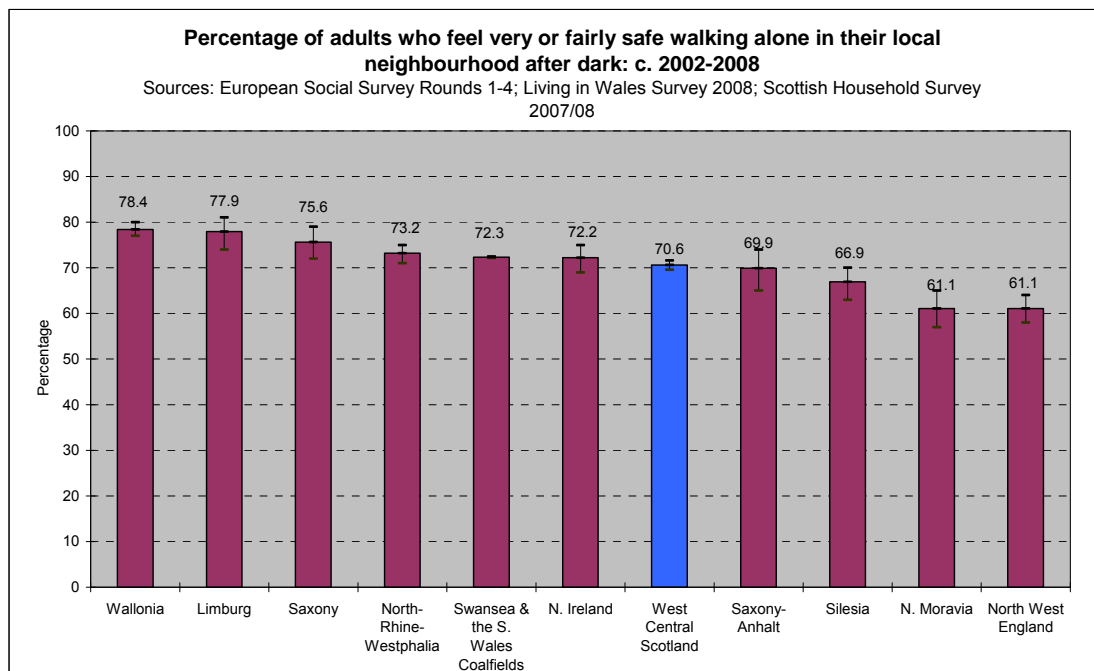


Feelings of safety in neighbourhood after dark

Perceptions of neighbourhood safety can impact on physical health by discouraging walking and physical activity¹²⁰. They may also have a negative impact on the mental health of adults and children¹²¹ and be associated with increased risk of victimisation or of committing acts of violence, although the causal pathways are often complex and indirect¹²².

Figure 3.80 compares perceived levels of safety using data derived from three European and national surveys. This shows that more than 70% of adults in WCS reported that they felt safe walking alone in their local neighbourhood after dark. This places WCS in the middle of the range of reported values, with levels of reported safety lower than the Benelux regions and Saxony, but higher than Silesia, Northern Moravia and North West England (the latter used as a proxy for Merseyside).

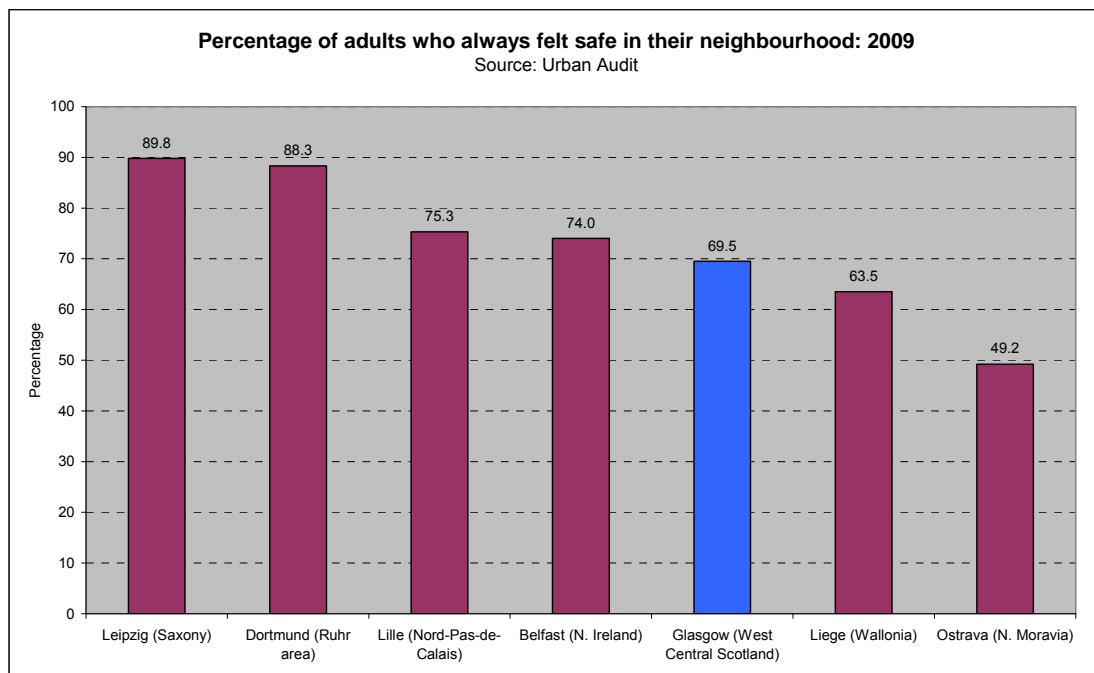
Figure 3.80



Sample sizes: Wallonia=2311, Limburg=571, Saxony=1053, North-Rhine-Westphalia=2543, Swansea & the S. Wales Coalfields=2543, N. Ireland=951, WCS=6692, Saxony-Anhalt=637, N. Moravia=586, North West England=911. North-Rhine-Westphalia used as proxy for The Ruhr. NW England used as proxy for Merseyside.

Similar comparisons of neighbourhood safety between relevant European cities also show Glasgow to be in the middle of the range of values (Figure 3.81). In 2009, 69.5% of adults in Glasgow reported they always felt safe in their local neighbourhood. This was low compared to Leipzig in Saxony and Dortmund in The Ruhr, but higher than that reported for Liege (in Wallonia) and Ostrava (N. Moravia).

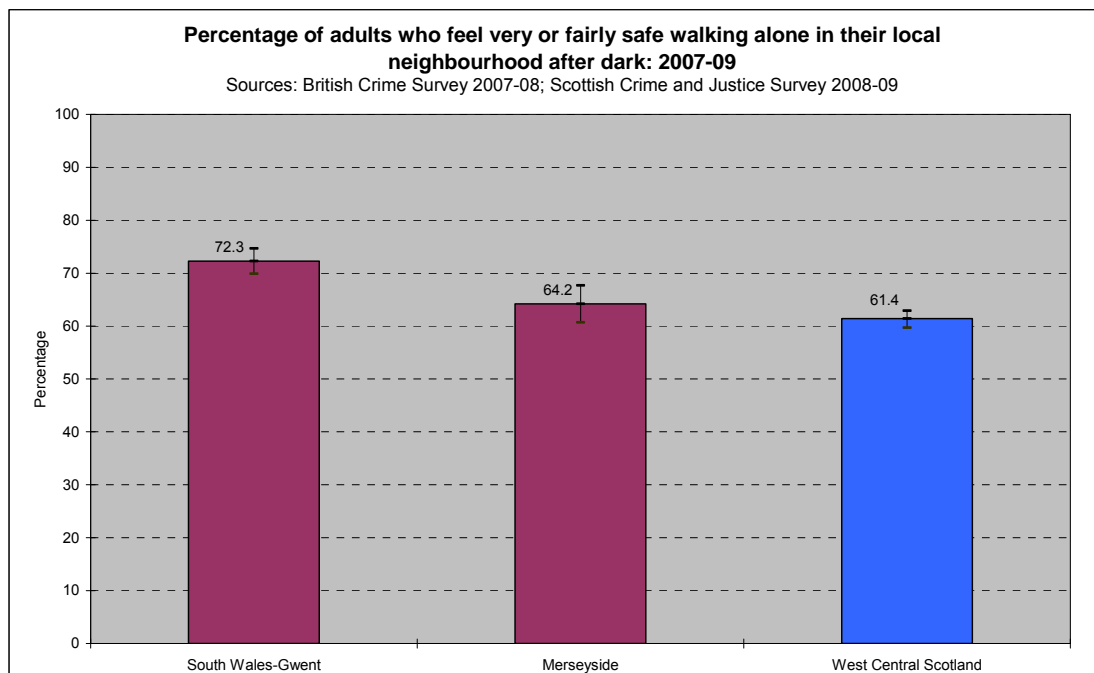
Figure 3.81



Sample sizes: Leipzig=500, Dortmund=505, Lille=503, Belfast=500, Glasgow=500, Liege=502, Ostrava=501.

These analyses suggests that perceptions of community safety in WCS are moderate when compared to similar European regions. Figure 3.82 presents data from British crime surveys to compare feelings of safety after dark in three mainland UK areas. Levels of perceived neighbourhood safety in WCS were lower than the other mainland British areas, though the difference with Merseyside was not significant^{lxxvii}.

Figure 3.82



Sample sizes: South Wales-Gwent=2069, Merseyside=1010, WCS=5374. Confidence intervals based on unweighted bases.

^{lxxvii} The figure reported for Greater Manchester was almost identical to West of Scotland, which may explain the lower perceived safety figure for North West England shown in Figure 3.80.



CASE STUDIES – RUHR AND NORTHERN MORAVIA:

Neighbourhood safety

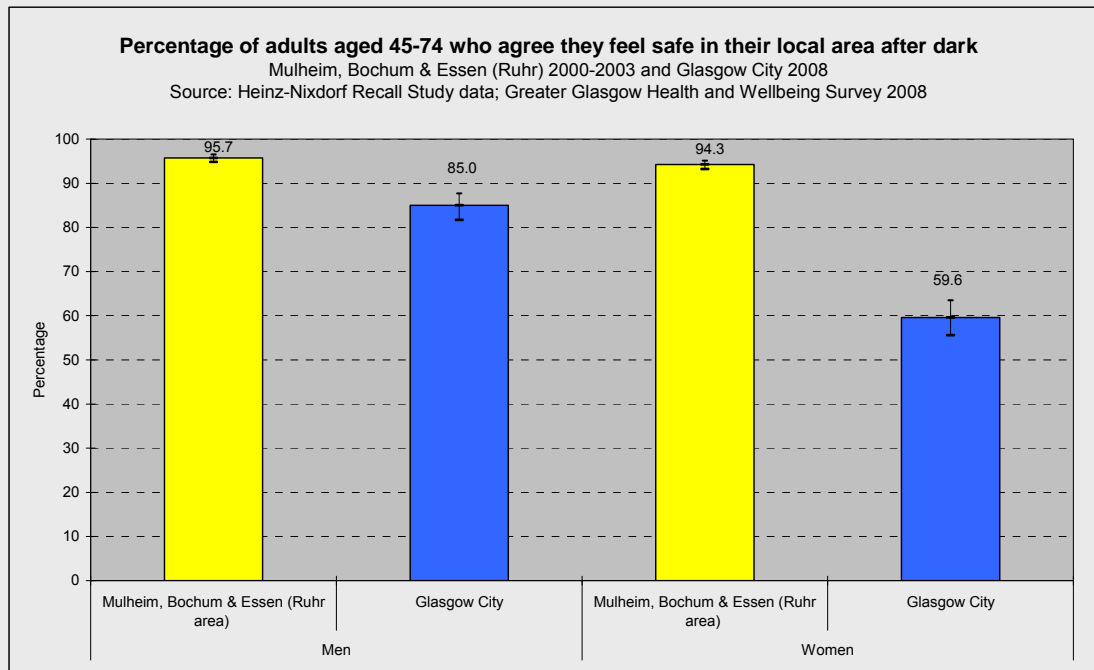
Levels of recorded violence in Glasgow are high compared to many other European cities¹²³, but there is little published data to allow us to compare relevant post-industrial cities directly. As shown above, the Urban Audit data point to a mixed picture, with Glasgow residents feeling less safe than those in Dortmund but more safe than their counterparts in the city of Ostrava (in N. Moravia). This section explores this issue in more depth.

Ruhr area data are derived from the HNR Study. WCS data for the same age group for Glasgow City come from the 2008 Greater Glasgow & Clyde Health and Well-being Survey¹²⁴.

The analysis confirms that feelings of safety were significantly lower in Glasgow City than the cities of the Ruhr (Figure 3.83). In the Ruhr cities, 96.7% of men aged 45-74 agreed they felt safe in their local area after dark, compared to 85.0% of men in the same age group in Glasgow city. For women, the gap was even starker: 94.3% of 45-74 year olds agreed they felt safe in Mulheim, Bochum and Essen but this fell to just 59.6% in Glasgow. However, some of these differences may well be attributable to variation in the question wording^{lxxviii}.

^{lxxviii} The Glasgow survey asked respondents whether they felt safe walking alone around this local area even after dark (agree/neither agree nor disagree/disagree). Those who responded neither agree nor disagree were excluded from the base. The HNR survey asked respondents whether they felt safe in area of residence during the night (strongly agree/agree/disagree/strongly disagree).

Figure 3.83

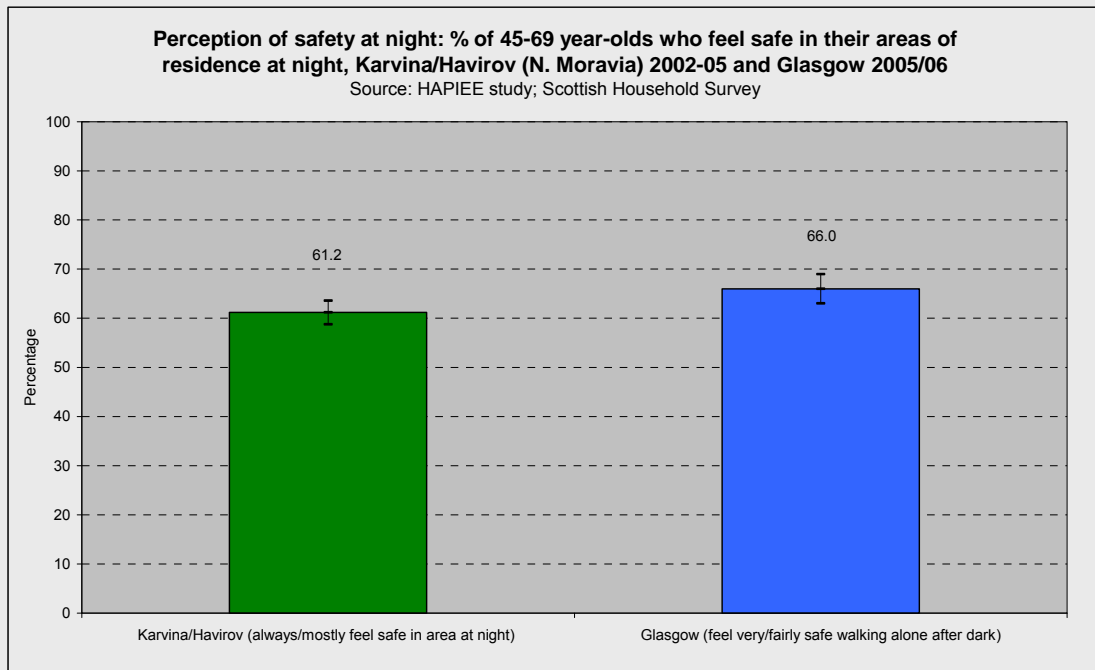


Sample sizes: HNRS 2000-2003 (3 cities) – 2326 men and 2332 women, Greater Glasgow Health & Well-being Survey 2008 (Glasgow City) – 523 men and 677 women.

Using the HAPIEE study, we can also contrast perceptions of neighbourhood safety in two large N. Moravian cities (Karvina/Havirov) with Glasgow City (Figure 3.84). This comparison reveals that perceptions of safety were higher in Glasgow compared to these Czech cities (66% vs. 61%^{lxxix}), a finding consistent with the impression given by Urban Audit.

^{lxxix} Note, however, because of the relatively small sample sizes involved (and the resulting overlapping 95% confidence intervals) these differences are not statistically significant.

Figure 3.84



Sample sizes: HAPIEE= 1564, Scottish Household Survey=980.

Summary: Physical environment

- This section used three sets of indicators to compare aspects of the physical environment in WCS with the other post-industrial regions. These analyses showed that:
 - **Sunlight** levels in WCS were comparatively low: for example, every post-industrial region except Northern Ireland received more sunshine in 2005.
 - **Overcrowding** levels in the WCS region were moderate in a European context but high compared to other UK regions.
 - WCS was mid-ranked in terms of levels of perceived **community safety** compared to the other European regions.

3.8 Behavioural factors

Introduction

Lifestyle choices – particularly smoking, alcohol consumption, physical activity and diet – can have a profound impact on the health of individuals and populations.^{125, 126} However, such health behaviours are not formed in isolation: they are strongly influenced by cultural norms, social inequalities and family background⁴². That Scotland's health behaviours compare adversely to England and Wales is well known¹²⁷. Systematic international comparisons are more difficult to make, due to limited data³². With those limitations in mind, this section will compare and contrast differences in health behaviours in WCS and European regions for which evidence is available.

Smoking

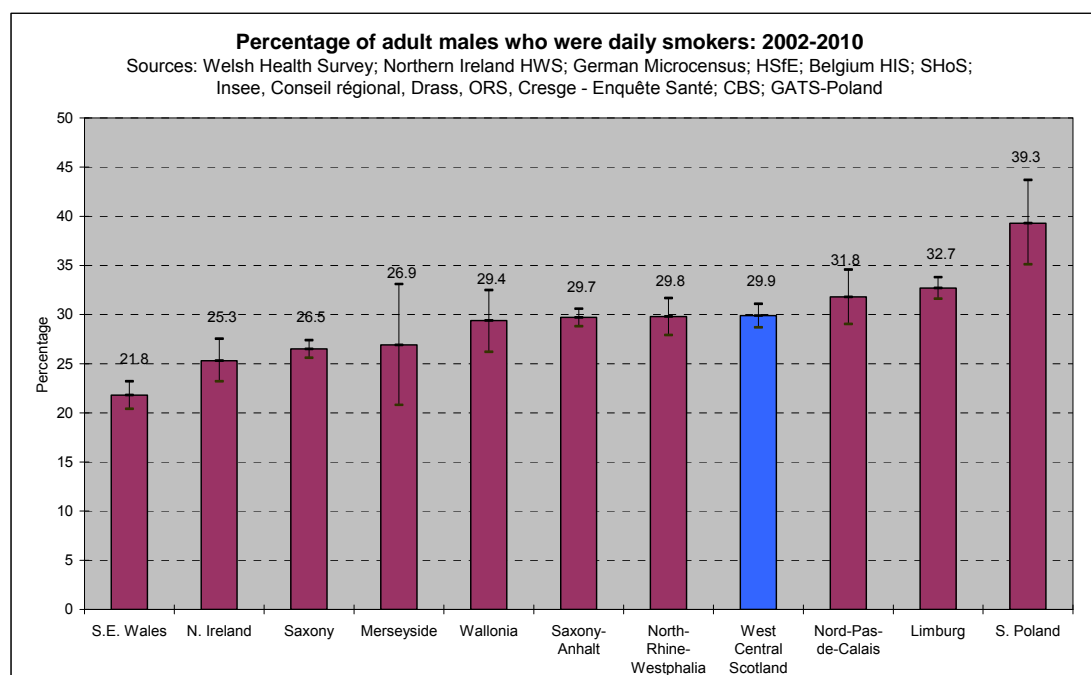
Tobacco remains a major risk factor for a range of causes of death, especially lung cancer but also cardiovascular disease, strokes and COPD^{128, 129, 130, 131}. In Scotland, smoking rates for men are not especially high in a European context (though they are high compared to England, Wales and Northern Ireland¹³²). However, smoking rates for women are among the highest in Europe¹³⁵. Does this pattern also apply when comparing WCS to other post-industrial areas in Europe?

The indicator used here is the percentage of adult daily smokers, defined as those who smoked at least one cigarette a day. Results were obtained separately for men and women for eleven regions: no 'all-age' data were available for Northern Moravia.

Just under a third (29.9%) of men in West Central Scotland (WCS) reported smoking daily in 2003-04. This figure was high compared to the rates seen in N. Ireland, S.E. Wales and Saxony, but similar to that observed for the other West European regions and Saxony-Anhalt and lower than the figure for

Southern Poland^{lxxx} (Figure 3.85). Smoking rates for women were lower than men in every region. However, at 28.4%, the percentage of female daily smokers in West Central Scotland was the highest of the eleven regions for which data were available (Figure 3.86).

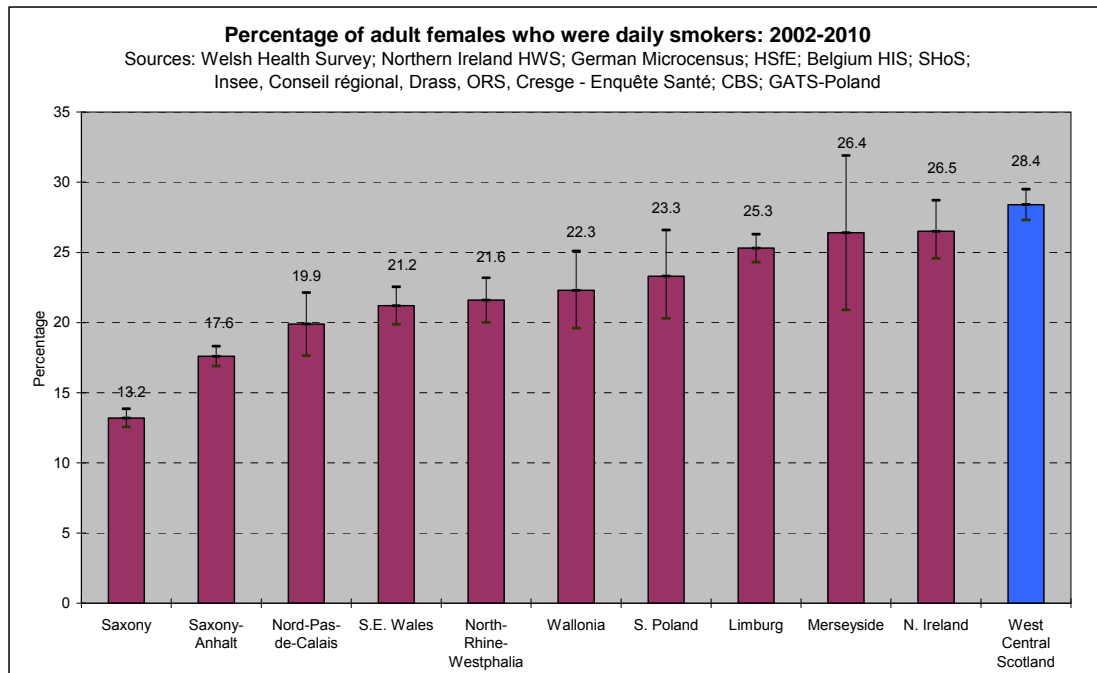
Figure 3.85



Sample sizes: S.E. Wales=3255; N. Ireland=1736; Saxony=9352; Merseyside=317; Wallonia=1605; Saxony-Anhalt=10021; North-Rhine Westphalia=2283; West Central Scotland=4685; Nord-Pas-de-Calais=1097; S. Poland=840. Limburg sample size n/a. S.E. Wales is used as a proxy for Swansea & S. Wales coalfields; North-Rhein-Westphalia is used as a proxy for The Ruhr. S. Poland used as proxy for Silesia.

^{lxxx} As noted in the Silesia Case study, South Poland equates to Silesia plus Malopolskie. Based on published I2SARE data for 2004, the smoking prevalence in Silesia is likely to be higher than that for South Poland, but unfortunately no gender breakdown is available in the I2SARE data.

Figure 3.86



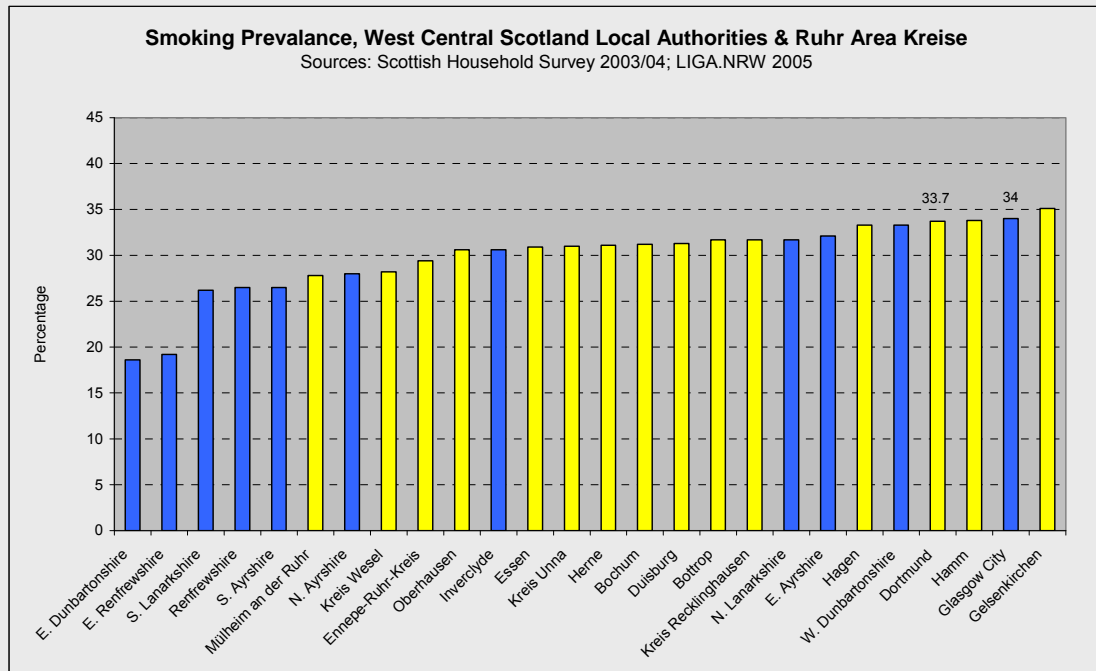
Sample sizes: Saxony=10415; Saxony-Anhalt=11244; S.E. Wales=3769; North-Rhine-Westphalia=2591; Wallonia=1851; S. Poland=833; Merseyside=389; N. Ireland=2482; West Central Scotland=6498; Nord-Pas-de-Calais=1207. Limburg sample size n/a. S.E. Wales is used as a proxy for Swansea & S. Wales coalfields. North-Rhine-Westphalia is used as a proxy for The Ruhr. S. Poland used as proxy for Silesia. Data for Northern Moravia not available.



CASE STUDY – THE RUHR: smoking

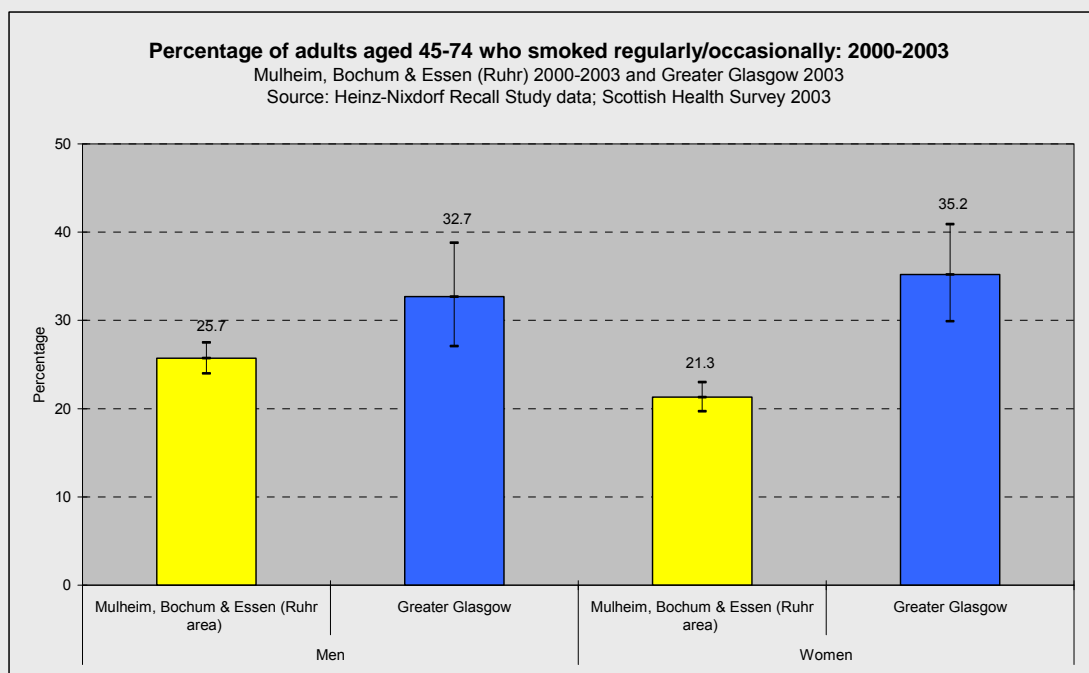
Figure 3.87 shows that at a sub-regional, district level, total adult smoking rates within the Ruhr area were similar to those within WCS. For example, in 2003-05, the smoking rates reported for the cities of Dortmund (33.7) and Glasgow City (34.0) were almost identical.

Figure 3.87



However, the data presented in Figure 3.87 conceal differences in smoking rates by age and gender between the regions. The Heinz-Nixdorf Recall Study (HNR) and Scottish Health Survey can be used to compare smoking rates among 45-74 year old men and women in the two regions. Greater Glasgow (used as a proxy for WCS) had a significantly higher percentage of male and female current smokers in this age group (Figure 3.88).

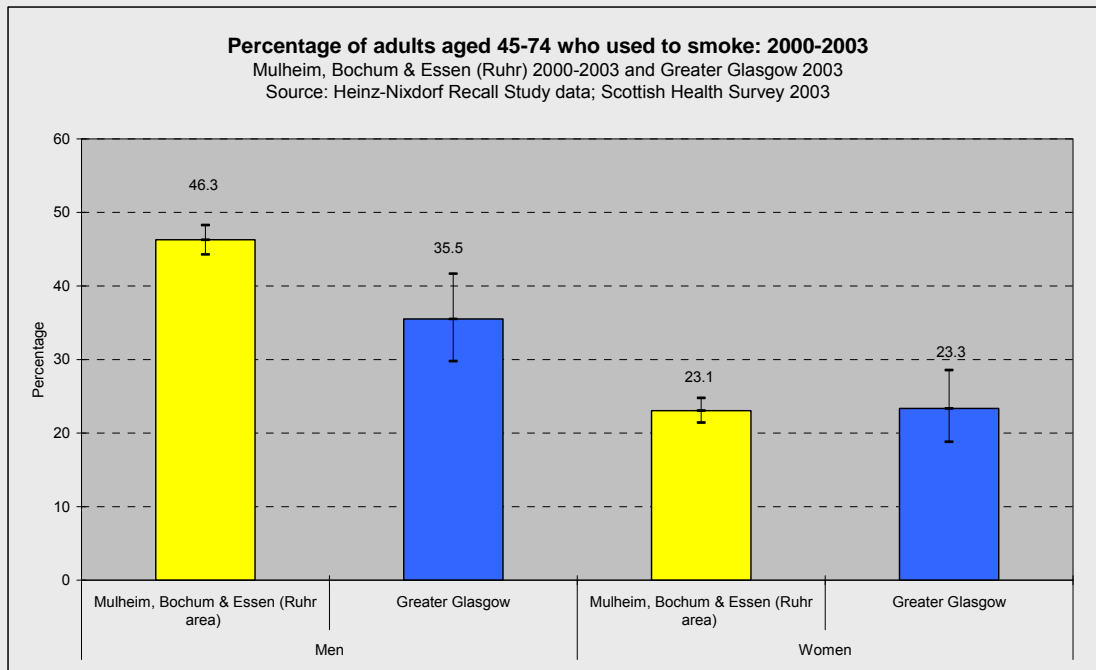
Figure 3.88



Sample sizes: HNRS 2000-2003 (3 cities) – 2388 men and 2416 women; Scottish Health Survey 2003 (Greater Glasgow) – 241 men and 317 women.

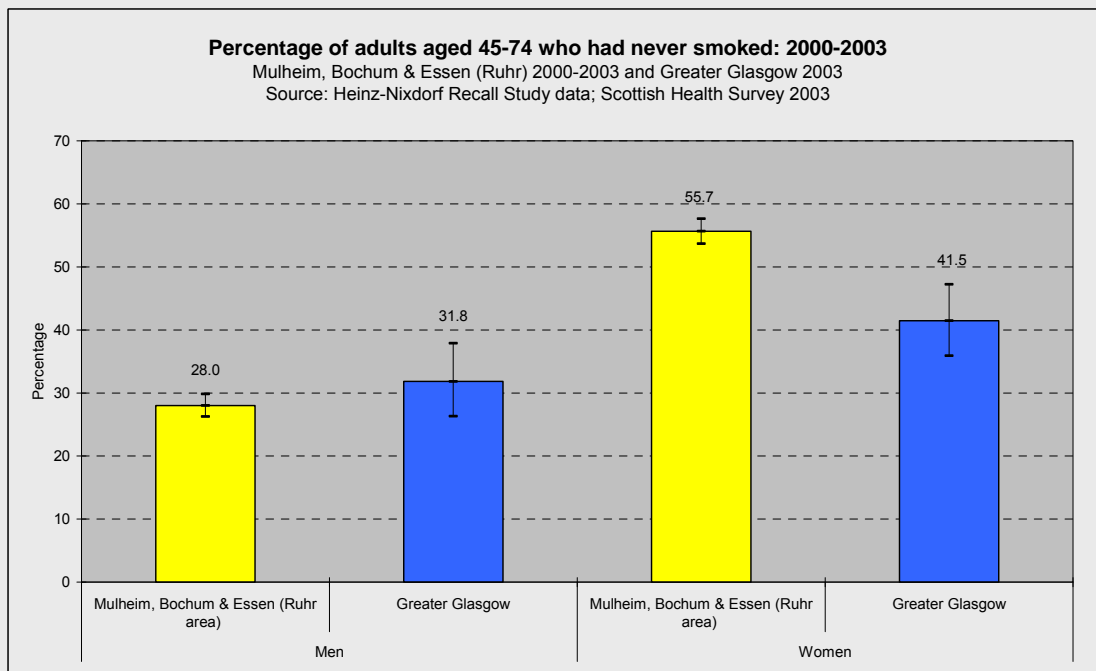
The Scottish region also had a significantly lower percentage of male ex-smokers (Figure 3.89) and a lower percentage of females who had never smoked (Figure 3.90). The latter suggests that not only are current smoking rates higher for middle-aged people in Greater Glasgow compared to the Ruhr area, smoking was also higher historically for women in the Scottish region.

Figure 3.89



Sample sizes: HNRS 2000-2003 (3 cities) – 2388 men and 2416 women; Scottish Health Survey 2003 (Greater Glasgow) – 241 men and 317 women.

Figure 3.90



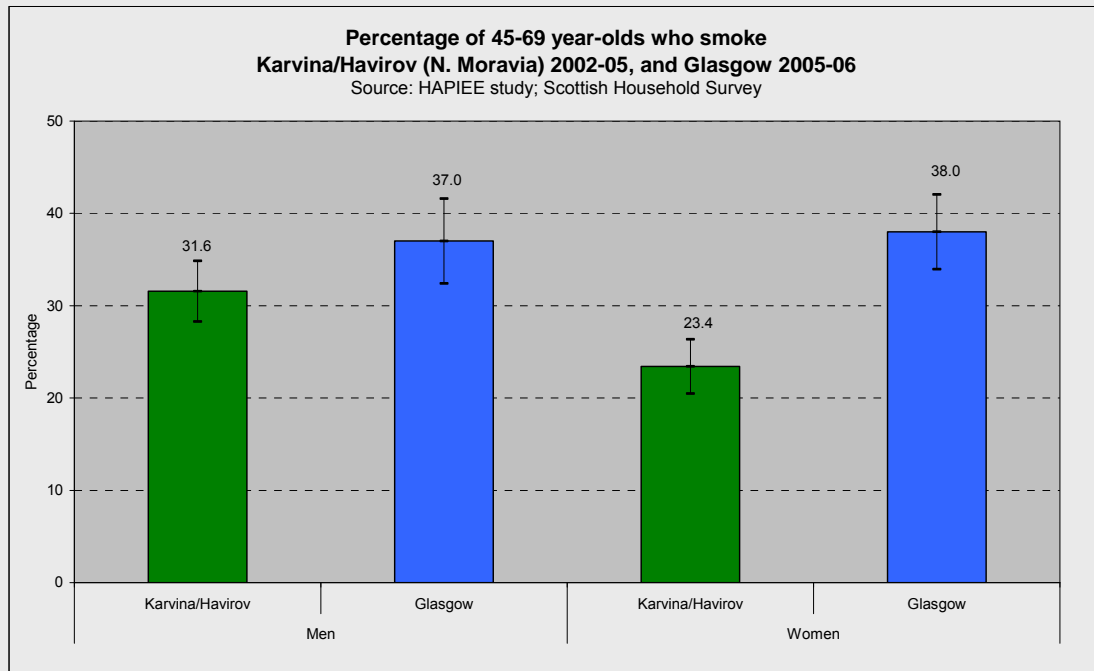
Sample sizes: HNRS 2000-2003 (3 cities) – 2388 men and 2416 women; Scottish Health Survey 2003 (Greater Glasgow) – 241 men and 317 women.



CASE STUDY – NORTHERN MORAVIA: smoking

Analysis of smoking rates in the HAPIEE study revealed that female smoking rates were substantially higher in the city of Glasgow than in the Northern Moravian cities of Karvina/Havírov. For men in this age group, the difference in smoking rates was not statistically significant (Figure 3.91).

Figure 3.91



Sample sizes: HAPIEE: men=773, women=794, Scottish Household Survey: men=425, women=551.

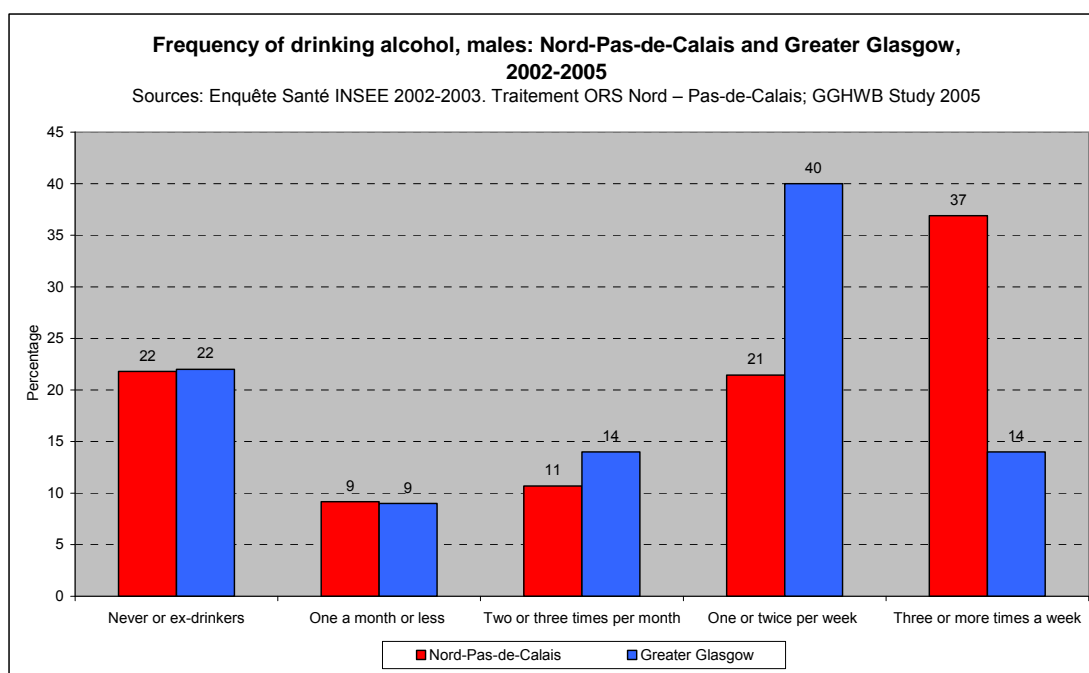
Alcohol

Comparable data on alcohol consumption were not available for the vast majority of regions of interest, making it difficult to compare drinking habits across all the post-industrial regions. However, the first 'Aftershock' report highlighted that mortality from chronic liver disease and cirrhosis – one indicator of alcohol-related harm – was very high in WCS compared to the other regions, and had increased sharply in the 1990s. This section uses the available data to contrast selected aspects of alcohol consumption in WCS with a small selection of regions: Nord-Pas-de-Calais in France, the Ruhr area in Germany, and Northern Ireland.

Drinking frequency: Nord-Pas-de-Calais

Figure 3.92 compares the self-reported frequency of male alcohol consumption in Nord-Pas-de-Calais and Greater Glasgow. Both regions contain a similar proportion of men who never drank/were ex-drinkers, who drank alcohol once a month or less, or who drank two or three times a month. The key differences are in the proportions drinking once or twice a week (much higher in Greater Glasgow: 40% v. 21%) and those drinking three or more times a week (much higher in Nord-Pas-de-Calais: 37% vs. 14%). A similar regional difference was also observed for women. In part this may reflect cultural differences, with daily drinking with meals more common in the French region, and concentrated drinking at the weekend more common in Scotland¹³³.

Figure 3.92

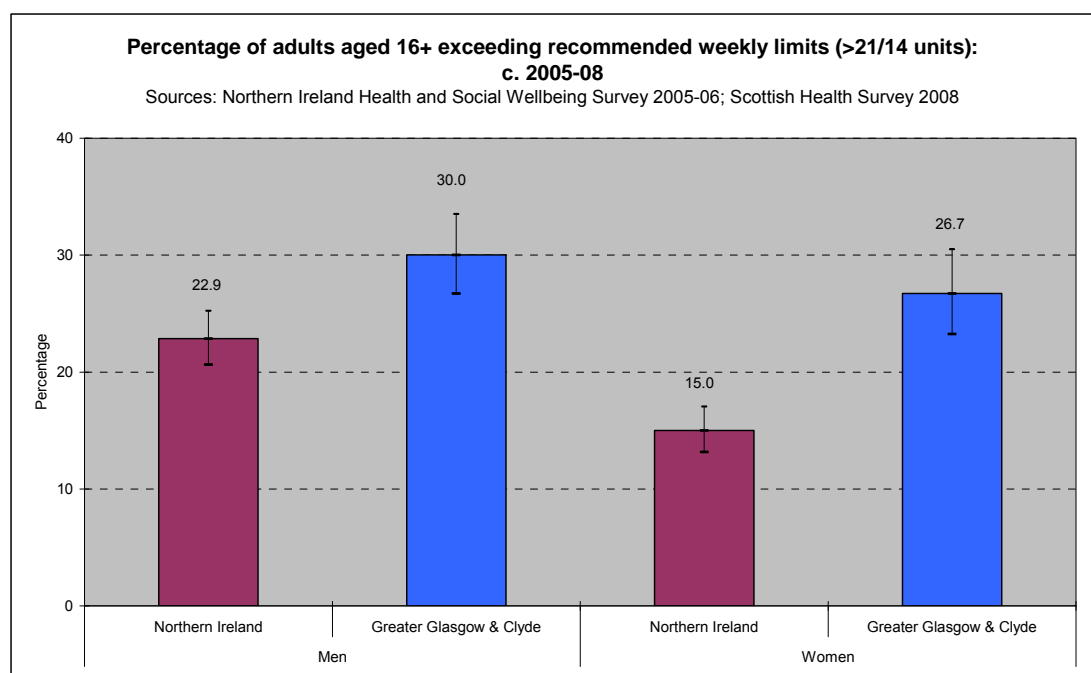


Sample size: Nord-Pas-de-Calais= 1023, Greater Glasgow=808.

Exceeding weekly alcohol limits: Northern Ireland and the Ruhr cities

Here the measures used refer to the percentage of men (and women) in each region drinking more than the recommended weekly limit of alcohol units: 14 for women and 21 for men. Both men and women in Greater Glasgow & Clyde were significantly more likely to exceed these limits compared to their peers in Northern Ireland (Figure 3.93). In 2008, 30.0% of men and 26.7% of women in the Scottish region drank more than 21/14 units per week, significantly higher than the 22.9% and 15.0% reported for Northern Ireland.

Figure 3.93

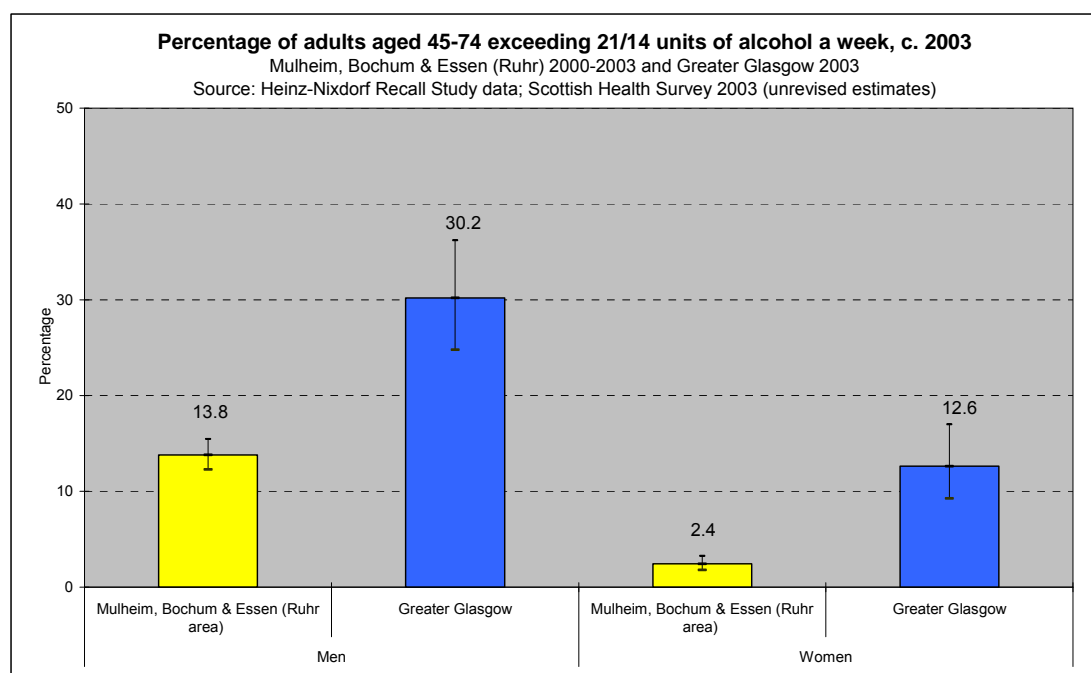


Sample size: Northern Ireland=1391men and 1824 women, Greater Glasgow & Clyde=505 men and 650 women.

The Heinz-Nixdorf Recall Study also recorded information on the detailed drinking habits of 45-74 year olds in three Ruhr cities, allowing comparisons to be made with Greater Glasgow. Figure 3.94 shows that in the period 2000-03 a much higher percentage of older adults in the Scottish region were exceeding the recommended 21/14 units of alcohol per week than was the case in the German cities. Among 45-74 year-olds, a third of men (30.2%) and more than one in ten women (12.6%) in Greater Glasgow were exceeding this threshold in 2003. Much lower figures of 13.8% and 2.4% were recorded for Mulheim, Bochum & Essen. Note that the figures for Greater Glasgow do not reflect the revisions to the calculation of Scottish Health Survey alcohol consumption data that were adopted in 2008, and thus may understate the true extent of this consumption gap^{lxxxix}.

^{lxxxix} ONS published a revised method for converting volumes to alcohol units in 2007, reflecting better estimates of alcohol strength, increased strength of wine and increases in serving sizes of wine served on licensed premises. The Scottish Government used these figures to update data from the 2003 Scottish Health Survey in 2008. See: <http://www.scotland.gov.uk/Publications/2008/05/27092504/1>.

Figure 3.94



Sample sizes: HNRS 2000-2003 (3 cities) – 1797 men and 1728 women; Scottish Health Survey 2003 (Greater Glasgow) – 241 men and 314 women.

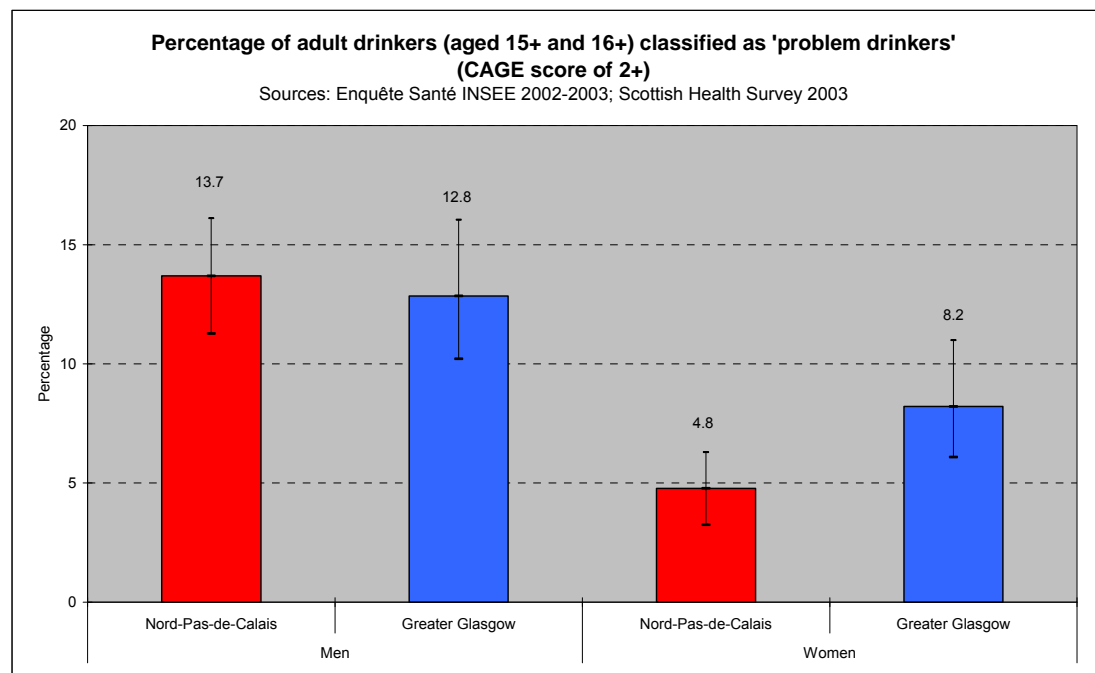
Problem drinking: CAGE scores in Nord-Pas-de-Calais and Northern Moravia

One obvious question is whether the higher rates of alcohol mortality in WCS reflect a greater number of ‘problem’ drinkers in the population or a population-wide issue. This cannot be answered directly, but it is possible to compare a subjective measure of problem drinking, the CAGE score, in Greater Glasgow with Northern Moravia and Nord-Pas-de-Calais. CAGE uses responses to four survey questions^{lxxxii} to create a score from 0-4: a score of 2+ would indicate a possible alcohol dependency problem.

^{lxxxii} The four CAGE questions are: have you ever felt you should **C**ut down on your drinking?; has anyone ever **A**nnoyed you by criticising your drinking?; have you ever felt **G**uilty about your drinking; and have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (**E**ye-opener)?.

Results for Nord-Pas-de-Calais are shown in Figure 3.95. The percentage of adult male drinkers with a CAGE score of 2+ was not significantly different in Greater Glasgow from Nord-Pas-de-Calais (13.7% vs. 12.8%). The percentage of female drinkers with a high CAGE score was significantly higher in the Scottish region (8.2% vs. 4.8%)^{lxxxiii}.

Figure 3.95

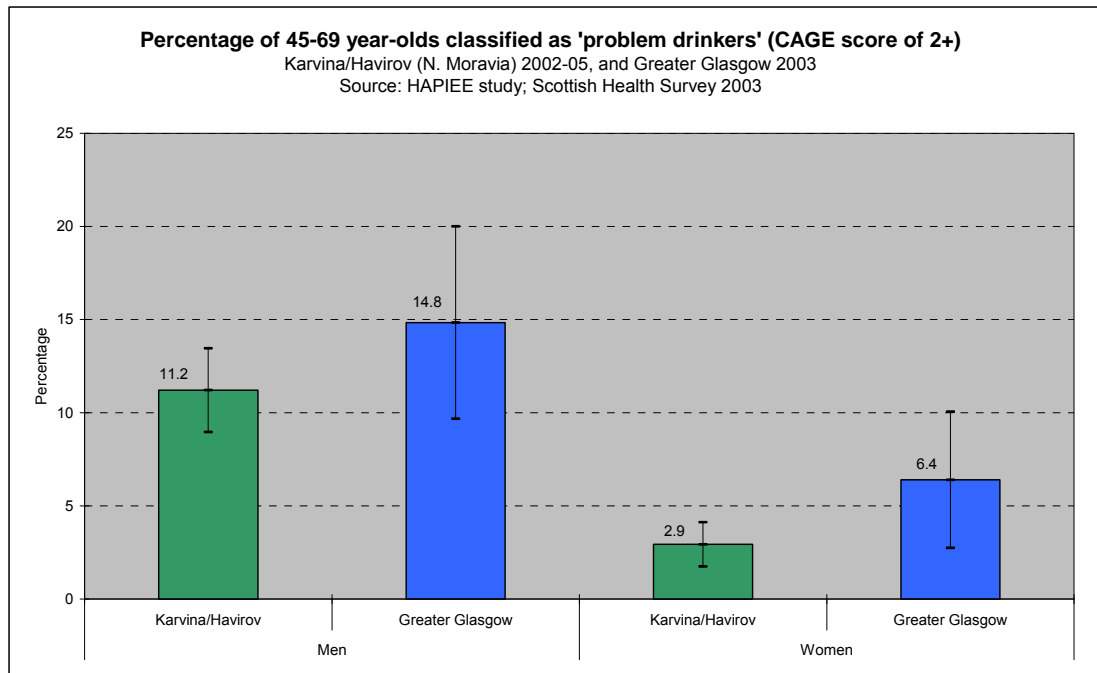


Sample sizes: NPdC: men=826, women=779, Scottish Health Survey 2003 (Greater Glasgow): men=427, women=474. Note: Non-drinkers and those who did not respond to all four CAGE questions in SHeS were excluded from the base.

Using the HAPIEE study, similar comparisons (this time for adults aged 45-69) can be made between Greater Glasgow and the two Northern Moravian cities of Karviná and Havirov. Figure 3.96 shows that a higher percentage of both male and female respondents in Greater Glasgow obtained a score of two or more: however, the relatively small sample size means that the differences cannot be considered significant.

^{lxxxiii} Note that Figure 3.95 shows overlapping 95% confidence intervals for the two measures. However, using the Chi-squared test for proportions, the samples were significantly different ($p < 0.02$).

Figure 3.96



Sample sizes: HAPIEE: men=758, women=783, Scottish Health Survey 2003 (Greater Glasgow): men=173, women=189. Note: Those who did not respond to all four CAGE questions in SHeS were excluded from the base.

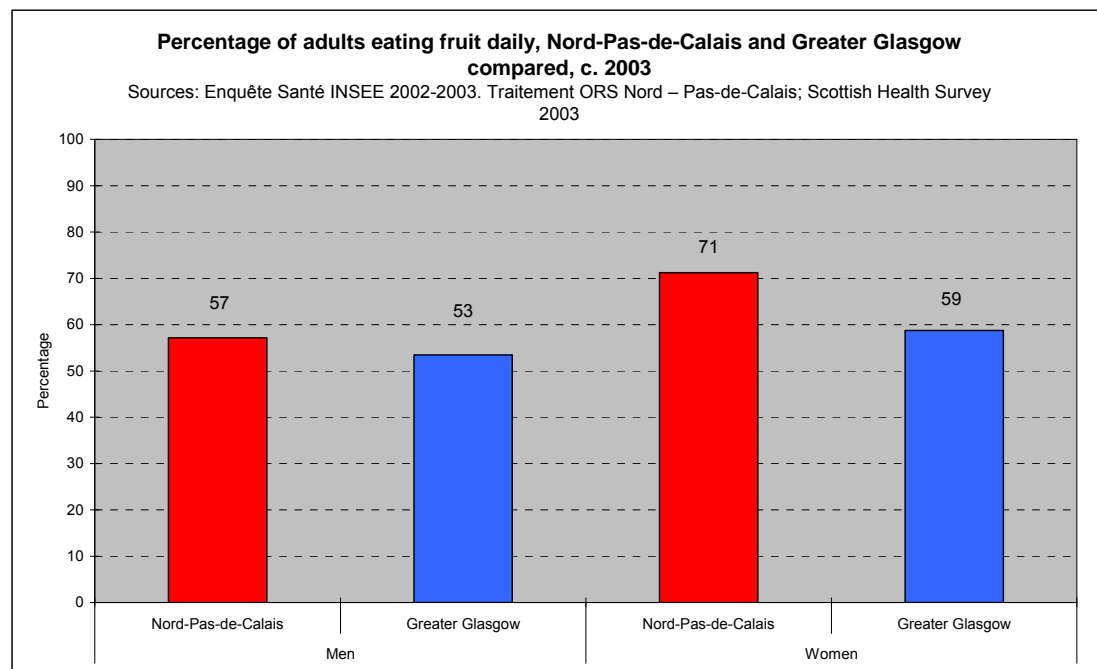
Diet

Limitations in availability and compatibility of data make it difficult to compare and contrast diet across all the regions. However, it is possible to compare selected aspects of diet in WCS with Nord-Pas-de-Calais, certain UK regions and (for older adults aged 45-74) the Ruhr area.

Dietary habits in Nord-Pas-de-Calais appear more conducive to health than those in Greater Glasgow. For example, in 2002-2003:

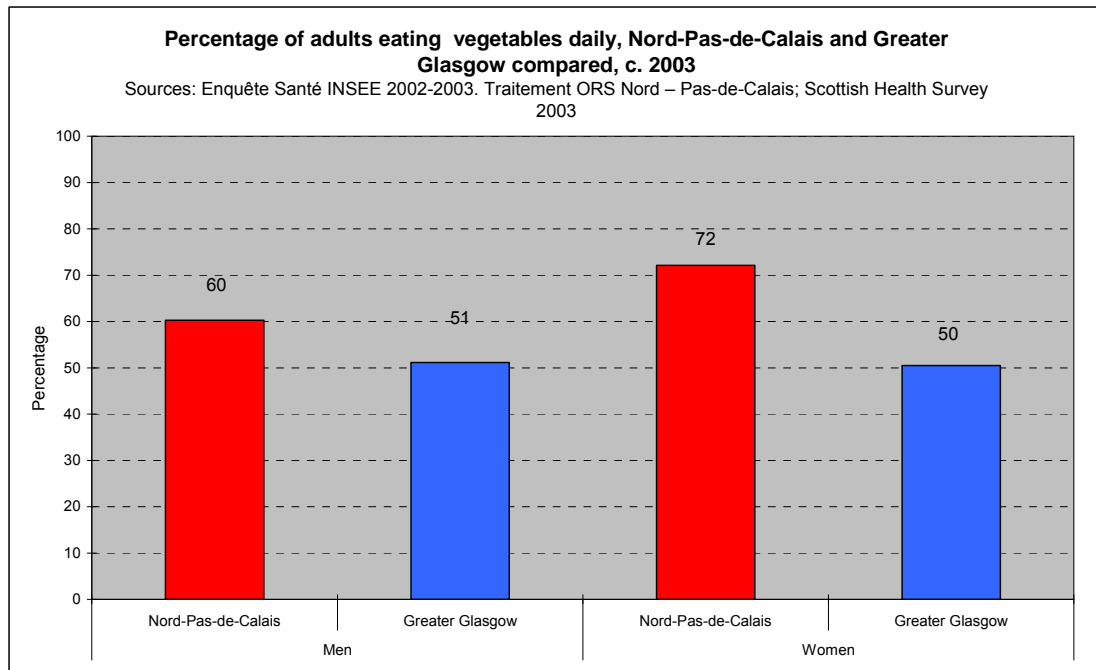
- Adult women in Nord-Pas-de-Calais were substantially more likely than their peers in Greater Glasgow to report eating at least one portion of fruit on a daily basis – 71% vs. 59%. (Figure 3.97).
- Adults of both genders in the French region were substantially more likely to report that they ate vegetables every day (Figure 3.98).
- In Nord-Pas-de-Calais, 58% of men and 65% of women reported eating fish at least once a week; in Greater Glasgow the figures were 22% and 23% respectively (Figure 3.99).
- Consumption of non-diet soft drinks was higher in the Scottish region. A third of men (34%) and nearly a quarter of women (23%) reported drinking non-diet soft drinks every day or nearly every day in Greater Glasgow, compared with 25% and 14% respectively in Nord-Pas-de-Calais (Figure 3.100).

Figure 3.97



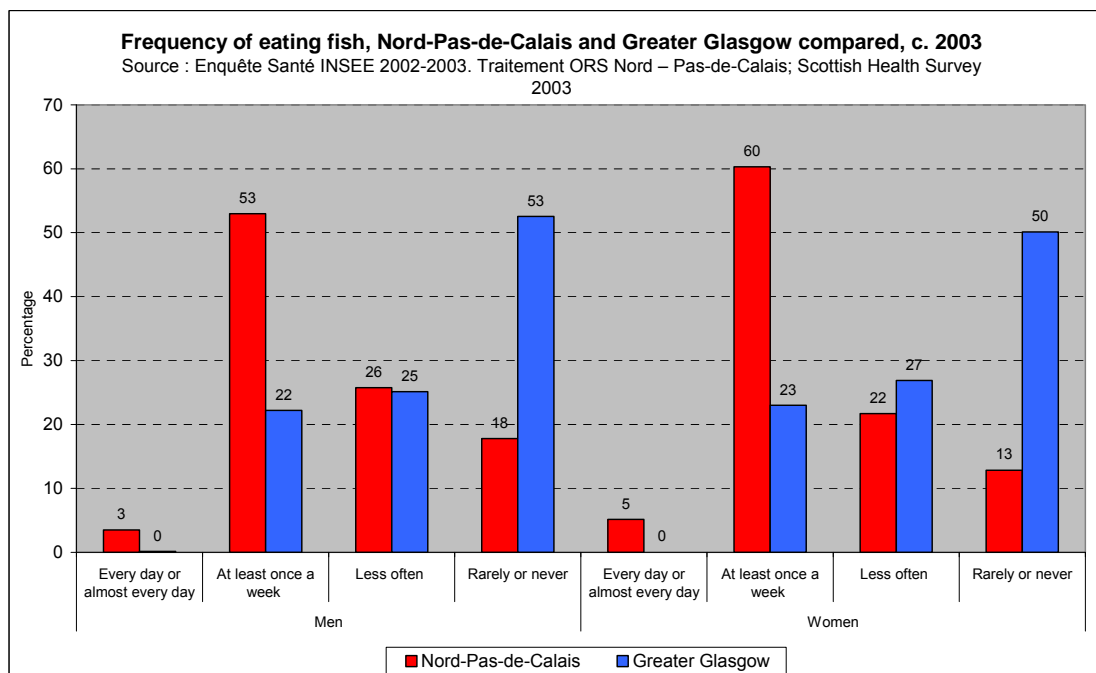
Sample sizes: NPdC= 1224 men and 1357 women, Greater Glasgow=553 men and 707 women.

Figure 3.98



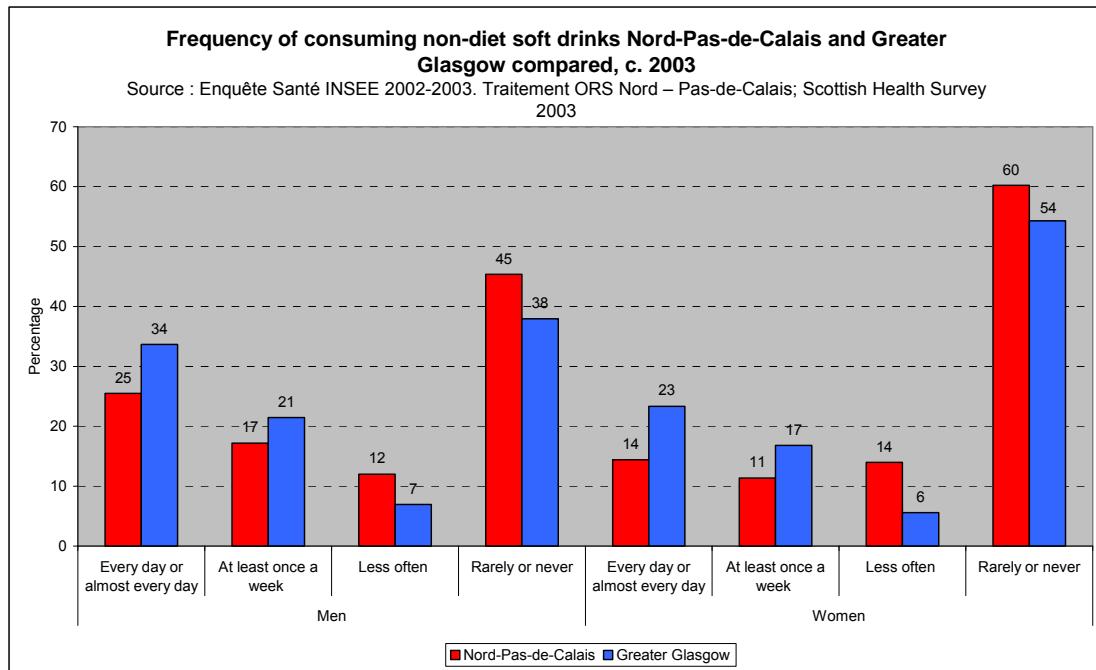
Sample sizes: NPdC= 1224 men and 1357 women, Greater Glasgow=553 men and 706 women.

Figure 3.99



Sample sizes: NPdC= 1224 men and 1357 women, Greater Glasgow=551 men and 704 women.

Figure 3.100

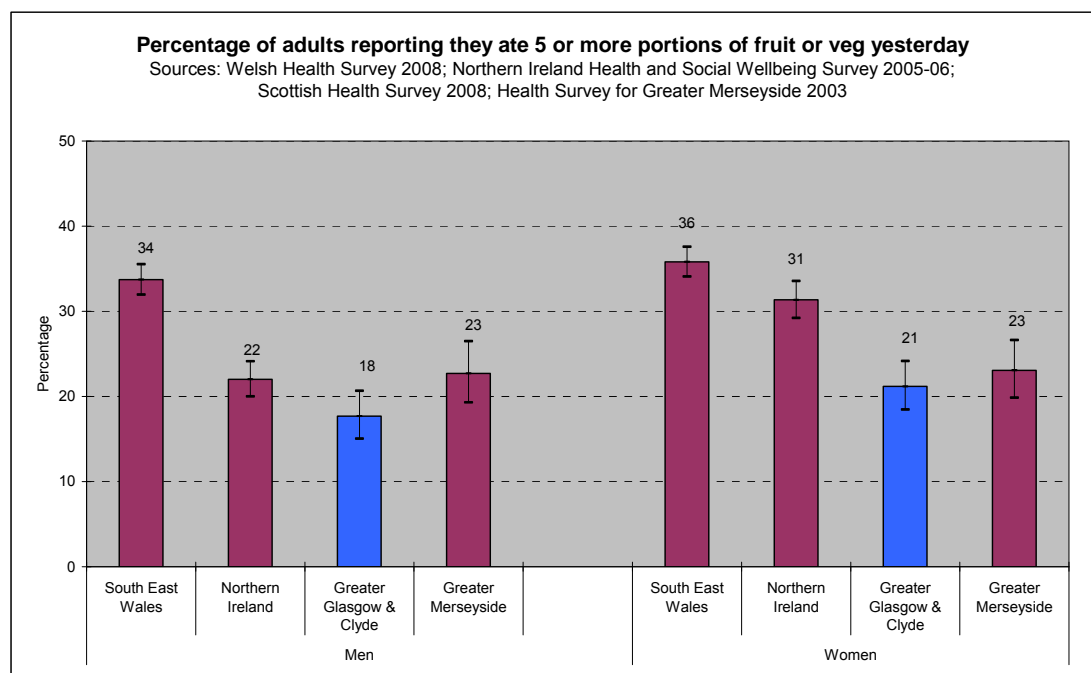


Sample sizes: NPdC= 1224 men and 1357 women, Greater Glasgow=550 men and 703 women.

Survey data also support the view that dietary habits are healthier in certain other post-industrial UK regions. Figure 3.101 shows that the percentage of men meeting the ‘five a day’ target for fruit or vegetables intake^{lxxxiv} was higher in Northern Ireland, Greater Merseyside and South East Wales (the latter significantly so) than in WCS (here Greater Glasgow & Clyde). For women the percentage meeting the ‘five a day’ target was considerably (and significantly) higher in Northern Ireland and South East Wales than in Greater Glasgow & Clyde; however, no significant difference was detected for Greater Merseyside.

^{lxxxiv} Current UK Government recommendations are to consume at least five 80g portions of fruit and vegetables each day, usually expressed as five portions of fruit or veg. See: <http://www.nhs.uk/livewell/5aday/pages/5adayhome.aspx/>

Figure 3.101



Sample sizes: South East Wales=2381 men and 2861 women, N. Ireland=1747 men and 2598 women, Greater Merseyside= 511 men and 602 women; Glasgow and Clyde=511 men and 659 women. Greater Glasgow & Clyde used as proxy for WCS; SE Wales used as a proxy for Swansea & the S. Wales Coalfields.

This last point confirms that dietary habits in WCS do not always compare badly with other post-industrial regions. Recent city-based analyses showed that the percentage of adults meeting the ‘five a day’ target for healthy eating was remarkably similar in Greater Glasgow, Manchester and Liverpool¹⁴.

Obesity

Rising levels of obesity are of public health concern in Scotland¹³⁴ and across Europe¹³⁵. National analyses suggest levels of obesity in Scotland are higher than in many European countries¹³⁶.

Ideally it would be valuable to compare levels of adult obesity across the post-industrial regions. However, data on height and weight, used to calculate the Body Mass Index (BMI) scores that allow us to compare obesity, are not collected in a consistent way across countries and regions. Some countries rely on self-reported data only, others use measured height and weight only, while a few have both measures available. As discussed in several of the

case study reports, self-reported measures of obesity are less accurate than measured estimates, because people tend to understate their weight and overstate their height. This means that 'true' comparisons of obesity can only be presented for a handful of regions.

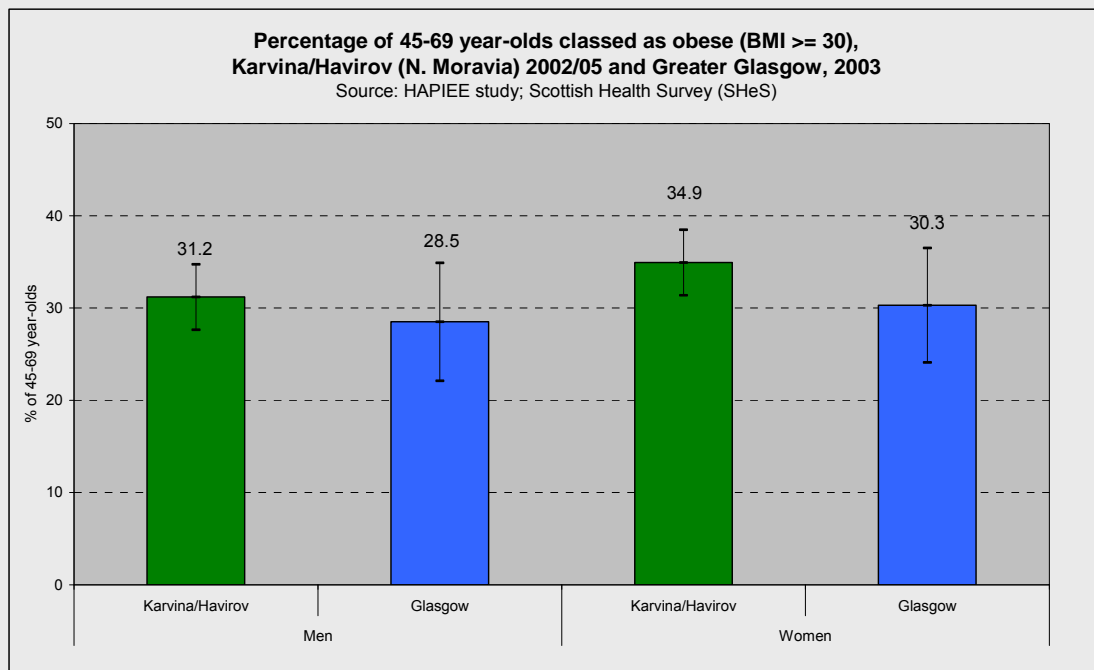


CASE STUDY – NORTHERN MORAVIA: Obesity

Northern Moravia data come from the HAPIEE study. The comparative WCS data use figures for Greater Glasgow from the 2003 Scottish Health Survey.

As Figure 3.102 below shows, levels of measured obesity among middle-aged adults in the two regions are very similar. Although figures are slightly higher among residents of the Czech cities, the differences are neither statistically significant nor substantial.

Figure 3.102



Sample sizes: HAPIEE: men=654, women=690, Scottish Health Survey: men=467, women=410.

Summary: Health behaviours

- Male **smoking** rates in WCS are similar to many of the European regions.
- However, smoking rates for women in WCS are higher than the majority of the other post-industrial regions.
- Limited comparative analyses of **alcohol** data suggested that:
 - Patterns of drinking in Nord-Pas-de-Calais are different to those seen in Greater Glasgow, with adults in the Scottish region more likely to report drinking on one or two days a week and those in the French region more likely to report drinking every day.
 - Alcohol consumption levels among 45-74 year-olds are higher in Greater Glasgow than in the German Ruhr cities of Mulheim, Bochum & Essen.
 - Data suggest there may be higher proportions of female 'problem' drinkers in Greater Glasgow compared to Nord-Pas-de-Calais in France.
- Similarly limited data on **diet** showed that:
 - Adult dietary habits appear better in Nord-Pas-de-Calais compared to Greater Glasgow, with more frequent consumption of fruit, vegetables, fish and less frequent consumption of non-diet soft drinks.
 - Men in Greater Glasgow & Clyde (GGC) appeared less likely than their counterparts in S.E. Wales, Merseyside and Northern Ireland to be eating five or more portions of fruit and veg per day. For women, consumption of fruit and vegetables in GGC was lower than S.E. Wales and Northern Ireland but no different from Merseyside.
- Differences in the way data are collected internationally make it very difficult to compare **obesity** levels for all but a handful of regions. Comparisons with the Northern Moravian region suggest obesity rates among middle-aged adults are similar in both regions.

3.9 Child and maternal health

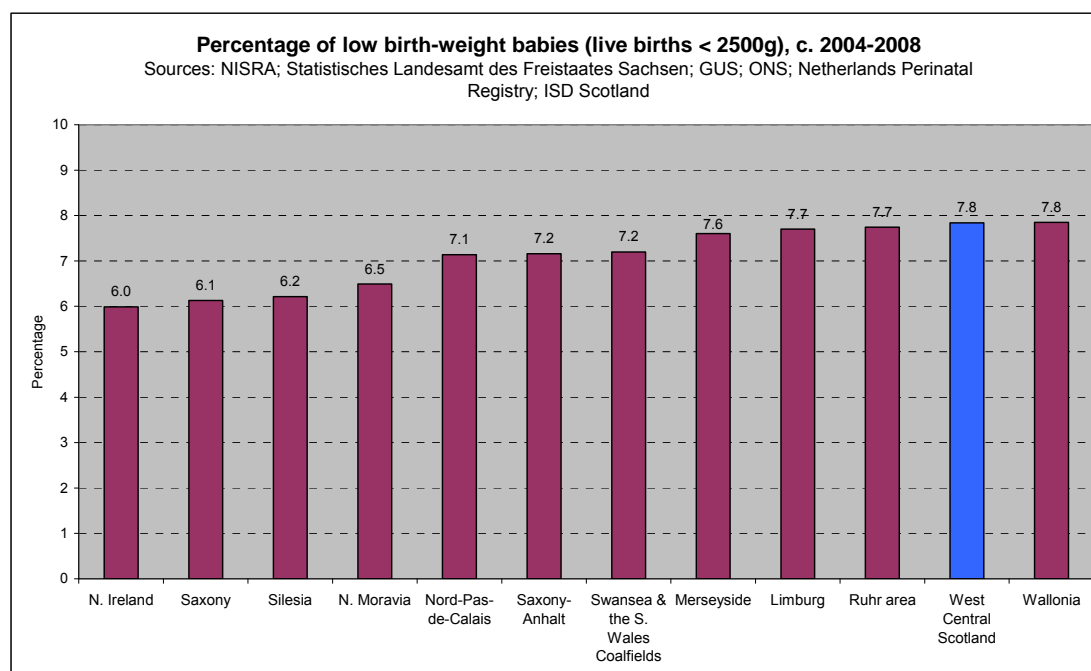
Introduction

Previous research identified a number of areas of concern in relation to child and maternal health in West Central Scotland⁷. Some data relevant to this topic – e.g. lone parent households, marital status – are presented earlier in this report, and suggest that WCS differs from the majority of the other post-industrial regions in these terms. In this section we examine additional information relating to child and maternal health to establish if there are other, potentially important, differences between WCS and other post-industrial parts of Europe.

Low birth-weight babies

Figure 3.103 presents the percentage of births in each region that were of low birth-weight (defined as less than 2500g). For the most recent period for which comparable data are available, WCS is towards the upper end of the spectrum, with a similar percentage of low birth-weight babies as Wallonia, the Ruhr and Limburg. The figures were notably lower in Northern Ireland, Saxony, Silesia and Northern Moravia.

Figure 3.103

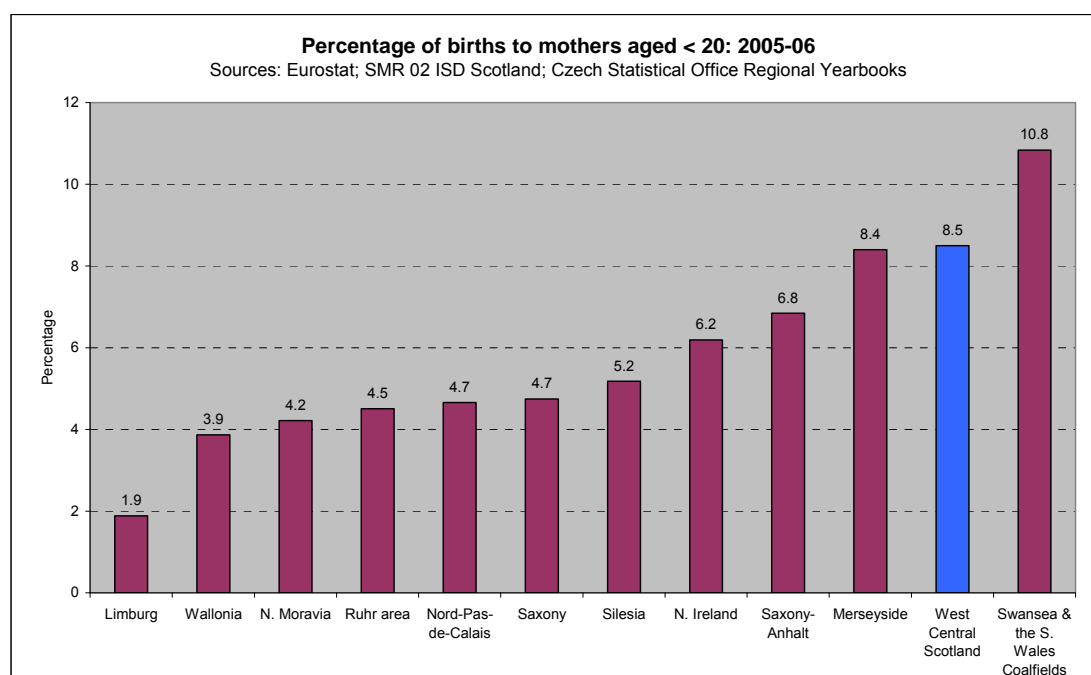


Births to teenage mothers

Teenage mothers are at greater risk of giving birth to pre-term and low birth-weight babies¹³⁷, with a number of known associated health risks¹³⁸. Research has also suggested links between younger parents and other adverse health related outcomes.^{139,140}

Figure 3.104 shows that in 2005-06, 8.5% of births in WCS were to teenage mothers (under the age of 20). This is higher than everywhere except the Swansea & S. Wales coalfields – although the figure in Merseyside is almost identical to that of WCS.

Figure 3.104



Note: figure for the Ruhr shown is an average for the regions of Dusseldorf, Munster and Arnsberg^{lxxxv}.

^{lxxxv} Note: these three regions cover all of the Ruhr area, but additionally cover other parts of (more rural) North-Rhein-Westphalia.

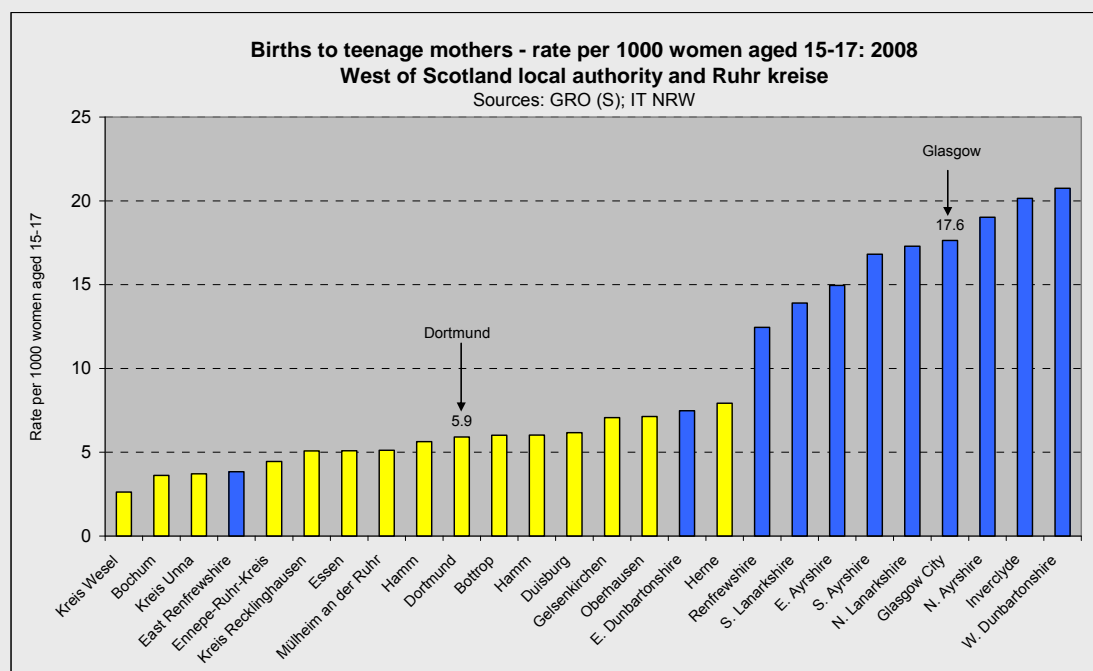


CASE STUDY – THE RUHR: Teenage mothers

We can examine this issue in more detail with reference to the Ruhr case study. As shown earlier, the Ruhr has a relatively high percentage of lone parent households, similar to that seen in WCS. However, Figure 3.104 above shows that a much lower proportion of births in the region are to teenage mothers compared to WCS. What do district level comparisons show?

Figure 3.105 shows the number of mothers aged 15-17 (expressed as a rate per 1000 females of that age) for each of the eleven WCS local authority areas and the 15 Ruhr districts (*kreise*) in 2008. With the exception of East Dunbartonshire and East Renfrewshire, the rate of teenage motherhood is much higher in every WCS local authority compared to every Ruhr *kreis*. Indeed, in 2008, the rate of teenage motherhood was more than two and a half times higher in Glasgow (the largest city of WCS) than in Dortmund (the largest city in the Ruhr).

Figure 3.105



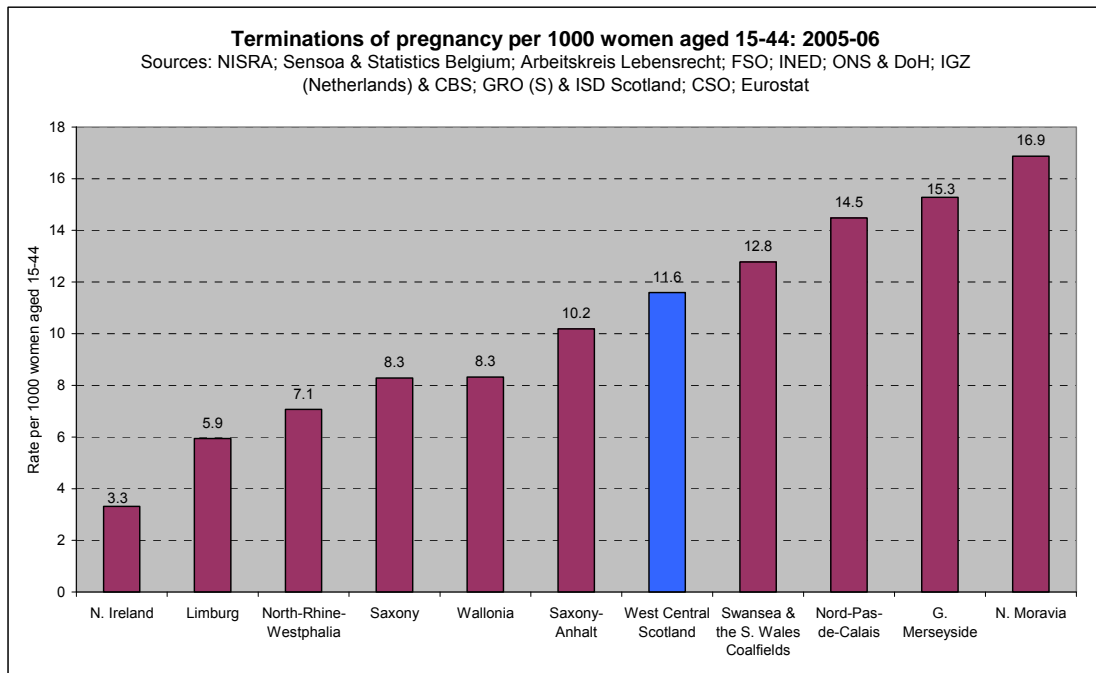
Terminations of pregnancy

Different legal requirements and different cultural contexts make it difficult to compare abortion statistics across different countries. The gestational limits at which terminations of pregnancy can legally be carried out differ across our countries of interest, as do the reasons for abortion permitted by law. For example, in the UK regions (including WCS) terminations of pregnancy are legally allowed up to 24 weeks' gestation; in the majority of the other regions the limit is twelve weeks. However, terminations of pregnancy can be granted for a broader set of reasons in some of these countries than is the case in the UK^{141, 142}.

With these caveats in mind, Figure 3.106 shows the rate of terminations of pregnancy in 2005-06 for the majority of the post-industrial regions of interest. In WCS the rate was 11.6 per 1000 women aged 15-44. This was high compared to the German and Benelux regions but lower than the two mainland UK regions, Nord-Pas-de-Calais and Northern Moravia.

(Note, however, that the relatively high figure for Merseyside may be influenced by numbers of Irish residents staying in the English region to obtain the procedure: it has been estimated that more than 5,000 Irish women per year travel to the UK to have an abortion^{143,144,145}).

Figure 3.106



Greater Merseyside used as proxy for Merseyside.



CASE STUDY – NORTHERN MORAVIA: Termination of pregnancy rates

The gestational limits at which terminations of pregnancy can be performed differ between WCS and the Czech region of Northern Moravia: 24 weeks in the former, 12 weeks in the latter. However, terminations of pregnancy can be granted for a wider set of reasons in the Czech Republic compared to the UK: for example, abortions are available ‘on request’ in the Czech Republic, but not in the UK.

Figure 3.106 above showed that termination of pregnancy rates among women aged 15-44 are higher in Northern Moravia than in WCS. What is of particular interest, however, is the contrast in rates over time. Figure 3.107 shows that rates in WCS increased steadily throughout the 1980s and 1990s, while in Northern Moravia rates peaked in the late 1980s (at a very high rate), but then decreased considerably from the 1990s onwards. While the termination of pregnancy rate in Northern Moravia was more than eight times higher than WCS in the late 1980s, it is now just 50% higher. Note that – and as discussed in the Northern Moravian case study – this decrease in the Czech region has been attributed principally to wider availability of reliable contraception and better sex education^{146, 147}.

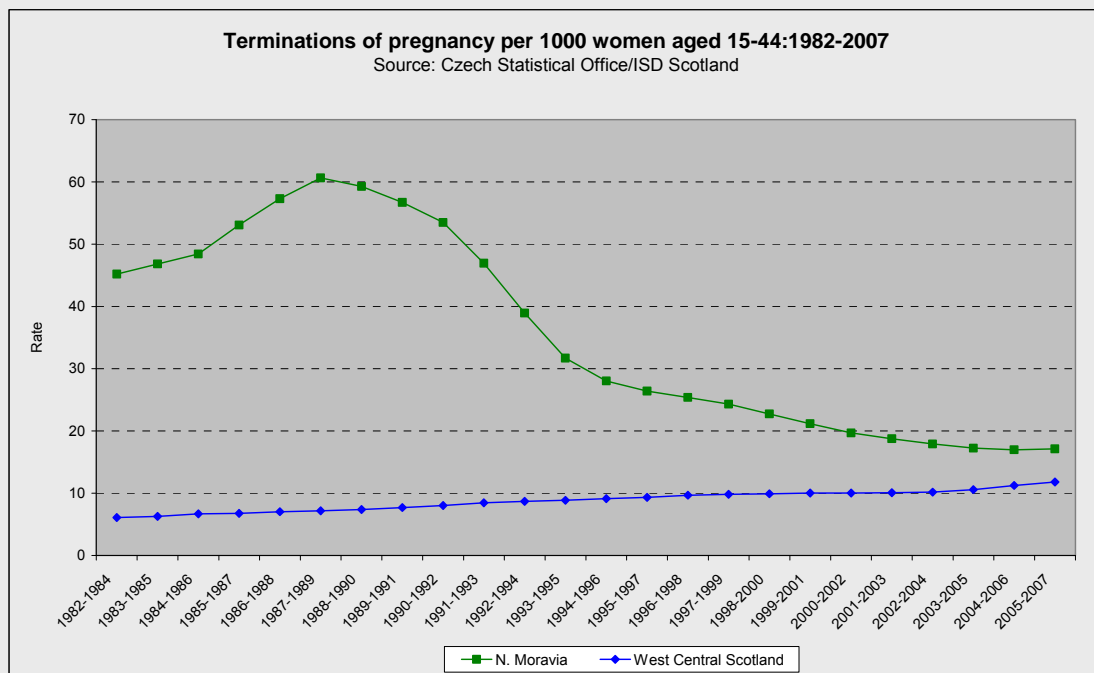
Sub-regional analyses show that, for this age group, the termination of pregnancy rate of every WCS local authority area was lower than every comparably sized Northern Moravian district (Figure 3.108). Even Glasgow City, which had the highest rate in the Scottish region, had a lower rate than that seen in the Czech region (for example, lower than the comparable Ostrava-město conurbation on this measure (14.0 per 1000 vs. 17.7 per 1000)).

Restricting the age group to teenagers reveals a quite different picture. Figure 3.109 shows that among women aged 13-19^{lxxxvi}, the WCS termination of pregnancy rate in the period 2005-07 was more than twice that of Northern

^{lxxxvi} Note that for reasons of data availability, numbers of teenage (13-19) terminations of pregnancy are shown as percentages of 15-19 year-olds (rather than 13-19 year olds)

Moravia (20.6 per 1000 vs. 8.7 per 1000). This is the opposite of the situation in the early 1990s, when rates were considerably higher in the Czech region for this age group.^{lxxxvii} Figure 3.110 shows that this higher teenage abortion rate is seen in all WCS sub-regions compared to their Czech equivalents. For example, rates in Glasgow city were more than double those recorded for Ostrava-město (25.6 per 1000 vs. 11.7 per 1000).

Figure 3.107



^{lxxxvii} Note that although teenage abortions increased in WCS over this period, the rate of all teenage *conceptions* remained fairly stable.

Figure 3.108

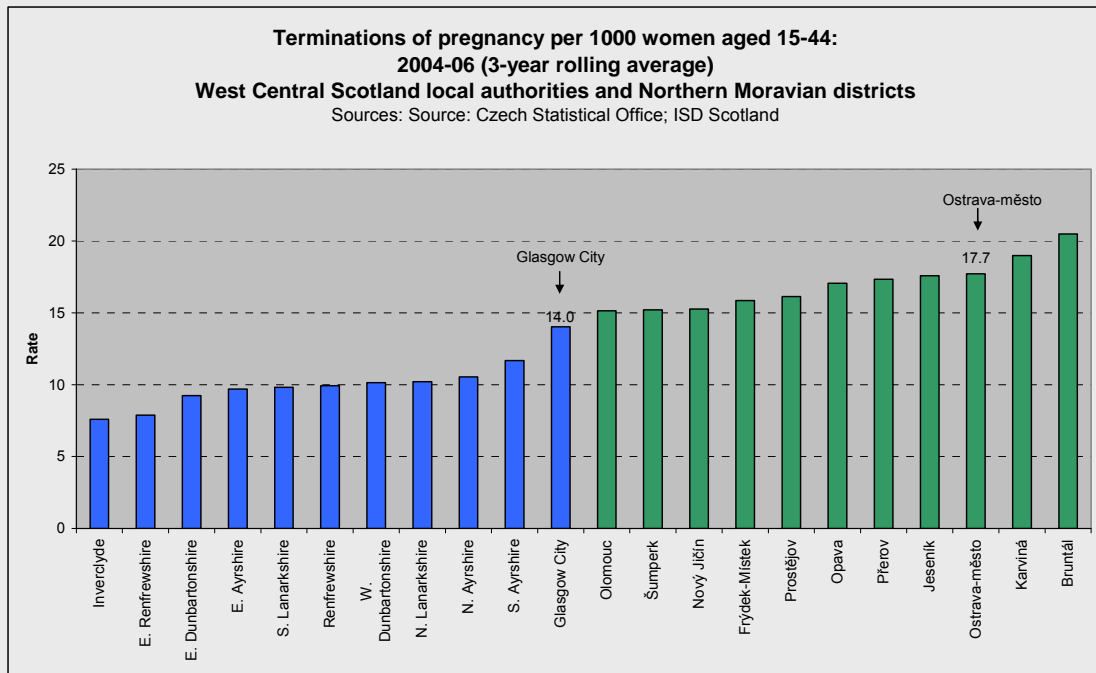


Figure 3.109

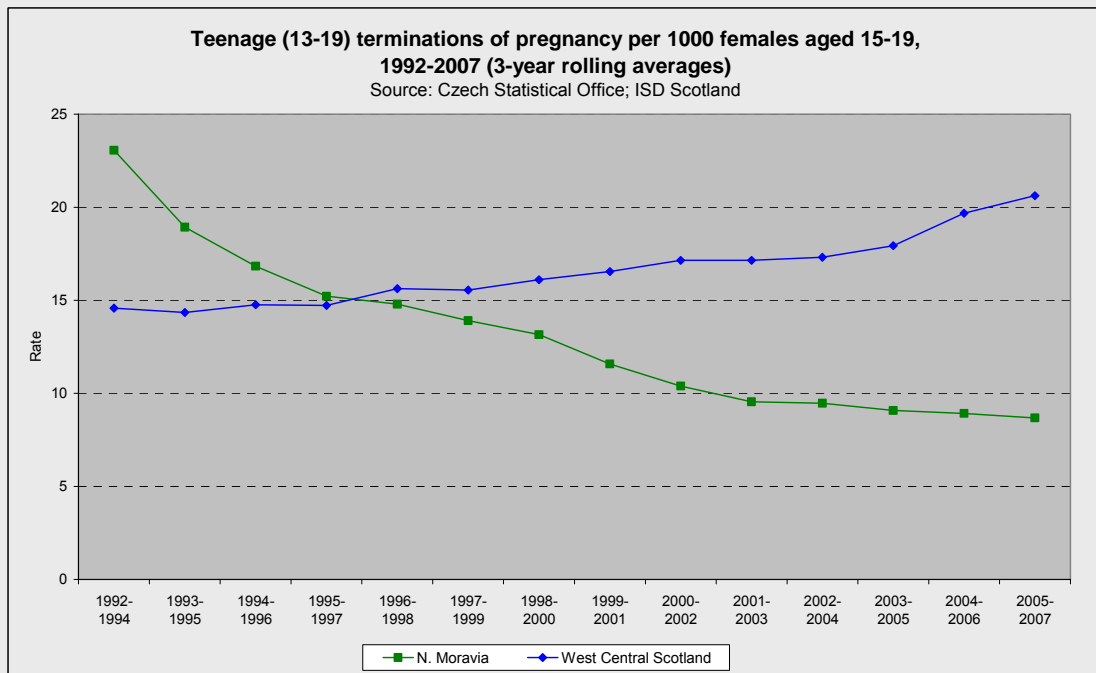
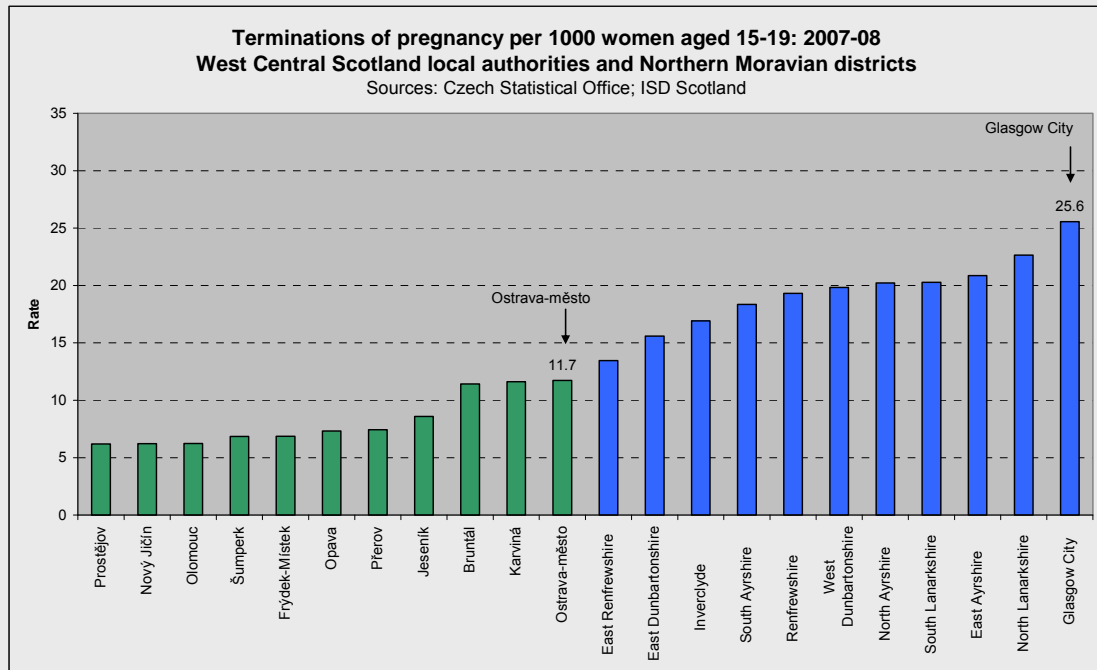


Figure 3.110



Breastfeeding

Breastfeeding confers important health benefits on infants and mothers, providing protection against childhood infection and illness, and a range of other nutritional, psychosocial and developmental benefits^{148, 149, 150, 151, 152, 153, 154}.

Although comprehensive regional data on breastfeeding are not available, we can make some comparisons at a national level. Data from 2004 show that around 30% of babies were breastfed at three months of age in Scotland. This was far lower than in other small European nations such as Portugal (63%), Austria (72%), Finland (76%), Sweden (87%) and Norway (88%)¹. Other measures of breastfeeding also show that Scotland compares unfavourably with countries included within this study such as the Czech Republic, Netherlands, England, Germany, and Poland^{155, 156, 157}.

Sub-national data are available for Nord-Pas-de-Calais and the UK regions, allowing us to look at WCS more directly. At eight to ten days after birth, nearly half (49.7%) of babies were breastfed in Nord-Pas-de-Calais in 2005/06, a figure substantially higher than the 38% reported for WCS. This is shown in Figure 3.111.

Other comparisons (in this case in relation to breastfeeding at birth, rather than at eight to ten days) can be made between WCS and the other UK post-industrial regions. As can be seen in Figure 3.112, this shows WCS in a more favourable light: in 2008-09 the percentage of babies breastfed in WCS was very similar to that recorded in Merseyside, and higher than that seen in Swansea & the S. Wales Coalfields.

Figure 3.111

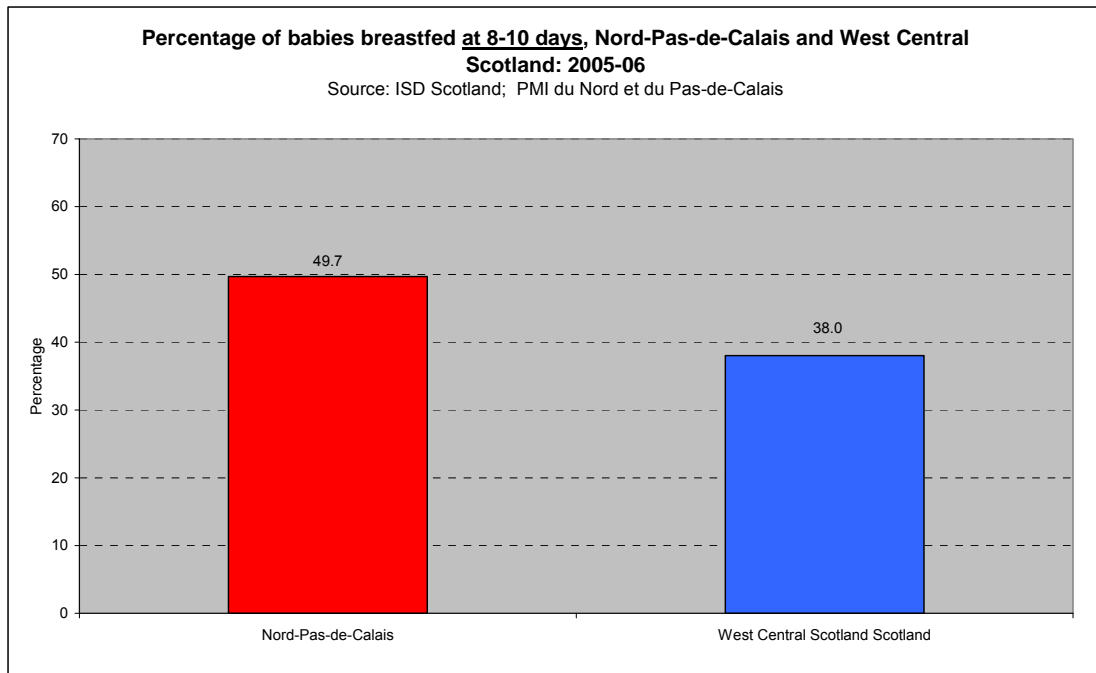
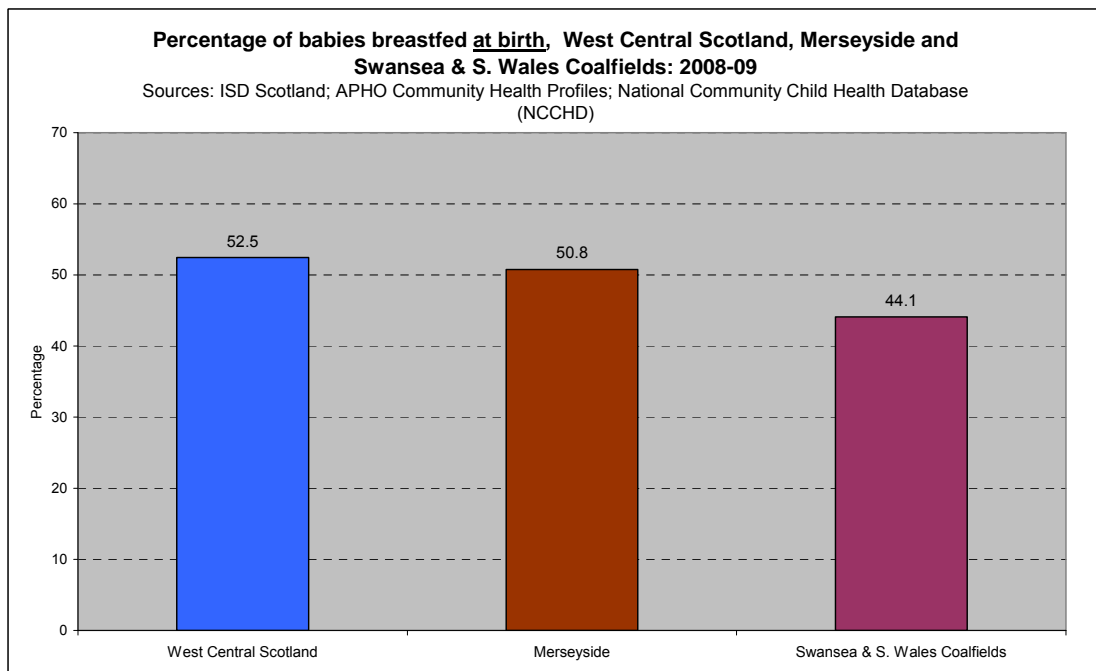


Figure 3.112

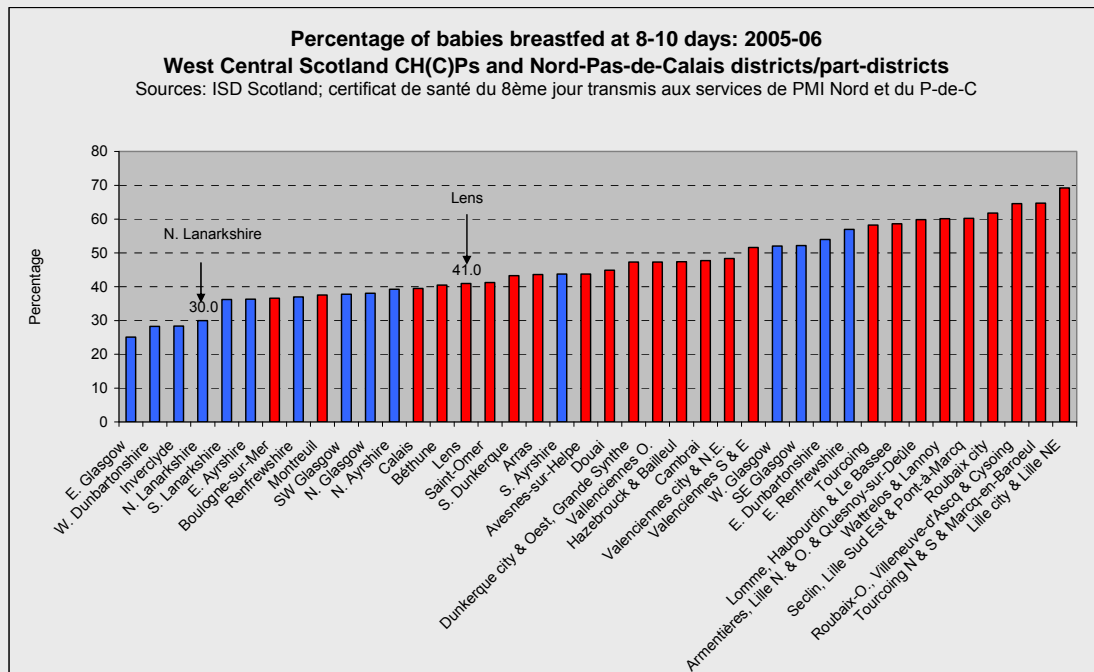




CASE STUDY – NORD-PAS-DE-CALAIS: Breastfeeding

Figure 3.113 shows the percentage of babies breastfed in Nord-de-Calais districts/part-districts and comparably sized WCS CHP areas. Some WCS CHPs (East Renfrewshire, East Dunbartonshire, S.E. Glasgow and W. Glasgow) have rates comparable to many Nord-Pas-de-Calais districts, but in general rates tend to be higher across the whole of the French region. This can be illustrated with the example of Lens and N. Lanarkshire, two sub-regions whose economies were both built on coalmining and steel: the breastfeeding rate in Lens, although low in Nord-Pas-de-Calais terms, was eleven percentage points higher than N. Lanarkshire in 2005-06.

Figure 3.113



Summary: Child and maternal health

- Along with Merseyside, WCS had the second highest rate of births to **teenage mothers** of any of the regions compared. Only in Swansea & the South Wales Coalfields was this rate higher.
- At 7.8%, the percentage of WCS **low birth-weight** births was relatively high compared to many other European post-industrial regions (Saxony, N. Ireland) but on a par with the Ruhr and Wallonia.
- The termination of pregnancy rate in WCS was moderate in a European context, higher than that seen in the three German regions, Northern Ireland, Wallonia and Limburg but lower than other British regions, Northern Moravia and Nord-Pas-de-Calais. However, national comparisons of termination of pregnancy statistics remain problematic because of important differences in eligibility criteria and legal requirements.
- Limited data on rates of **breastfeeding** suggest WCS rates to be lower than Nord-Pas-de-Calais, but on a par with other UK regions.

Part Four: Discussion and conclusions

Introduction

Part One of this report presented two overarching research questions:

1. Can WCS's relatively poorer health status be explained purely in terms of socio-economic factors (poverty, deprivation etc.)?
2. Do comparisons of other health determinant information identify important differences between WCS and other regions?

In Part Four we discuss the extent to which the analyses of data assembled in this report convincingly answer these questions. We also consider the potential impact of important contextual factors in the regions (i.e. particular historical, political and broader economic influences) which may help explain some of the report's findings. Finally we discuss other potential explanations for WCS's enduring poor health status – including those currently under investigation as part of a related research programme.

Is it all about absolute levels of income and poverty?

Taking all the data presented in this report together, the answer must be 'no'. At a *regional* level, the data fail to convince that this is a feasible explanation. Although for some individual indicators, and in relation to certain specific regions, WCS appears relatively worse off (for example: male worklessness in comparisons with Limburg; young adults not in education, employment or training (NEETS) in comparisons with Nord-Pas-de-Calais^{lxxxviii}), taken as a whole the data do not show the WCS to be the poorest, or even among the poorest, of the regions analysed. For the most recent available data, WCS compares better than the majority of regions in terms of employment, unemployment, and perceived adequacy of income.

^{lxxxviii} NEETS data are presented within the Nord-Pas-de-Calais case study.

The individual case studies further reinforce this impression. For example, lower rates of unemployment are seen across all parts of WCS compared to virtually all comparably sized sub-regions of Nord-Pas-de-Calais, The Ruhr, Northern Moravia and Silesia/Katowice.

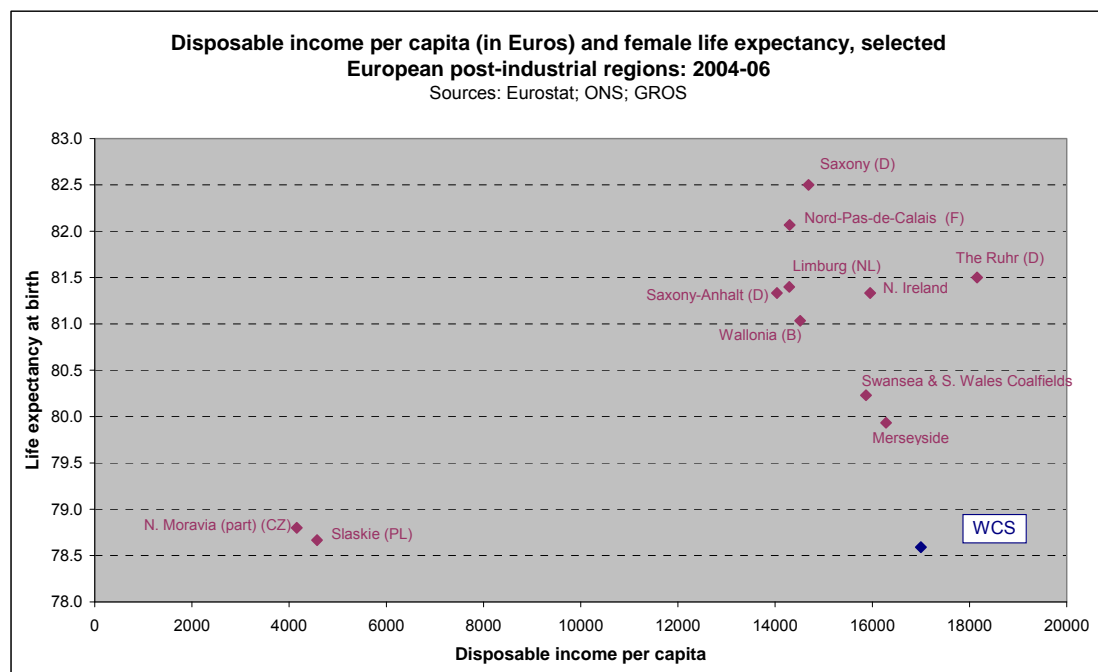
Nor do the available time series data provide a convincing picture that trends in income and poverty are sufficient by themselves to explain WCS's poor health. From the 1980s onwards employment and unemployment trends in WCS improved relative to the West European regions over time. In the 1990s, the East European regions experienced a traumatic adjustment in their economies – yet all these regions saw their life expectancies increase at a faster rate than WCS. Crucially – and as we discuss further below – Merseyside was exposed to similar levels of deindustrialisation as the Scottish region (with economic and labour market outcomes that were in some ways worse), and within the same UK economic climate of sharply rising income inequality, but still experienced much lower mortality rates.

The much more detailed analyses of income deprivation and mortality in relation to the post-industrial cities of Glasgow (in WCS), Belfast (in Northern Ireland) and Liverpool (Merseyside) discussed in section 3.3 (and published previously¹³) provide the clearest indication that explanations other than purely socio-economic ones are required. The deprivation profiles of Glasgow and Belfast, and in particular Glasgow and Liverpool, are strikingly similar; and even when the data have been fully adjusted for any remaining differences in levels of area-based deprivation (as measured using very small geographical units), premature mortality in Glasgow is still 36% higher than in Liverpool^{lxxxix}, and 27% higher than in Belfast.

^{lxxxix} Note that this is an unpublished figure. The published data referred to above compared Glasgow to combined data for Liverpool and Manchester, and in that case premature deaths in Glasgow were 31% higher.

As we discuss in more detail below, the overall regional profile of WCS is very similar to a number of other post-industrial regions in relation to a range of important health determinants. However, it is not similar in relation to health outcomes (mortality) and in terms of the rate at which health is improving. There appears to be a ‘disconnection’ between measures of wealth and health in WCS. Figure 4.1 below plots income per capita against female life expectancy for the twelve regions. In general terms, the wealthier regions have higher life expectancy. This is not the case for WCS: in these terms the region is an outlier.

Figure 4.1



What about *relative poverty* and *income inequalities*?

The ‘outlier’ status of WCS presented in Figure 4.1 above begs an obvious question: although indicators such as income per capita suggest WCS is wealthier in absolute terms, are the health outcomes driven by greater *inequalities* in income and wealth within WCS (and Scotland) compared to the other regions?

Wilkinson's hypothesis^{63,64,66} that less equal societies suffer from worse overall levels of health and well-being is important in this context. This report has shown that, on the basis of some measures, there is evidence that WCS may be more unequal in these terms: Section 3.4 showed that levels of relative poverty in WCS are greater than in the majority of the other regions, and income inequality (as measured by the Gini coefficient) is greater in Scotland than in many of the other 'parent' countries, and is higher in WCS compared to the mainland European regions.

However, these findings are complicated by the fact that levels of inequality do not appear to be particularly different in other UK regions such as Merseyside: for example relative poverty rates are similar, and the 'index of dissimilarity' (Section 3.3.) is slightly higher in Merseyside. Furthermore, as highlighted above, at a city level inequalities in area-based levels of deprivation in Glasgow and Liverpool are virtually identical. Mortality, however, is considerably higher in WCS compared to Merseyside, and in Glasgow compared to Liverpool.

Therefore, although the higher levels of income inequality and relative poverty are potentially important findings, they do not appear to fully explain the excess levels of poor health seen in WCS.

What about other health determinants?

One of the difficulties in undertaking comparisons of similar post-industrial regions – i.e. regions which have all suffered the economic, social and health impact of the loss of large sections of their employment base – is that it can be hard to identify clear differences between the regions. Distinctions that are obvious in comparing – for example – a country's poorest and wealthiest populations will always be less apparent in making comparisons between the same 'type' of regions.

Figure 4.2 presents a summary of some of the key indicators included within sections 3.1-3.9. It is an attempt to summarise the extent to which WCS is similar to, or different from, the other post-industrial regions in terms of these various measures of health and its determinants. The chart shows, for each indicator, the number of regions that WCS is a) 'worse' than (in red); b) similar to (yellow); c) 'better' than (green). Thus, for the first example of male life expectancy, this measure is 'worse' (i.e. lower) in WCS compared to seven regions, similar to two regions, and 'better' (higher) than two regions^{xc}. This is only intended to be a *very approximate* presentation of relative differences in the data for WCS. Note also that not all the indicators presented in this report are included: the selection has been principally based on the indicators for which a 'subjective judgement' could be made (i.e. that it is 'worse' to have poorer health; that it is 'better' to have high levels of educational attainment).

^{xc} Where indicators have 95% confidence intervals calculated, the 'better', 'similar' and 'worse' categories have been allocated with regard to overlapping/non-overlapping confidence intervals. Thus, as Figure 2.6 showed in Section 2.2, male life expectancy is actually higher in Nord-Pas-de-Calais than in WCS; however, the 95% intervals for the NPdC rate overlap with those of the WCS rate. Thus we have termed this 'similar'. The same approach has been used for all survey data included in the Figure which had available 95% confidence interval information. When 95% confidence intervals were not available, subjective judgements have been used to determine whether values in WCS were sufficiently 'better' (higher or lower depending on the indicator), similar or 'worse'. Of course, a proper study of statistical significance would be based on specific statistical tests: however, the intention here is simply present a *very approximate overview* of differences between regions, rather than a detailed statistical dissection of the data.

Figure 4.2

Key indicators summary for WCS compared to 11 other post-industrial regions							
	Indicator	Value	Measure	Region	Number of regions that WCS is: worse than, similar to, or better than:	Time Period	Fig
Health & Function	Life expectancy - males	72.8	yrs	WCS		2003-05	2.6
	Life expectancy - females	78.3	yrs	WCS		2003-05	2.7
	Self-assessed health - 'good' or 'very good'	71.8	%	GGC		2008	3.9
	Adults with limiting long-term limiting illness	28.0	%	GGC		2008	3.11
	Mean life satisfaction score	7.3	avg	GGC		2008	3.12
Prosperity & poverty	Male employment rate	74.0	%	WCS		2008	3.24-25
	Female employment rate	62.0	%	WCS		2008	3.26-27
	Unemployment rate	5.8	%	WCS		2008	3.18
	Men aged 25-49 not in employment	21.7	%	WCS		2001	3.28
	Perceived adequacy of income	11.4	%	WCS		2007	3.34
Inequalities	Population living in relative poverty	18.9	%	SWS		2003	3.43
	Income inequality	0.30	Gini	WCS		2003-04	3.41
Social Environment	Lone parent households	31.1	%	WCS		2001	3.56
	Single person households	33.8	%	WCS		2001	3.60
	Adults (25-64) who are married	63.0	%	WCS		2001	3.64
	Education: tertiary (level 5/6) qualifications	33.3	%	SWS		2008	3.52
	Education: no/low (<level 3) qualifications	27.3	%	SWS		2008	3.53
	Social capital - religious participation	52.7	%	WCS		2007	3.67
	Social capital - levels of trust	5.5	avg	Scot		2002-08	3.68
	Social capital - no interest in politics	14.1	%	WCS		2007	3.69
	Social capital - voter turnout	58.3	%	WCS		2005	3.70
Physical Environment	Climate - average annual irradiance	2460	w	G		2005	3.74
	Overcrowding (rooms per head of pop)	2.0	cr	WCS		2001	3.76
	Perception of neighbourhood safety	70.6	%	WCS		2007-08	3.80
Behaviour	Male smoking prevalence	29.9	%	WCS		2003-04	3.85
	Female smoking prevalence	28.4	%	WCS		2003-04	3.86
	Male liver cirrhosis mortality	46.3	sr	WCS		2003-05	a/s
	Female liver cirrhosis mortality	19.6	sr	WCS		2003-05	a/s
Child & Maternal	Births to teenage mothers	8.5	%	WCS		2005-06	3.104
	Low birth-weight babies	7.8	%	WCS		2004	3.103

Key - yrs: years; avg: average score; Gini: Gini coefficient; w: Wh/m2 (Watt hours per square metre); cr: crude rate per head of population; sr: standardised rate (directly aged-standardised rate per 100,000 population); WCS: West Central Scotland; GGC: Greater Glasgow & Clyde; SWS: South West Scotland; Scot: Scotland; G: Glasgow; a/s: presented in first 'Aftershock' report.

Figure 4.2 (and more particularly all the analyses presented in Sections 3.1-3.9) shows that there are a number of indicators where either there is relatively little difference across the majority of the regions, or where WCS is no better or no worse than the majority. This is the case with, for example: some aspects of social capital (e.g. religious participation), aspects of the physical environment (perception of safety; overcrowding), some educational indicators (e.g. no, or low level of, qualifications), and some aspects of reproductive health (fertility rates; termination of pregnancy rates). However, it is clear that WCS differs from the majority of other post-industrial regions (particularly outwith the UK) for a small number of topics or indicators. These are as follows:

- **Inequalities**: aside from the issue of income inequalities and relative poverty discussed above, the data suggest that **spatial inequalities in mortality** may be higher in WCS than the majority of areas. Furthermore, data from the case studies point to particularly wide **spatial inequalities in social indicators**: for example, in relation to educational attainment and vulnerable households.
- **'Vulnerable' households**: the numbers of **single person households**, and **unmarried adults** are proportionally much higher in WCS than in the majority of areas. Given the research evidence of adverse health and well-being attributes associated with such households and individuals, this is a potentially important finding.
- **Child and maternal health**: related to 'vulnerable' households is the significantly higher percentage of **lone parent households** in WCS compared to most other key post-industrial regions. Rates of **teenage pregnancy** or **teenage mothers** also tend to be higher in WCS than in the majority of areas. Higher rates of **low birth-weight babies** in WCS were also noted.

These differences are interesting and potentially important. It is again notable, however, that in the majority of cases, the figures for Merseyside are remarkably similar. For the indicators above, the values for the two regions are as follows (WCS values first):

- single person households: 34% vs. 32.5%
- married adults: 63% vs. 59%
- lone parent households: 31% vs. 33%
- teenage mothers: 8.5% vs. 8.4%
- low birth-weight babies: 7.8% vs. 7.6%

Indeed, one of the noteworthy findings of the study (summarised further in Appendix E) is the remarkable similarity between WCS and Merseyside in relation to the vast majority of all the indicators presented. The regions are not just similar in relation to the indicators highlighted above, but also in relation to: some measures of self-rated health; car ownership; home ownership; income deprivation; male worklessness; income inequality and relative poverty (as mentioned above); smoking prevalence; obesity; fertility rates; voter turnout. This echoes the results of the other research cited above which compared Glasgow and Liverpool, and also found striking similarities between the two cities across a range of health determinant data. This is now the focus for other, on-going, research which is discussed in further detail below.

The regions: historical, political, economic context

In seeking explanations for the some of the results discussed above, but in particular for the poorer health profile of WCS, we must of course not lose sight of other, potentially important, contextual factors. As outlined in Part Two, although all the regions we have examined have a shared history of deindustrialisation, they of course differ in a number of other ways.

At the time of the publication of the initial 'Aftershock' report, it became clear that it was difficult to interpret some of the regions' mortality trends in isolation from their historical, political and economic context. This was especially true of regions outside the UK, about which much less is known. What, for example, was the policy response to deindustrialisation in Nord-Pas-de-Calais in France? How did the Ruhr area in Germany adjust to a post-industrial economy? What was the impact of much faster processes of deindustrialisation in Eastern European regions such as Northern Moravia in the Czech Republic and Katowice in Poland? To ensure these gaps in knowledge are being fully addressed, additional research is being undertaken to accompany the work presented in this report.

Analyses of historical, political and economic factors are being undertaken as a PhD studentship by Gordon Daniels at the University of Glasgow. This is due to be completed by the end of 2011²². To date, a number of important differences between WCS and the other core regions have been identified. For example, with regard to comparisons with *Western* European post-industrial regions, it has been noted that:

- Deindustrialisation appears to have taken place over a longer timescale in WCS compared to the other regions.
- In the face of deindustrialisation, it can be argued that more 'protective' economic policies were implemented in regions such as the Ruhr and Nord-Pas-de-Calais than was the case in WCS.
- More generally, the economic response to deindustrialisation and globalisation was different in the UK to much of the rest of Western Europe. From the early 1980s, the UK Conservative government embarked on a range of what are frequently termed 'neo-liberal' policies: liberalisation of the financial markets; privatisation of public enterprises and state-owned firms; deregulation of business; and adjustment of the labour market through deregulatory policies that reduced the power of trade unions and increased the power of employers. In contrast, the early 1980s in France saw the socialist government of Mitterrand attempt to

increase state intervention via nationalisation and restructuring; this, however, ultimately proved unsuccessful, and although subsequent governments pursued policies similar to those seen in the UK (liberalisation of the market, deregulation of business and labour market flexibility) they were more 'socially inclusive' and not implemented to the same extent. The response of Germany was also different to that of the UK: the German government in the 1990s sought reforms that would promote economic competitiveness, but which also maintained the regulatory role of 'non-market' coordinating institutions i.e. the employers' associations and trade unions that acted as regulatory authorities. The reforms were therefore more gradual and were negotiated between business, labour and regional governments; and although the reforms also included privatisation and deregulation, this was again on a much smaller scale to that seen in the UK.

- Compared to WCS, there were important differences in the management of the processes of deindustrialisation in Nord-Pas-de-Calais: for example in relation to successful attempts to mitigate the effects of job losses.
- It can be argued that areas such as the Ruhr and Nord-Pas-de-Calais have more successfully restructured their economies following deindustrialisation. For example, in Nord-Pas-de-Calais new industries such as glass, automobiles and printing created the foundations for a new industrial culture in the region. Another particular success has been the development of a new mail order industry around the towns of Roubaix and Tourcoing, which was the result of the diversification and restructuring of the previous local textile industry ¹⁵⁸.

Other important differences have been noted in comparison with *Eastern* European regions. For example:

- The regions of Central Eastern Europe (CEE^{xci}) share the problems associated with the industrial 'monoculture' (i.e. the dominance of, and reliance on, heavy industry such as coal and steel) of the Western Europe regions. However, there are important differences in the relevant time periods involved: in CEE this monoculture developed and intensified until the 1980s whereas in Western Europe it was in decline from the 1960s.
- There were important differences in the relationship between employees and the state. In CEE regions workers remained key to socialist development: industrialisation was the foundation of such development, and miners and steelworkers in particular were considered critical to the pursuit of these goals. However, this was not the case in terms of capitalist development in Western Europe. The result of this was that where deindustrialisation occurred (e.g. in Katowice/Silesia in Poland and Northern Moravia in the Czech Republic), sustained confrontations with workers and unions were avoided, as were other problems more associated with longer term decline.
- There are differences not only in the speed (faster) and time period (more recent) of deindustrialisation in CEE compared to WCS, but also clearly in the global and political context: in CEE, deindustrialisation took place both within the developing globalisation of the 1990s and also within the transition to post-Communist rule. Thus there were additional pressures of institutional and social change in CEE compared to the context for deindustrialisation in WCS and the rest of Western Europe.
- Some of the CEE regions attracted significant inward investment compared to Western European regions. This resulted in, for example, a motor industry that was arguably more successful in CEE compared to Western European areas in the 1970s and 1980s.

^{xci} CEE is a term covering the European former Communist states. The latter include Poland and the Czech Republic, plus also: Estonia; Latvia; Lithuania; Slovakia; Hungary; Romania; Slovenia; Croatia; Bosnia-Herzegovina; Serbia; Kosovo; Albania; Montenegro; Macedonia; Bulgaria.

- As already mentioned, some Eastern European regions still have important industrial elements to their economy (including heavy industry such as coal and steel production).

These are important points to bear in mind in relation to interpreting differences in health trends between the regions. Furthermore, this on-going research is likely to highlight a number of important lessons for WCS and other post-industrial parts of Europe in terms of, for example, factors which can best mitigate the effects of employment losses. Such lessons are particularly relevant and important in the current economic climate in the UK and abroad.

Explanatory factors

The first 'Aftershock' report outlined a number of potential hypotheses to explain the relatively poor health profile of WCS. Here we briefly return to those hypotheses to determine the impact of this second phase of research on our knowledge and understanding. In addition, we highlight other hypotheses which have emerged more recently, some of which are now under investigation within a related programme of research.

The hypotheses included in the first 'Aftershock' report were:

- i. that the trends were influenced by **data quality** issues
- ii. that there was a particular **age cohort** driving the trends
- iii. **migration** had a role
- iv. **income inequality** was higher in WCS
- v. adverse **health behaviours** were influential
- vi. WCS was more materially **deprived**
- vii. the trends were influenced by a more **severe dose of deindustrialisation** in WCS compared to the other post-industrial regions.

Some of these were addressed within the first 'Aftershock' report itself:

- Issues around (i) data quality seemed an unlikely explanation, although a more general 'artefactual' explanation in relation to the measurement of deprivation is considered further below.
- Analyses of (ii) age cohort specific mortality trends suggested it was unlikely that one particular cohort had been driving the 'excess' levels of mortality witnessed in WCS. This finding is reinforced by analyses of national^{2,10} and city-based¹⁴ historical trends which suggest that the higher mortality seen in Scotland relative to other European countries (and that seen in Glasgow relative to other UK cities) has developed gradually over the last 60 years, rather than being a more recent development driven by one particular age cohort.
- Analysis of (vii) levels of deindustrialisation confirmed that WCS had experienced a higher proportionate industrial employment loss than the majority of the regions. However, the figure was very similar to that experienced in Merseyside^{xcii}

In this report we have already addressed the issues of (iv) income inequalities and (vi) deprivation. We have also undertaken a number of analyses of (v) health behaviour data: while not all health behaviours in WCS compare badly with those seen in the other post-industrial regions, higher levels of female smoking and higher levels of alcohol-related harm are notable. On the basis of the results of other research^{13, 159, 160, 161, 162, 163} it is likely that drugs misuse is also more prevalent in WCS than in the other regions. Such behaviours are clearly associated with higher rates of mortality. However, as with analysis of any health behaviour data, it is important to look at the 'causes of the causes': if alcohol, tobacco and drugs are seen as 'coping mechanisms' closely linked to the socio-economic circumstances in which individuals live, why are these behavioural factors more prevalent in WCS compared to other regions with higher levels of poverty? Why are alcohol-related deaths two and a half time

^{xcii} Between 1971 and 2005, WCS experienced a 62% decrease in the number of industrial jobs. This was higher than the majority of regions, but the equivalent figure for Merseyside was 63%.

higher in Glasgow than in Liverpool when their deprivation profiles (and histories) appear identical¹³?

The research comparing Glasgow and Liverpool (and also Manchester) has prompted further discussion of possible explanations for the higher levels of Scottish – in this case, Glasgow’s – mortality. These were identified, assessed and summarised in a report published in 2011 by the Glasgow Centre for Population Health¹⁶⁴. In all, seventeen candidate ‘hypotheses’ were identified, ranging from ‘downstream’ health determinants to ‘upstream’ societal phenomena. Some of these have been discussed above, and elsewhere in this report; others are new. The hypotheses were grouped into four principal categories:

1. **Artefactual explanations.** These are: deprivation, and migration. The deprivation hypothesis is that Scotland/WCS actually *is* more relatively deprived in socio-economic terms but we are failing to measure it properly. On the one hand this is a feasible explanation, given the limitations of routine, administrative recording systems. It is also an explanation that has supporters¹⁶⁵. On the other hand, however, ‘excess’ levels of poor health (i.e. over and above those explained by socio-economic factors) have been demonstrated for Scotland, WCS and Glasgow at a number of different levels, and within a number of different analyses: for example, within national-based analyses¹¹; regional analyses¹⁵; analyses using small and very small spatial units of analysis¹⁴; and within analyses based on individual level data^{12, 166, 167}. For these reasons, it seems unlikely that the explanation can be purely artefactual.

The migration hypothesis suggests that there has been a greater degree of emigration of healthy individuals from Scotland/WCS/Glasgow than from other areas. However, recent research has shown that although there has been substantial emigration, recent migrants display a mortality pattern very similar to that of the non-emigrating population^{168, 169, 170, 171, 172}. Thus, it seems unlikely that migration is the driving force being WCS’s poorer health profile.

2. **‘Downstream’ explanations.** These are: poorer health behaviours (discussed above), and different ‘individual values’. The latter suggests that there may be a relatively higher prevalence of individuals who are more hedonistic, or who have lower aspirations, and that this in turn leads to a higher prevalence of adverse health behaviours and higher mortality. This appears plausible, but there is a lack of data whereby it can be proved or disproved. Consequently, this potential explanation is the subject of new, on-going, research discussed below.

3. **‘Midstream’ explanations.** These are numerous: that there is a different culture of substance misuse in Scotland: i.e. the way in which substances (illicit drugs, tobacco and alcohol) are used differs from elsewhere, and/or that there is a unique culture surrounding their use which exacerbates their effects; there is a different culture of ‘boundlessness’ and alienation in Scotland/WCS/Glasgow; there are differences in family, gender relations and parenting which impact on health status in Scotland; there is lower social capital in Scotland/WCS/Glasgow; there is an impact of sectarianism; there is a culture of limited social mobility in Scotland/WCS/Glasgow; there are differences in health service supply or demand; there are differences in the spatial concentration of deprivation in within Scotland and parts of Scotland.

Some of these suggestions (e.g. sectarianism and health service issues) seem unlikely for a number of reasons outlined in the Glasgow Centre for Population Health report¹⁶⁴. Many of the other hypotheses lack robust data and evidence, and are also, therefore, the subject of new research.

4. **‘Upstream’ explanations.** These are: climate (for example in relation to a lack of Vitamin D from lower levels of sunlight); inequalities (discussed within this report); the severity of deindustrialisation (also discussed above); and ‘political attack’ (i.e. poor health is a direct legacy of particular political policies implemented in Scotland in the 1980s¹⁷³).

Again, some of these suggestions are being addressed in the on-going programme of research.

In addition, a fifth category of a **genetic explanation** (i.e. that the WCS population is either predisposed to negative health behaviours, or is particularly vulnerable to the effects of such behaviours due to genotype) is also discussed in the report, but thought to be an unconvincing explanation.

Clearly, however, the answer to this conundrum will be multi-factorial, rather than relating to one single cause.

The programme of research that has been established to test some of these hypotheses is being undertaken by the Glasgow Centre for Population Health and NHS Health Scotland (alongside other colleagues in Scotland and England). It is based on a combination of quantitative and qualitative research in the three post-industrial cities of Glasgow, Liverpool and Manchester. We hope to be able to present the results of all this research in early 2012.

Conclusions

In conclusion, this study has highlighted that:

- The vast majority of the post-industrial regions share important characteristics: deindustrialisation causes economic and social upheaval, and impacts on population health, and this can be seen from a range of administrative and survey data.
- Health in West Central Scotland (WCS) is poorer, and is improving more slowly, than in other comparably deindustrialised regions of Europe.
- This relatively poorer health status cannot be explained in terms of current measures of poverty and deprivation: socio-economic conditions within WCS are similar to, or better than, many regions which have superior health profiles.

- Time series data do not provide convincing evidence that historical poverty is responsible for current poor health outcomes in WCS.
- Compared to other post-industrial regions in mainland Europe, income inequalities in WCS (and in the other UK regions) are greater.
- Health inequalities also appear to be wider in WCS.
- WCS also stands out in terms of a number of social factors: for example, proportionally higher numbers of its population live alone or as lone parents.
- Differences are also apparent in relation to aspects of child and maternal health: for example, there are relatively higher rates of teenage pregnancy and motherhood, and higher numbers of low birth-weight babies in WCS.
- Some of these distinguishing features – e.g. higher income inequalities, more lone parent households, more teenage mothers – are true also of the other UK post-industrial regions. These regions also share a recent economic history different to that experienced elsewhere in Europe.
- Of all the other deindustrialised regions in Europe, Merseyside appears the most similar to WCS: it shares almost all the adverse social and economic characteristics listed above. However, what distinguishes WCS from Merseyside is a poorer health profile.

What emerges from these observations is a picture that is only partially coming into focus. Poorer health in WCS can be attributed to three layers of causation. First, it is a deindustrialised region. This is a fundamental driver of poor health which WCS shares with all other regions that were part of this analysis. Second, by virtue of being part of the UK, WCS has experienced a set of economic policies and social trends which overlap with continental Europe but are, nonetheless, different in important ways. Chief amongst these are the ‘neo-liberal’ economic policies pursued by the UK, higher levels of economic inequality and higher proportions of potentially vulnerable households. The third level has to do with unexplained factors which cause WCS to experience worse health outcomes than similar regions within the UK: in particular, WCS has worse health outcomes than regions like Merseyside which have remarkably similar histories and socio-economic profiles. That is

why the picture is only partially in focus. The investigation into this phenomenon is continuing with a programme of research, focussing on Glasgow and other, comparable, post-industrial cities in England.

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Appendix A: Notes, definitions and sources for data presented in the report

Figure/table	Description	Definition	Sources and notes
Figure 2.1	Map of the 12 post-industrial regions compared in the report.	The 12 regions are West Central Scotland, Merseyside, Swansea & S. Wales Coalfields, Northern Ireland, Nord-Pas-de-Calais, Wallonia, Limburg, the Ruhr, Saxony, Saxony-Anhalt, Northern Moravia and Silesia.	Map produced using boundaries provided with ESRI ArcGIS 9 software.
Table 2.1	Table summarising national location, population, and economic history of 12 regions.	'Industrial Employment Peak' = post-war year in which percentage of people employed in manufacturing (as percentage of all employees) peaked in parent country. Total Industrial Employment Loss = change in employment in manufacturing, construction and utilities between dates shown.	Population data from the following sources: Nord-Pas-de-Calais (INSEE), Katowice (Department of Cancer Epidemiology and Prevention, Cancer Centre and Institute of Oncology, Warsaw), N. Moravia (CSO), Limburg (CBS), Merseyside and Swansea & S. Wales Coalfields (ONS), West Central Scotland (GRO (S)), N. Ireland (NISRA), Ruhr area, Saxony and Saxony-Anhalt (Federal Statistics Office), Wallonia (Eurostat).
Figure 2.2	All-cause EASRs (3 year rolling averages) males: Scotland, West Central Scotland and Greater Glasgow & Clyde.	Male European age-standardised mortality rates per 100,000 people.	General Register Office for Scotland (GRO (S)), 1982-2005.
Figure 2.3	All-cause EASRs (3 year rolling averages) males: Ruhr area and Germany.	See above.	Germany (ScotPHO Health for All database, 1980-2005). Ruhr area (North Rhine-Westphalia Institute for Health and Work (LIGA), 1990-2005).
Figure 2.4	All-cause EASRs (3 year rolling averages) females: Merseyside & England.	Female European age-standardised mortality rates per 100,000 people.	Office for National Statistics (ONS), 1988-2005.
Figure 2.5	All-cause EASRs (3 year rolling averages) males: Katowice & Poland.	Male European age-standardised mortality rates per 100,000 people.	Poland (ScotPHO Health for All database, 1980-2005). Katowice (Department of Cancer Epidemiology and Prevention, Cancer Centre and Institute of Oncology, Warsaw: 1980-2005).
Table 2.2	Mortality inequalities: comparisons of regional/national rates ratios over time.	Regional all-cause European age-standardised mortality rates per 100,000 people/national all-cause European age-standardised mortality rates per 100,000 people.	New GCPH analysis of data produced for first Aftershock report.

Figure/table	Description	Definition	Sources and notes
Figure 2.6	Male life expectancy at birth, West Central Scotland and ten post-industrial regions.	Male life expectancy at birth using Chiang (II) methodology.	<p>Nord-Pas-de-Calais (CépiDc, Institut National de la Santé et de la Recherche Médicale (INSERM).Data made available for individual years: 1983; 1987; 1991; 1995; 1999; and 2003. Data imputed for years where no data was available).</p> <p>Katowice (Department of Cancer Epidemiology and Prevention, Cancer Centre and Institute of Oncology, Warsaw: 1975-2005).</p> <p>N. Moravia (Institute of Health Information and Statistics of the Czech Republic, 1991-2005).</p> <p>Limburg (CBS Statsline; GGD Nederland, Utrecht, 1996-2005).</p> <p>Merseyside (ONS, 1988-2005).</p> <p>Swansea & S. Wales Coalfields (ONS, 1988-2005).</p> <p>West Central Scotland (GROS, 1982-2005).</p> <p>N. Ireland (NISRA, 1979-2005).</p> <p>Ruhr area (North Rhine-Westphalia Institute for Health and Work (LIGA), 1990-2005).</p> <p>Saxony (Statistical Office of Free State of Saxony, 1983-2005).</p> <p>Saxony-Anhalt (Statistical Office Saxony Anhalt, 1995-2005).</p> <p>Wallonia (Scientific Institute of Public Health, Centre of Operational Research of Public Health, Brussels, 1987-1997).</p>
Figure 2.7	Female life expectancy at birth, West Central Scotland and ten post-industrial regions.	Female life expectancy at birth using Chiang (II) methodology.	See above.

Figure/table	Description	Definition	Sources and notes
Figure 2.8	All-cause mortality: EASRs (3 year rolling averages) 1980-2005, working-age 15-44, males; West Central Scotland in context of maximum, minimum and mean rates for selected European regions.	Male European age-standardised mortality rates per 100,000 people aged 15-44.	See above.
Figure 2.9	All-cause mortality: EASRs (3 year rolling averages) 1980-2005, working-age 45-64, females; West Central Scotland in context of maximum, minimum and mean rates for selected European regions.	Female European age-standardised mortality rates per 100,000 people.	See above.
Figure 2.10	Chronic liver disease & cirrhosis mortality: EASRs (3 year rolling averages) 1980-2005, working-age 15-44, males; West Central Scotland in context of maximum, minimum and mean rates for selected European regions.	Male European age-standardised mortality rates per 100,000 people. Causes of death included in the chronic liver disease & cirrhosis were: 571 (ICD 9) and K70, K73, K74, K76 (ICD 10).	See above.
Figure 2.11	Lung cancer mortality: EASRs (3 year rolling averages) 1980-2005, working-age 45-64, males; West Central Scotland in context of maximum, minimum and mean rates for selected European regions.	Female European age-standardised mortality rates per 100,000 people. Causes of death included in the Lung cancer (malignant neoplasm of trachea/bronchus/lung) category were: 162 (ICD 9) and C33-C34 (ICD 10).	See above.
Figure 3.1	Map of West Central Scotland, defined by eleven local authority areas.	The 11 local authorities are: Glasgow City, North Lanarkshire, South Lanarkshire, West Dunbartonshire, East Dunbartonshire, Renfrewshire, East Renfrewshire, North Ayrshire, South Ayrshire, East Ayrshire and Inverclyde.	Based on data provided through EDINA UKBORDERS with the support of the ESRC and JISC and uses boundary material which is copyright of the Crown.
Figure 3.2	Map of West Central Scotland and the 'proxy' Scottish geographies.	The areas shown are: West Central Scotland, Greater Glasgow health board area, Greater Glasgow & Clyde health board area, Strathclyde region and South Western Scotland.	Based on data provided through EDINA UKBORDERS with the support of the ESRC and JISC and uses boundary material which is copyright of the Crown.

Figure/table	Description	Definition	Sources and notes
Figure 3.3	Male life expectancy, 'best' districts within regions, c. 2005.	Male life expectancy at birth using Chiang (II) methodology.	<p>Ballymoney (N. Ireland): NISRA, average based on 2003-05 data.</p> <p>E. Dunbartonshire (West Central Scotland): GRO(S), average based on 2003-05 data.</p> <p>Dresden (Saxony): Statistical Office of Free State of Saxony (Statistisches Landesamt des Freistaates Sachsen), average based on 2003-05 data.</p> <p>Nivelles (Wallonia): Centre for Operational Research in Public Health-Standardized Procedures for Mortality Analysis (SPMA) CORPH-SPMA, 2005 data.</p> <p>Tourcoing Nord, Sud & Marcq-en-Baroeul (Nord-Pas-de-Calais): National Institute for Statistics and Economic Studies (INSEE) & CepiDc, average based on 2002-06 data.</p> <p>Mülheim an der Ruhr (Ruhr area): Institute for Health and Work, North-Rhine Westphalia (LIGA-NRW), average based on 2003-05 data.</p> <p>Torfaen (Swansea & the S. Wales Coalfields): ONS, average based on 2003-05 data</p> <p>Sefton (Merseyside): ONS, average based on 2003-05 data.</p> <p>Dessau (Saxony-Anhalt): Statistical Office Saxony Anhalt (Landesamt für Verbraucherschutz Sachsen-Anhalt), average based on 2002-04 data.</p> <p>Šumperk (N. Moravia): Czech Statistical Office, average based on 2003-05 data.</p> <p>Bielsko-Biala (Silesia): Central Statistical Office for Poland (GUS), average based on 2006-08 data.</p>
Figure 3.4	Male life expectancy, 'worst' districts within regions, c. 2005.	Male life expectancy at birth using Chiang (II) methodology.	<p>Derry/Londonderry (N. Ireland): NISRA, average based on 2003-05 data.</p> <p>N. Glasgow (West Central Scotland): GRO(S), average based on 2003-05 data.</p> <p>Hoyerswerda (Saxony): Statistical Office of Free State of Saxony (Statistisches Landesamt des Freistaates Sachsen), average based on 2003-05 data.</p> <p>Huy (Wallonia): Centre for Operational Research in Public Health-Standardized Procedures for Mortality Analysis (SPMA) CORPH-SPMA, 2005 data.</p> <p>Vallenciennes O. (Nord-Pas-de-Calais): National Institute for Statistics and Economic Studies (INSEE) & CepiDc, average based on 2002-06 data.</p> <p>Gelsenkirchen (Ruhr area): Institute for Health and Work, North-Rhine Westphalia (LIGA-NRW) , average based on 2003-05 data.</p> <p>Blaenau Gwent (Swansea & the S. Wales Coalfields): ONS, average based on 2003-05 data</p> <p>Liverpool (Merseyside): ONS, average based on 2003-05 data.</p> <p>Bördekreis (Saxony-Anhalt): Statistical Office Saxony Anhalt (Landesamt für Verbraucherschutz Sachsen-Anhalt), average based on 2002-04 data.</p> <p>Karviná (N. Moravia): Czech Statistical Office, average based on 2003-05 data.</p> <p>Chorzów & Siemianowice Śląskie (Silesia): Central Statistical Office for Poland (GUS), average based on 2006-08 data.</p>

Figure 3.5	Female life expectancy, 'best' districts within regions, c. 2005.	Female life expectancy at birth using Chiang (II) methodology.	<p>Ballymoney (N. Ireland): NISRA, average based on 2003-05 data.</p> <p>E. Dunbartonshire (West Central Scotland): GRO(S), average based on 2003-05 data.</p> <p>Dresden (Saxony): Statistical Office of Free State of Saxony (Statistisches Landesamt des Freistaates Sachsen), average based on 2003-05 data.</p> <p>Nivelles (Wallonia): Centre for Operational Research in Public Health-Standardized Procedures for Mortality Analysis (SPMA) CORPH-SPMA, 2005 data.</p> <p>Tourcoing Nord, Sud & Marcq-en-Baroeul (Nord-Pas-de-Calais): National Institute for Statistics and Economic Studies (INSEE) & CapiDc, average based on 2002-06 data.</p> <p>Hamm (Ruhr area): Institute for Health and Work, North-Rhine Westphalia (LIGA-NRW), average based on 2003-05 data.</p> <p>Torfaen (Swansea & the S. Wales Coalfields): ONS, average based on 2003-05 data.</p> <p>Sefton (Merseyside): ONS, average based on 2003-05 data.</p> <p>Dessau (Saxony-Anhalt): Statistical Office Saxony Anhalt (Landesamt für Verbraucherschutz Sachsen-Anhalt), average based on 2002-04 data.</p> <p>Olomouc (N. Moravia): Czech Statistical Office, average based on 2003-05 data.</p> <p>Bielsko-Biala (Silesia): Central Statistical Office for Poland (GUS), average based on 2006-08 data.</p>
Figure 3.6	Female life expectancy, 'worst' districts within regions, c. 2005.	Female life expectancy at birth using Chiang (II) methodology.	<p>Belfast (N. Ireland): NISRA, average based on 2003-05 data.</p> <p>N. Glasgow (West Central Scotland): GRO(S), average based on 2003-05 data.</p> <p>Aue-Schwarzenberg (Saxony): Statistical Office of Free State of Saxony (Statistisches Landesamt des Freistaates Sachsen), average based on 2003-05 data.</p> <p>Charleroi (Wallonia): Centre for Operational Research in Public Health-Standardized Procedures for Mortality Analysis (SPMA) CORPH-SPMA, 2005 data.</p> <p>Roubaix City (Nord-Pas-de-Calais): National Institute for Statistics and Economic Studies (INSEE) & CapiDc, average based on 2002-06 data.</p> <p>Gelsenkirchen (Ruhr area): Institute for Health and Work, North-Rhine Westphalia (LIGA-NRW), average based on 2003-05 data.</p> <p>Blaenau Gwent (Swansea & the S. Wales Coalfields): ONS, average based on 2003-05 data</p> <p>Liverpool (Merseyside): ONS, average based on 2003-05 data.</p> <p>Bördekreis (Saxony-Anhalt): Statistical Office Saxony Anhalt (Landesamt für Verbraucherschutz Sachsen-Anhalt), average based on 2002-04 data.</p> <p>Bruntál (N. Moravia): Czech Statistical Office, average based on 2003-05 data.</p> <p>Chorzów & Siemianowice Śląskie (Silesia): Central Statistical Office for Poland (GUS), average based on 2006-08 data.</p>

Figure/table	Description	Definition	Sources and notes
Figure 3.7	Male EASR, WCS CHPs and Nord-Pas-de-Calais arrondissements/part-arrondissements.	Male European age-standardised mortality rates (EASR) for 15 West Central Scotland Community Health (and Care) Partnerships and 25 arrondissements/part-arrondissements, 2002-06.	Population data: 2006 GRO (S) mid-year estimate (WCS) and 2006 INSEE Census (NPdC), multiplied by 5. Deaths data: 2002-06 GRO (S) (WCS) and Centre d'épidémiologie sur les causes médicales de décès (CepiDc) (NPdC).
Figure 3.8	Female EASR, WCS CHPs and Nord-Pas-de-Calais arrondissements/part-arrondissements.	Female European age-standardised mortality rates (EASR) for 15 West Central Scotland Community Health (and Care) Partnerships and 25 arrondissements/part-arrondissements, 2002-06.	See above.
Figure 3.9	General health.	Percentage of adults aged 15+ rating their general health as good or very good. (For Greater Glasgow & Clyde, adults aged 16+). Proxy geographies used: Greater Glasgow and Clyde (WCS), North-Rhine Westphalia (Ruhr area), Wales (Swansea & the South Wales Valleys).	All regions except Greater Glasgow and Clyde (European Social Survey Rounds 1 – 4 combined). Dates for the European Social Survey were: Round 1 - September 2002 to August 2003; Round 2 - August 2004 to December 2005; Round 3 - August 2006 to May 2007; Round 4 - August 2008 to May 2009. Greater Glasgow and Clyde (Scottish Health Survey 2008).
Figure 3.10	Ruhr area – self-rated health.	Percentage of adults aged 45-74 who rate their general health as good or very good, by gender, Mulheim, Bochum & Essen (2000-03) and Greater Glasgow (2003).	Heinz Nixdorf Recall Study (Mulheim, Bochum & Essen) and Scottish Health Survey 2003 (Greater Glasgow).
Figure 3.11	Long-term limiting illness or disability.	Percentage of adults aged 15+ reporting they had a long-term illness or disability that limited their daily activities. (For Greater Glasgow & Clyde, adults aged 16+). Proxy geographies used: Greater Glasgow and Clyde (WCS), North-Rhine Westphalia (Ruhr area), Wales (Swansea & the South Wales Valleys).	All regions except Greater Glasgow and Clyde (European Social Survey Rounds 1 – 4 combined). Greater Glasgow and Clyde (Scottish Health Survey 2008).
Figure 3.12	Life satisfaction.	Mean score for satisfaction with life as a whole, adults aged 15+. Scale used: (0 (extremely dissatisfied) -10 (extremely satisfied)). (For Greater Glasgow & Clyde, adults aged 16+). Proxy geographies used: Greater Glasgow and Clyde (WCS), Wales (Swansea & the South Wales Valleys).	Greater Glasgow and Clyde (Scottish Health Survey 2008). Ruhr area (German Socio-Economic Panel 2008). All other regions (European Social Survey Rounds 1 – 4 combined).

Figure/table	Description	Definition	Sources and notes
Figure 3.13	Nord-Pas-de-Calais – life satisfaction.	Percentage of men and women aged 15+ who were very or fairly satisfied with their life as a whole nowadays. Proxy geographies used: South Western Scotland (West Central Scotland).	Mannheim Eurobarometer Trend File 1970-2000, based on pooled data for 1990-2000.
Figure 3.14	Mean systolic blood pressure, male MONICA participants aged 35-64, 1992-96.	Mean systolic blood pressure (mm Hg) among study population.	Published as: Kuulasmaa K, Tunstall-Pedoe H, Dobson A, Fortmann S, Sans S, Tolonen H, Evans A, Ferrario M, Tuomilehto J. Lancet. 2000 Feb 26;355(9205):675-87. Estimation of contribution of changes in classic risk factors to trends in coronary-event rates across the WHO MONICA Project populations. City data and years were: Lille, 1995-96, Charleroi, 1990-93, Chemnitz/Zwickau, 1993-94, Belfast, 1991-92 and Glasgow, 1995.
Figure 3.15	Mean total cholesterol, male MONICA participants aged 35-64, 1992-96.	Total cholesterol (mmol/L: millimoles (mmol) per liter/litre (L) of blood) among study population.	See above.
Figure 3.16	Ruhr area – high blood pressure.	Percentage of adults aged 45-74 reporting that they have been diagnosed by a doctor (or equivalent) with high blood pressure, by gender, Mulheim, Bochum & Essen (2000-03) and Greater Glasgow (2003).	Heinz Nixdorf Recall Study (Mulheim, Bochum & Essen) 2000-2003 and Scottish Health Survey 2003 (Greater Glasgow).
Figure 3.17	Ruhr area – diabetes.	Percentage of adults aged 45-74 reporting that they have been diagnosed by a doctor (or equivalent) with diabetes, by gender, Mulheim, Bochum & Essen (2000-03) and Greater Glasgow (2003).	Heinz Nixdorf Recall Study (Mulheim, Bochum & Essen) 2000-2003 and Scottish Health Survey 2003 (Greater Glasgow).
Figure 3.18	Unemployed as percentage of economically active adults: 2008.	ILO unemployed as a percentage of economically active population aged 15+ (16+ for UK areas).	West Central Scotland, Merseyside and Swansea & S. Wales Coalfields (Annual Population Survey). German regions (Statistische Ämter des Bundes und der Länder) N. Moravia (Czech Statistical Office). All other regions (Eurostat).

Figure/table	Description	Definition	Sources and notes
Figure 3.19	Unemployed as percentage of economically active adults, South Western Scotland and West European post-industrial regions, 1983-2008.	ILO unemployed as a percentage of economically active population aged 15+. West European areas were: S.W. Scotland, Merseyside, N. Ireland, West Wales and the Valleys, Wallonia, Limburg, Nord-Pas-de-Calais, Ruhr area. Proxy geographies used: South Western Scotland (West Central Scotland), West Wales and the Valleys (Swansea and the South Wales Coalfields).	Ruhr area (Esch, K, Langer, D. Bildungsbe(nach)teiligung im Ruhrgebiet: eine Innovationslokomotive im Tal der Tränen? In: Institut Arbeit und Technik: Jahrbuch 2002/2003. Gelsenkirchen, S. 77-93: http://www.iaq.uni-due.de/aktuell/veroeff/jahrbuch/jahrb0203/07-esch-langer.pdf ; Arbeitsmarktstatistik der Bundesagentur für Arbeit) All other regions (Overman HG, Puga D. Unemployment clusters across Europe's regions and countries, published in Economic Policy 34, April 2002: 115-147; Eurostat).
Figure 3.20	Unemployed as percentage of economically active adults, South Western Scotland and East European post-industrial regions, 1986-2008.	East European areas were: Silesia (Slaskie), Saxony, Saxony-Anhalt and Northern Moravia. Proxy geographies used: South Western Scotland (West Central Scotland).	South Western Scotland (Overman & Puga; Eurostat). N. Moravia (Czech Statistical Office). Silesia (Central Statistical Office of Poland). Saxony (Eurostat). Saxony-Anhalt (Eurostat).
Figure 3.21	Unemployment rate of 11 West Central Scotland local authorities and 15 Ruhr area kreise, 2007.	Unemployed as percentage of economically active, 16+ both regions.	West Central Scotland (Annual Population Survey). Ruhr area (Federal Statistical Office of Germany). Note that kreis Unna, Wesel and Recklinghausen cover both the towns of the same name and the rural surrounds.
Figure 3.22	Unemployment rate of 11 West Central Scotland local authorities and 15 Ruhr area kreise, 1991-93	Unemployed as percentage of economically active, 16+ both regions.	West Central Scotland (GRO (S) Census of Population 1991). Ruhr area (German Youth Institute, September 1993 data). http://www.dji.de/cgi-bin/projekte/output.php?projekt=99 .
Figure 3.23	Unemployment rate of 15 West Central Scotland Community Health (and Care) Partnerships and 29 powiats/merged powiats, 2001-02.	Unemployed as percentage of economically active, 16-74 year olds (WCS) and 15-64 year olds (Silesia).	West Central Scotland (GROS Census of Population 2001) Silesia (Central Statistical Office of Poland (GUS) Census of Population and Housing 2002).

Figure/table	Description	Definition	Sources and notes
Figure 3.24	Crude employment rates for men aged 15-64, WCS compared to average for West European regions.	<p>Proxy geographies used: Central Clydeside Conurbation/Strathclyde (West Central Scotland) for 1987-1991 rates.</p> <p>For 1980s, employment rates for Merseyside and West Central Scotland proxy (Central Clydeside conurbation) were directly calculated from Labour Force Survey data.</p> <p>For other regions, and for Merseyside & WCS from 1991 onwards, this was calculated as: (Number of men (women) in employment in region/Number of men (women) aged 15-64 resident in region)*100</p> <p>Note that this crude measure assumes zero commuting. However, the crude estimates for the 1990s are very close to Eurostat published figures for employment rates among this aged group.</p>	<p>Wallonia (Census of Population 1981; Eurostat).</p> <p>Limburg (Eurostat).</p> <p>Nord-Pas-de-Calais (Recensement de la Population 1982; Eurostat).</p> <p>N. Moravia (CSSR Yearbooks and Czech Labour Force Survey).</p> <p>Ruhr area (North-Rhine Westphalia Institute for Work and Health (LIGA); Regionalverband Ruhr).</p> <p>West Central Scotland Merseyside, Swansea and the South Wales Coalfields (Census of Population 1981; ONS; Labour Force Survey; Annual Population Survey).</p> <p>N. Ireland (Eurostat; NISRA; Labour Force Survey).</p>
Figure 3.25	Crude employment rates for men aged 15-64, WCS compared to average for East European regions.	See above.	<p>As above for WCS plus:</p> <p>Saxony (Statistical Yearbook of the GDR; Eurostat).</p> <p>Saxony-Anhalt (Statistical Yearbook of the GDR; Eurostat).</p> <p>Katowice/Silesia (Statistical Yearbook of the Regions – Poland and Polish Labour Force Survey).</p>
Figure 3.26	Crude employment rates for women aged 15-64, WCS compared to average for West European regions.	<p>For 1980s, employment rates for Merseyside and West Central Scotland proxy (Central Clydeside conurbation) were directly calculated from Labour Force Survey data.</p> <p>For other regions, and for Merseyside & WCS from 1991 onwards, this was calculated as: (Number of men (women) in employment in region/Number of men (women) aged 15-64 resident in region)*100</p> <p>Note that this crude measure assumes zero commuting. However, the crude estimates for the 1990s are very close to Eurostat published figures for employment rates among this aged group.</p>	<p>Wallonia (Census of Population 1981; Eurostat).</p> <p>Limburg (Eurostat).</p> <p>Nord-Pas-de-Calais (Recensement de la Population 1982; Eurostat).</p> <p>N. Moravia (CSSR Yearbooks and Czech Labour Force Survey).</p> <p>Ruhr area (North-Rhine Westphalia Institute for Work and Health (LIGA); Regionalverband Ruhr).</p> <p>West Central Scotland , Merseyside, Swansea and the South Wales Coalfields (Census of Population 1981; ONS; Labour Force Survey; Annual Population Survey).</p> <p>N. Ireland (Eurostat; NISRA; Labour Force Survey).</p>

Figure/table	Description	Definition	Sources and notes
Figure 3.27	Crude employment rates for women aged 15-64, WCS compared to average for East European regions.	See above.	As above for WCS plus: Saxony (Statistical Yearbook of the GDR; Eurostat). Saxony-Anhalt (Statistical Yearbook of the GDR; Eurostat). Katowice/Silesia (Statistical Yearbook of the Regions – Poland and Polish Labour Force Survey).
Figure 3.28	Percentage of men aged 25-49 not in employment: 2001.	Calculated as: (Total men aged 25-49 resident in region - Total men aged 25-49 in employment)/Total men aged 25-49 resident in region.	All regions except Silesia: Eurostat Regional Statistics, Census: Regional level census 2001 round. Total residents figure from population structure folder, residents in employment figure from active population folder. Silesia data from the Central Statistical Office of Poland (GUS).
Figure 3.29	Percentage of households with no car and percentage reporting that they cannot afford a car, selected European countries: 2007.	Percentage of adult respondents reporting there is no car in their household & percentage reporting they cannot afford a car.	Reporting no car: Flash Eurobarometer No 206b, 2007. Reporting they cannot afford one: EU-SILC, 2007 (via Eurostat).
Figure 3.30	Percentage of private households without access to a car, c. 1999-2003.	Number of households with no access to a car/van as a percentage of all households.	Saxony (Mobility in Germany 2002). Ruhr area (German Socio-Economic Panel 2001 & 2003 combined data). Nord-Pas-de-Calais (Recensement de la Population 1999). Saxony-Anhalt (Mobility in Germany 2002). Wallonia (Enquête Socio-économique 2001). N. Ireland (NISRA Census of Population 2001). Swansea and the South Wales Coalfields (ONS Census of Population 2001). Merseyside (ONS Census of Population 2001). West Central Scotland (GROS Census of Population 2001). N. Moravia (Czech Statistical Office – Population and Housing Census 2001). Silesia (Household Budget Survey 2003). Data not available for Limburg.
Figure 3.31	Percentage of private households without access to a car, c. 1999-2001, WCS CHPs and NPdC arrondissements/part-arrondissements.	Number of households with no access to a car/van as a percentage of all households.	Nord-Pas-de-Calais (Recensement de la Population 1999). West Central Scotland (GROS Census of Population 2001).
Figure 3.32	Percentage of private households without access to a car, c. 1999-2001, WCS local authorities and N. Moravian districts.	Number of households with no access to a car/van as a percentage of all households.	N. Moravia (Czech Statistical Office – Population and Housing Census 2001). West Central Scotland (GROS Census of Population 2001).

Figure/table	Description	Definition	Sources and notes
Figure 3.33	Percentage of households not owning their own home.	Number of private households renting from a private landlord, social landlord or other landlord as a percentage of all private households.	Silesia (Central Statistical Office of Poland (GUS) Census of Population and Housing 2002). Nord-Pas-de-Calais (Recensement de la Population 1999). N. Ireland (NISRA Census of Population 2001). Swansea and South Wales Coalfields (ONS Census of Population 2001). N. Moravia (CSO Population and Housing Census 2001). Limburg (CBS Dutch Virtual Census 2001). Merseyside (ONS Census of Population 2001). Wallonia (Enquête Socio-économique 2001, reported in Decker and Vandebussche (2007). Saxony-Anhalt (German Microcensus 2001 – accessed via www.gbe-bund.de). West Central Scotland (GROS Census of Population 2001). Saxony (German Microcensus 2001 – accessed via www.gbe-bund.de). Ruhr area (Urban Audit 2001).
Figure 3.34	Perceived adequacy of household income.	Percentage of adults aged 15+ reporting it difficult/very difficult to manage on household income nowadays. (For West Central Scotland, adults aged 18+; other, d/k and not answered excluded from base). Proxy geographies used: North-Rhine Westphalia (Ruhr area), Wales (Swansea & the South Wales Valleys).	West Central Scotland (Scottish Social Attitudes Survey 2007). All other regions (European Social Survey Rounds 1 – 4 combined).
Figure 3.35	Percentage of children aged 11-15 living in low affluence households according to the Family Affluence Scale (FAS).	Percentage of children aged 11-15 living in low affluence households according to the Family Affluence Scale (FAS). The FAS score (from 0-7) is calculated from responses to four questions (family ownership of a car; ownership of computers; whether the young person has their own bedroom; and number of family holidays in the year prior to the survey). Scores of 0-3 indicate low affluence, 4-5 middle affluence and 6-7 high affluence. Proxy geographies used: North-Rhine Westphalia (Ruhr area), French-speaking Belgium (Wallonia).	Saxony (University of Bielefeld analysis of German Health Behaviours in School-aged Children Study, 2006). North-Rhine Westphalia (University of Bielefeld analysis of German Health Behaviours in School-aged Children Study, 2006). Wallonia (Ecole de Santé Publique de l'ULB (Brussels) in Belgium analysis of Belgian regional HBSC data, 2006). West Central Scotland (University of Edinburgh analysis of Scottish Health Behaviours in School-aged Children Study, 2006). Note: Data for Wallonia derived from 'French-speaking Belgium' sample, including Brussels. This is likely to increase the percentage of children living in low affluence households and decrease the percentage living in high affluence households reported for Wallonia here.

Figure/table	Description	Definition	Sources and notes
Figure 3.36	Percentage of children aged 11-15 living in high affluence households according to the Family Affluence Scale (FAS). See above for more details.	Percentage of children aged 11-15 living in high affluence households according to the Family Affluence Scale (FAS). See above for more details.	See above.
Figure 3.37	Percentage of resident population who were 'income deprived', selected UK regions: 2005.	Calculated as: (Number of adults in receipt of Guaranteed Pension Credit, Income Support or Job Seeker's Allowance and number of children living in households where parent is in receipt of Income Support or JSA)/Resident mid-year population of region*100.	Department for Work and Pensions for benefits data; NISRA, ONS and GRO (S) for mid-year population data.
Figure 3.38	Income inequality in Scotland and West European countries: 2004.	Gini Coefficient (from 0-1), with 0 indicating maximum equality of income distribution and 1 maximum inequality. LIS method uses the 'square root scale' method: household disposable income was divided by the square root of the number of people in each household and this new set of income figures was then used to produce Gini Coefficient estimates.	Luxemburg Income Study for all countries: 2004 data except France and Sweden (2005) and Belgium (2000).
Figure 3.39	Income inequality in Scotland and selected European countries: 2004	See above.	See above.
Figure 3.40	Income inequality in Scotland and selected European countries: mid-1980s and mid-2000s.	See above.	Netherlands (Luxemburg Income Study, 1987, 1991, 1994, 1999, 2004). England, Wales, Scotland, N. Ireland (Luxemburg Income Study, 1986, 1991, 1995, 1999, 2004). France (Luxemburg Income Study, 1984, 1989, 1994, 2000, 2005). Poland (Luxemburg Income Study, 1986, 1992, 1995, 1999, 2004). Germany (Luxemburg Income Study, 1984, 1989, 1994, 2000, 2004). Belgium (Luxemburg Income Study, 1985, 1992, 1995, 2000). Czech Republic (Luxemburg Income Study, 1992, 1996, 2004).

Figure/table	Description	Definition	Sources and notes
Figure 3.41	Income inequality in West Central Scotland and selected post-industrial regions, c. mid-2000s.	See above. Note that the household income from the Scottish Household Survey only records income for the household head and his/her partner: this will understate incomes in households with a third adult. Proxy geographies used: North-Rhine Westphalia (Ruhr area), Wales (Swansea & S. Wales Valleys).	Saxony-Anhalt (Luxemburg Income Study, 2004). Saxony (Luxemburg Income Study, 2004). Silesia (Luxemburg Income Study, 2004). Nord-Pas-de-Calais (Luxemburg Income Study, 2005). Wallonia (Luxemburg Income Study, 2000). N. Moravia (Moravskoslezsky region: Luxemburg Income Study, 2004). North-Rhine Westphalia (Luxemburg Income Study, 2004). Merseyside (Family Resources Survey, 2003-07 pooled data). West Central Scotland (Scottish Household Survey, 2003-04). Wales (Luxemburg Income Study, 2004). N. Ireland (Luxemburg Income Study, 2004).
Figure 3.42	Income inequality in West Central Scotland and selected post-industrial regions, mid-1980s to mid-2000s.	See above. Proxy geographies used: North-Rhine Westphalia (Ruhr area), Wales (Swansea & S. Wales Valleys), North-West England (Merseyside).	North West England, Wales and N. Ireland (1986, 1991, 1995, 1999, 2004, Luxemburg Income Study). Nord-Pas-de-Calais (1984, 1989, 1994, 2000 and 2005, Luxemburg Income Study). N. Moravia (1996 and 2004, Luxemburg Income Study). North-Rhine Westphalia (1984, 1989, 1994, 2000, 2004). Saxony and Saxony-Anhalt (1994, 2000, 2004). Wallonia (Luxemburg Income Study, 1985, 1992, 1995, 2000). Silesia (Luxemburg Income Study, 1986, 1992, 1995, 1999, 2004). West Central Scotland (Scottish Household Survey, 1999-00 and 2003-04).
Figure 3.43	Percentage of population living in relative poverty: 1994-2001.	Estimated percentage of people in each region with an equivalised disposable income below 60% of the national median equivalised disposable income. Proxy geographies used: Moravskoslezsko (N. Moravia), North-Rhine Westphalia (the Ruhr area), South Western Scotland (WCS)., Wales (Swansea and the S. Wales Valleys).	Lemmi et al. <i>Regional Indicators to reflect social exclusion and poverty VT/2003/43. Final Report</i> . Brussels: European Commission; 2003. Northern Ireland n/a. Moravskoslezsko: as Table A5. GCPH calculations used estimates from Appendix Tables A1-A6: Merseyside, SW Scotland, Limburg (National * NUTS 1 ratio* NUTS II ratio). Nord-Pas-de-Calais, Wallonia, Wales (National * NUTS 1 ratio). Saxony and Saxony-Anhalt (E. German * NUTS 1 ratio). North-Rhine Westphalia (W. German * NUTS 1 ratio)

Figure/table	Description	Definition	Sources and notes
Figure 3.44	Index of dissimilarity, selected British regions, 1970-2001.	<p>The formula for calculating the Index is:</p> $\text{Dissimilarity Index} = \frac{1}{2} \left \frac{group_i}{group_{total}} - \frac{non-group_i}{non-group_{total}} \right $ <p>where $group_i$ denotes the number of people/households with a certain characteristic living in neighbourhood i, $group_{total}$ the number living in the entire region, and $non-group_i$ and $non-group_{total}$ are similarly defined for people/households without that characteristic. It also includes the 'core poor' (defined as those breadline poor who were also materially deprived (could not afford certain material assets, holidays or were in rent/mortgage arrears) and considered their household to be poor 'sometimes' or 'all the time').</p>	<p>Based on original data published as part of the <i>Poverty, wealth and place in Britain, 1968 to 2005</i>: http://sasi.group.shef.ac.uk/research/transformation/utpp_downloads.html.</p>
Figure 3.45	Gender ratio, younger working-age adults.	Calculated as: Men aged 15-44/women aged 15-44*100.	<p>N. Ireland: NISRA. West Central Scotland: GRO(S). Saxony: Statistical Office of Free State of Saxony (Statistisches Landesamt des Freistaates Sachsen). Wallonia: Centre for Operational Research in Public Health-Standardized Procedures for Mortality Analysis (SPMA) CORPH-SPMA. Nord-Pas-de-Calais: National Institute for Statistics and Economic Studies (INSEE). Ruhr area: Institute for Health and Work, North-Rhine Westphalia (LIGA-NRW). Swansea & the S. Wales Coalfields: ONS. Merseyside: ONS. Saxony-Anhalt: Statistical Office of Saxony Anhalt (Landesamt für Verbraucherschutz Sachsen-Anhalt). Limburg: CBS Dutch Virtual Census 2001. N. Moravia): Czech Statistical Office. Katowice: Department of Cancer Epidemiology & Prevention, Cancer Centre & Institute of Oncology, Warsaw.</p>

Figure/table	Description	Definition	Sources and notes
Figure 3.46	Gender ratio, older working-age adults.	Calculated as: Men aged 45-64/women aged 45-64*100.	N. Ireland: NISRA. West Central Scotland: GRO(S). Saxony: Statistical Office of Free State of Saxony (Statistisches Landesamt des Freistaates Sachsen). Wallonia: Centre for Operational Research in Public Health-Standardized Procedures for Mortality Analysis (SPMA) CORPH-SPMA. Nord-Pas-de-Calais: National Institute for Statistics and Economic Studies (INSEE). Ruhr area: Institute for Health and Work, North-Rhine Westphalia (LIGA-NRW). Swansea & the S. Wales Coalfields: ONS. Merseyside: ONS. Saxony-Anhalt: Statistical Office of Saxony Anhalt (Landesamt für Verbraucherschutz Sachsen-Anhalt). Limburg: CBS Dutch Virtual Census 2001. N. Moravia: Czech Statistical Office. Katowice: Department of Cancer Epidemiology & Prevention, Cancer Centre & Institute of Oncology, Warsaw.
Figure 3.47	Dependency ratio: 2005.	Calculated as: ((Residents aged 65 and over + Residents under the age of 15) / Residents aged 15-64) * 100.	N. Ireland: NISRA. West Central Scotland: GRO(S). Saxony: Statistical Office of Free State of Saxony (Statistisches Landesamt des Freistaates Sachsen). Wallonia: Centre for Operational Research in Public Health-Standardized Procedures for Mortality Analysis (SPMA) CORPH-SPMA. Nord-Pas-de-Calais: National Institute for Statistics and Economic Studies (INSEE). Ruhr area: Institute for Health and Work, North-Rhine Westphalia (LIGA-NRW). Swansea & the S. Wales Coalfields: ONS. Merseyside: ONS. Saxony-Anhalt: Statistical Office of Saxony Anhalt (Landesamt für Verbraucherschutz Sachsen-Anhalt). Limburg: CBS Dutch Virtual Census 2001. N. Moravia: Czech Statistical Office. Katowice: Department of Cancer Epidemiology & Prevention, Cancer Centre & Institute of Oncology, Warsaw.

Figure/table	Description	Definition	Sources and notes
Figure 3.48	Dependency ratio, selected European post-industrial regions, 1982-2005.	Calculated as: ((Residents aged 65 and over + Residents under the age of 15) / Residents aged 15-64) * 100.	N. Ireland: NISRA. West Central Scotland: GRO(S). Saxony: Statistical Office of Free State of Saxony (Statistisches Landesamt des Freistaates Sachsen). Wallonia: Centre for Operational Research in Public Health-Standardized Procedures for Mortality Analysis (SPMA) CORPH-SPMA. Nord-Pas-de-Calais: National Institute for Statistics and Economic Studies (INSEE). Ruhr area: Institute for Health and Work, North-Rhine Westphalia (LIGA-NRW). Swansea & the S. Wales Coalfields: ONS. Merseyside: ONS. Saxony-Anhalt: Statistical Office of Saxony Anhalt (Landesamt für Verbraucherschutz Sachsen-Anhalt). Limburg: CBS Dutch Virtual Census 2001. N. Moravia): Czech Statistical Office. Katowice: Department of Cancer Epidemiology & Prevention, Cancer Centre & Institute of Oncology, Warsaw.
Figure 3.49	Population density.	Calculated as: (Total residents / Total area of region (in km ²)). All data 2007 except Ruhr area (2008).	Ruhr area (Regionalverband Ruhr (RVR)). Swansea & the South Wales Coalfields (ONS). Northern Ireland (NISRA). West Central Scotland (GROS). All other regions (Eurostat).
	Population change as a marker of growth and decline.	The relevant categories used were: Continuous decline: decline in 70s, 80s, 90s and 2000s Long-term decline: growth in 70s, decline in 80s, 90s and 2000s Medium-term decline: growth in 70s and 80s, decline in 90s and 2000s Recent resurgence: decline in 80s and 90s, growth in 2000s Long-term resurgence: decline in 70s, growth in 80s, 90s and 2000s Continuous growth: growth in 70s, 80s, 90s and 2000s	Mykhnenko, V. and Turok, I. (2007) European Regions and Cities Dataset 1960 - 2005: Methods and Sources, Working Paper 3 (Glasgow, University of Glasgow CPPR).

Figure/table	Description	Definition	Sources and notes
Figure 3.50	Fertility rate.	Live births per 1000 women aged 15-44.	All regions Eurostat (2003) except: Silesia: Population data (Central Statistical Office for Poland (GUS) 2004); Births data (Eurostat, 2004). Limburg: Population data (CBS Dutch Virtual Census 2001); Births (Eurostat, 2001).
Figure 3.51	Fertility rate, 2008, by WCS local authority and Ruhr area kreise.	Live births per 1000 women aged 15-44.	West Central Scotland: GRO(S) births and mid-year population estimates, 2008. Ruhr area: German Federal Statistics Office, 2008.
Figure 3.52	Percentage of adults aged 25-64 with ISCED tertiary level qualifications.	Percentage of adults aged 25-64 with tertiary level qualifications. (Level 5-6: Degree/NVQ level 4/5 level qualifications and above). Proxy geographies used: South Western Scotland (WCS), North-Rhine Westphalia (Ruhr area), West Wales & the Valleys (Swansea & S. Wales Valleys).	Eurostat 2008.
Figure 3.53	Percentage of adults aged 25-64 with < ISCED Level 3 qualifications.	Percentage of adults aged 25-64 with qualifications at levels 0-2 (Level 0-2: No qualifications to NVQ Level 1).	See above.
Figure 3.54	Percentage of adults with tertiary level qualifications, West Central Scotland local authorities and N. Moravian districts.	Adults aged 15+ (N. Moravia) and 16-64 (WCS). Tertiary level qualifications defined as: <ul style="list-style-type: none"> higher professional schools, bachelor programmes, university education, doctoral programmes for N. Moravia; NVQ Level 4+ for WCS. 	N. Moravia (Czech Statistical Office – Population and Housing Census 2001) West Central Scotland (Annual Population Survey January-December 2004.) Use of the different age definitions is likely to inflate the figures for the Scottish areas. Comparative analysis of Annual Population Survey data at the Scotland level for this indicator showed a difference of around five percentage points between the % of 16-64 year-olds with tertiary qualifications (28.5%) and the % of the population aged 16+ (23.3%).
Figure 3.55	Percentage of adults with no qualifications, West Central Scotland local authorities and N. Moravian districts.	Adults aged 15+ (N. Moravia) and 16-74 (WCS). No qualifications defined as without education, uncompleted basic education or basic education (N. Moravia) and no qualifications or qualifications outwith this group (WCS).	N. Moravia (Czech Statistical Office – Population and Housing Census 2001). West Central Scotland (GROS Census of Population 2001). Use of different age groups may slightly inflate the figures for the Northern Moravian compared to WCS areas.

Figure/table	Description	Definition	Sources and notes
Figure 3.56	Percentage of households with children headed by a lone parent.	<p>Lone parent households as a percentage of all households with children, regardless of age/dependent status of children, except for Nord-pas-de-Calais, Northern Moravia and Ruhr area.</p> <p>For Nord-Pas-de-Calais and Northern Moravia, figure shown is lone parent households with dependent children (< 25 years of age) as a percentage of all households with dependent children (< 25 years of age).</p> <p>For Ruhr, Urban Audit figure for 2001 (which excludes households with children aged 18+) was adjusted using published data on North-Rhine Westphalia on percentage of lone parent families as percentage of all families (19.9%) and lone parent families with children < 18 as percentage of all families with dependent children < 18 (16.6%) in 2006.</p>	<p>Silesia (Central Statistical Office of Poland (GUS) Census of Population and Housing 2002).</p> <p>Nord-Pas-de-Calais (Recensement de la Population 1999).</p> <p>N. Ireland (NISRA Census of Population 2001).</p> <p>Swansea and South Wales Coalfields (ONS Census of Population 2001).</p> <p>N. Moravia (CSO Population and Housing Census 2001).</p> <p>Limburg (CBS Dutch Virtual Census 2001).</p> <p>Merseyside (ONS Census of Population 2001).</p> <p>Wallonia (Enquête Socio-économique 2001).</p> <p>Saxony-Anhalt (German Microcensus 2001 – accessed via www.gbe-bund.de).</p> <p>West Central Scotland (GROS Census of Population 2001).</p> <p>Saxony (German Microcensus 2001 – accessed via www.gbe-bund.de).</p> <p>Ruhr area (Urban Audit 2001).</p>
Figure 3.57	Percentage of households with dependent children headed by a lone parent 1990-91 to 1999-01, selected European regions.	<p>Lone parent households with dependent children as a percentage of all households with dependent children. Note this uses the dependent children definition to allow time series comparisons. Dependent children are defined as:</p> <p>Age 0-25 and economically inactive (N. Moravia); Unmarried children living with their parents and under 25 years old (Nord-Pas-de-Calais); Aged 0-15 or aged 16-18 if in full-time education (Merseyside and WCS). Aged 0-18 and living with their parents (Ruhr area).</p>	<p>N. Moravia (CSO Population and Housing Census 1991 and 2001).</p> <p>Nord-Pas-de-Calais (INSEE Recensement de la Population 1990 and 1999).</p> <p>Ruhr area (Urban Audit, 1991 and 2001).</p> <p>Merseyside (ONS Census of Population 1991 and 2001).</p> <p>West Central Scotland (GROS Census of Population 1991 and 2001).</p>
Figure 3.58	Percentage of households with dependent children headed by a lone parent, by WCS CHPs and Nord-Pas-de-Calais arrondissements/part-arrondissements, 1999-01.	See above for definitions used.	<p>Nord-Pas-de-Calais (Recensement de la Population 1999).</p> <p>West Central Scotland (GROS Census of Population 2001).</p>

Figure/table	Description	Definition	Sources and notes
Figure 3.59	Percentage of households with dependent children headed by a lone parent, by WCS CHPs and Silesian powiats/merged powiats, 2001-02.	See above for WCS definition used. For Silesia, definition is: <ul style="list-style-type: none"> • Dependant children aged 0-24 years in the family household /institutional household. 	Silesia (Central Statistical Office of Poland (GUS) Census of Population and Housing 2002 West Central Scotland (GROS Census of Population 2001).
Figure 3.60	Percentage of single person households, 1999-2002.	Single person households as a percentage of all households.	Silesia (Central Statistical Office of Poland (GUS) Census of Population and Housing 2002). Nord-Pas-de-Calais (Recensement de la Population 1999). N. Ireland (NISRA Census of Population 2001). Swansea and South Wales Coalfields (ONS Census of Population 2001). N. Moravia (CSO Population and Housing Census 2001). Limburg (CBS Dutch Virtual Census 2001). Merseyside (ONS Census of Population 2001). Wallonia (Enquête Socio-économique 2001). Saxony-Anhalt (German Microcensus 2001 – accessed via www.gbe-bund.de). West Central Scotland (GROS Census of Population 2001) Saxony (German Microcensus 2001 – accessed via www.gbe-bund.de). Ruhr area (Urban Audit 2001).
Figure 3.61	Percentage of single person households 1990-91 to 1999-01, selected European regions.	See above.	N. Moravia (CSO Population and Housing Census 1991 and 2001). Nord-Pas-de-Calais (INSEE Recensement de la Population 1990 and 1999). Ruhr area (Urban Audit, 1991 and 2001). Merseyside (ONS Census of Population 1991 and 2001). West Central Scotland (GROS Census of Population 1991 and 2001).

Figure/table	Description	Definition	Sources and notes
Figure 3.62	Percentage of single person households, West Central Scotland local authorities and Ruhr area kreise: 2007-08.	Single person households as a percentage of all households.	West Central Scotland (Scottish Household Survey 2007-08). Ruhr area (IT.NRW). Note that kreis Unna, Wesel and Recklinghausen cover both the towns of the same name and the rural surrounds.
Figure 3.63	Percentage of single person households, West Central Scotland local authorities and N. Moravian districts: 2001.	See above.	N. Moravia (Czech Statistical Office – Population and Housing Census 2001). West Central Scotland (GROS Census of Population 2001).
Figure 3.64	Percentage of adults aged 25-64 who were married: c. 2001.	Calculated as: (Adults aged 25-64 married or separated/Total adults aged 25-64)*100.	Eurostat. Note that the GROS/ONS published data excludes those legally separated from marriage data. Data from Wallonia not available.
Figure 3.65	Marital status of adults aged 45-69 who were married: c. 2001, Karvina/Havirov and Glasgow City.	Four categories shown: single; married; separated or divorced; widowed.	Glasgow City (GROS Census of Population 2001). Karvina/Havirov (HAPIEE Study 2002-05).
Figure 3.66	Percentage of adults aged 25-64 who were married, Ruhr area kreise and WCS NUTS 3 areas: c. 2001.	Calculated as: (Adults aged 25-64 married or separated/Total adults aged 25-64)*100.	Eurostat. West Central Scotland NUTS 3 areas include: East Dunbartonshire, West Dunbartonshire and Helensburgh & Lomond; East Ayrshire and North Ayrshire mainland; Glasgow City, Inverclyde, East Renfrewshire and Renfrewshire; North Lanarkshire; South Ayrshire; South Lanarkshire. Note that kreis Unna, Wesel and Recklinghausen cover both the towns of the same name and the rural surrounds.
Figure 3.67	Social capital: religious participation.	Percentage of adults aged 15+ who never attend religious ceremonies apart from special occasions. (For West Central Scotland, percentage of adults aged 18+ who never or practically never attend church apart from special occasions, varies too much to say, refused or not answered excluded from base). Proxy geographies used: North-Rhine Westphalia (Ruhr area), North-West England (Merseyside).	West Central Scotland (Scottish Social Attitudes Survey 2007). Swansea and the South Wales Coalfields (Wales Life and Times Survey 2003). Northern Ireland (Continuous Household Survey) *. All other regions (European Social Survey Rounds 1 – 4 combined). *Excluding those unable to attend.

Figure/table	Description	Definition	Sources and notes
Figure 3.68	Social capital: trust.	Mean score for ‘most people can be trusted’ for adults aged 15+. Scale used: 0 (you can’t be too careful) -10 (most people can be trusted). Proxy geographies used: Scotland (WCS), North-Rhine Westphalia (Ruhr area), North-West England (Merseyside), Wales (Swansea & S. Wales Valleys).	European Social Survey Rounds 1 – 4 combined.
Figure 3.69	Social capital: political participation.	Percentage of adults aged 15+ not at all interested in politics. (For West Central Scotland, adults aged 18+ who rate their interest in politics as ‘none at all’). Proxy geographies used: North-Rhine Westphalia (Ruhr area), North-West England (Merseyside), Wales (Swansea & S. Wales Valleys).	West Central Scotland (Scottish Social Attitudes Survey 2007) All other regions (European Social Survey Rounds 1 – 4 combined).
Figure 3.70	Social capital: political participation.	Voter turnout at national parliamentary elections, c. 2005-07. A full list of West Central Scotland constituencies used to calculate results is available on request. Proxy geographies used: North-Rhine Westphalia (Ruhr area)	North-Rhine-Westphalia (Federal Returning Officer, 2005). Limburg (Dutch Electoral Council, 2006). Saxony (Federal Returning Officer, 2005). Saxony-Anhalt (Federal Returning Officer, 2005). N. Ireland (UK Electoral Commission, 2005). N. Moravia (Czech Statistical Office, 2006). Swansea & the S. Wales Coalfields (UK Electoral Commission, 2005). Nord-Pas-de-Calais (French Ministry of the Interior, 2007). West Central Scotland (UK Electoral Commission, 2005). Slaskie (National Electoral Commission, 2007). Merseyside (UK Electoral Commission, 2005). Wallonia data excluded from analysis because voting compulsory in Belgium. UK data from the UK Electoral Commission, compiled (for 1987-2001) by David Boothroyd on the ‘United Kingdom Election Results’ website (www.election.demon.co.uk), and (for 2005) by the ‘UK Political Info’ website (www.ukpolitical.info)
Figure 3.71	Social capital: political participation.	Voter turnout at national parliamentary elections, selected European regions: 1990-93 to 2005-07. A full list of West Central Scotland constituencies used to calculate results is available on request.	North-Rhine-Westphalia (Federal Returning Officer). Nord-Pas-de-Calais (French Ministry of the Interior; lefigaro.fr). Merseyside (UK Electoral Commission). West Central Scotland (UK Electoral Commission). N. Moravia (Czech Statistical Office)Parliamentary Election data years used were: 1992, 1997, 2001 and 2005 for UK. 1993, 1998, 2002 and 2007 for France. 1990, 1998, 2002 and 2005 for Germany. 1992, 1998, 2002 and 2006 for the Czech Republic. UK data from the UK Electoral Commission, compiled (for 1987-2001) by David Boothroyd on the ‘United Kingdom Election Results’ website (www.election.demon.co.uk), and (for 2005) by the ‘UK Political Info’ website (www.ukpolitical.info)

Figure/table	Description	Definition	Sources and notes
Figure 3.72	Voter turnout, N. Moravian district and WCS parliamentary constituency: 2005-06.	Voter turnout at Czech and UK parliamentary elections, for West Central Scotland UK parliamentary constituencies and N. Moravian districts. A full list of West Central Scotland constituencies used to calculate results is available on request.	N. Moravia (Czech Statistical Office, 2006). West Central Scotland (UK Electoral Commission, 2005). UK data from the UK Electoral Commission, compiled (for 1987-2001) by David Boothroyd on the 'United Kingdom Election Results' website (www.election.demon.co.uk), and (for 2005) by the 'UK Political Info' website (www.ukpolitical.info)
Figure 3.73	Voter turnout, Ruhr area kreise and WCS parliamentary constituency: 2005.	Voter turnout at German and UK parliamentary elections, for West Central Scotland UK parliamentary constituencies and Ruhr area kreise. A full list of West Central Scotland constituencies used to calculate results is available on request.	Ruhr area (Federal Returning Officer, 2005). West Central Scotland (UK Electoral Commission, 2005). UK data from the UK Electoral Commission, compiled (for 1987-2001) by David Boothroyd on the 'United Kingdom Election Results' website (www.election.demon.co.uk), and (for 2005) by the 'UK Political Info' website (www.ukpolitical.info)
Figure 3.74	Average monthly mean daily irradiation, selected European cities, January-December 2005.	Daily irradiance, measured in watt-hours per square metre (Wh/m ²), averaged over 12 months, January-December 2005. Irradiation is the power received per area, measured in watt-hours per square metre (Wh/m ²).	Solar Radiation Data: http://www.soda-is.com/eng/services/services_radiation_free_eng.php .
Figure 3.75	Average sunshine hours per annum, 1971-2000.	Total hours of sunshine, based on monthly averages for January-December.	Met Office Data, 1971-2000, calculated from station data.
Figure 3.76	Rooms per person, C. 1999-2002.	Calculated as: (Number of rooms in private dwellings/Total number of residents in region).	West Central Scotland (GROS Census of Population 2001). Merseyside (ONS Census of Population 2001). Limburg (CBS Dutch Virtual Census 2001). N. Ireland (NISRA Census of Population 2001). Saxony (Federal Statistical Office). Saxony-Anhalt (Federal Statistical Office). North-Rhine Westphalia (Federal Statistical Office). Wallonia (Enquête Socio-économique 2001). Nord-Pas-de-Calais (Recensement de la Population 1999). Silesia (Central Statistical Office of Poland (GUS) Census of Population and Housing 2002). N. Moravia (CSO Population and Housing Census 2001). Note: Wallonia figures are estimates, based on the assumption that households with 8 or more rooms had 8 rooms available. German figures are based on similar assumption that households with 7 or more rooms had 7 rooms available

Figure/table	Description	Definition	Sources and notes
Figure 3.77	Overcrowding using Bedroom Standard measure.	Percentage of households in selected UK regions who failed the Bedroom Standard. 'Bedroom standard' is used as an indicator of occupation density. The number of bedrooms required by each household reflects the age, sex and relationship of household members to each other. Where the number of actual bedrooms available falls below the required number, the Bedroom standard is deemed to be failed.	Swansea & the S. Wales Coalfields (Living in Wales 2008). Merseyside (Survey of English Housing, 2000-01, 2001-02 and 2002-03 combined). West Central Scotland (SHCS 2003-06). N. Ireland (Continuous Household Survey (NI) 2004-05).
Figure 3.78	Percentage of overcrowded households, WCS CHPs and Silesian powiats/merged powiats, 2001-02.	Calculated as: (Number of overcrowded households / Total number of private households)*100. Overcrowded households are those where there are fewer than two common rooms (excluding bathrooms) available per household member.	GRO (S) Census of Population 2001 (WCS). Central Statistical Office of Poland (GUS) Census of Housing and Population 2002 (Silesia).
Figure 3.79	Percentage of overcrowded households, by WCS CHPs and Nord-Pas-de-Calais arrondissements/part-arrondissements, 1999-01.	See above for definitions.	GRO (S) Census of Population 2001 (WCS). INSEE recensement (Census of Population) 2006 (Nord-Pas-de-Calais).
Figure 3.80	Percentage of adults who feel safe in their local neighbourhood after dark.	Percentage of adults aged 15+ who feel very or fairly safe walking alone in their local neighbourhood after dark. (For West Central Scotland and Swansea and the South Wales Coalfields, adults aged 16+). Proxy geographies used: North-Rhine Westphalia (Ruhr area), North-West England (Merseyside).	West Central Scotland (Scottish Household Survey 2007/08). Swansea and the South Wales Coalfields (Living in Wales Survey 2008). All other regions (European Social Survey Rounds 1 – 4 combined).
Figure 3.81	Percentage of adults who always felt safe in their neighbourhood.	Percentage of adults aged 15+ reporting they always felt safe in their (city) neighbourhood, for the following European cities: Leipzig, Dortmund, Lille, Belfast, Liege, Glasgow, Ostrava	Urban Audit 2009 Perception Study, available at: http://ec.europa.eu/regional_policy/themes/urban/audit/index_en.htm .

Figure/table	Description	Definition	Sources and notes
Figure 3.82	Percentage of adults who felt safe or very safe walking alone in their local neighbourhood after dark.	Percentage of adults aged 16+ who feel very or fairly safe walking alone in their local neighbourhood after dark for three regions.	South Wales-Gwent (British Crime Survey 2007-08). Merseyside (British Crime Survey 2007-08). West Central Scotland (Scottish Crime and Justice Survey 2008-09).
Figure 3.83	Case study – Ruhr – neighbourhood safety.	Percentage of adults aged 45-74 who felt safe in their local neighbourhood after dark, by gender, Mulheim, Bochum & Essen (2000-03) and Greater Glasgow (2003).	Heinz Nixdorf Recall Study (Mulheim, Bochum & Essen) and Scottish Health Survey 2003 (Greater Glasgow).
Figure 3.84	Case study – N. Moravia – neighbourhood safety.	Percentage of adults aged 45-69 who felt safe in their local neighbourhood after dark, by gender, Karvina/Havirov (HAPIEE Study 2002-05) and Glasgow City 2005-06.	Karvina/Havirov (HAPIEE Study 2002-05). Glasgow City (Scottish Household Survey 2005-06).
Figure 3.85	Male smoking rates.	Percentage of adult males smoking at least one cigarette daily. Age bands were as follows: <ul style="list-style-type: none"> • South East Wales, 16+ • N. Ireland, 16+ • Saxony, 15+ • Merseyside, 16+ • Wallonia, 16-100 • Saxony-Anhalt, 15+ • North-Rhine-Westphalia, 15+ • West Central Scotland, 16+ • Nord-Pas-de-Calais, 15-75 • Limburg, 12+ • South Poland, 15+ • West Central Scotland, 16+ Proxy geographies used: S. Poland (Silesia), North-Rhine Westphalia (Ruhr area), S.E. Wales (Swansea and the South Wales Valleys).	S.E. Wales (Welsh Health Survey, 2003-04). N. Ireland (Northern Ireland Health and Wellbeing Survey, 2005-06). Saxony (German Microcensus, 2005). Merseyside (Health Surveys for England, 2003-05). Wallonia (Belgium Health Interview Survey, 2004). Saxony-Anhalt (German Microcensus, 2005). North-Rhine-Westphalia (German Microcensus, 2005). Nord-Pas-de-Calais (Insee, Conseil régional, Drass, ORS, Cresge - Enquête Santé, 2002-03). Limburg (Centraal Bureau voor de Statistiek, 2004-07). West Central Scotland (Scottish Household Survey 2003-04). S. Poland (GATS Poland, 2009-2010).
Figure 3.86	Female smoking rates.	Percentage of adult females smoking at least one cigarette daily. Age bands were same as for males (see above).	See above.

Figure/table	Description	Definition	Sources and notes
Figure 3.87	Percentage of adults who were daily smokers, WCS districts and Ruhr area kreise.	Percentage of adult females smoking at least one cigarette daily. Age bands were 16+ for WCS and 18+ for Ruhr area.	West Central Scotland (Scottish Household Survey, 2003-04). Ruhr area (LIGA.NRW, 2005).
Figure 3.88	Case study – The Ruhr cities– smoking.	Percentage of adults aged 45-74 reporting that they smoked regularly/occasionally, by gender, Mulheim, Bochum & Essen (2000-03) and Greater Glasgow (2003).	Heinz Nixdorf Recall Study (Mulheim, Bochum & Essen) and Scottish Health Survey 2003 (Greater Glasgow).
Figure 3.89	Case study – The Ruhr cities– smoking.	Percentage of adults aged 45-74 reporting that they used to smoke, by gender, Mulheim, Bochum & Essen (2000-03) and Greater Glasgow (2003).	See above.
Figure 3.90	Case study – The Ruhr cities– smoking.	Percentage of adults aged 45-74 reporting that they had never smoked, by gender, Mulheim, Bochum & Essen (2000-03) and Greater Glasgow (2003).	See above.
Figure 3.91	Case study – N. Moravia – smoking.	Percentage of adults aged 45-69 reporting that they smoked regularly, by gender, Karvina/Havirov and Glasgow City.	Glasgow City (Scottish Household Survey 2005-06). Karvina/Havirov (HAPIEE Study 2002-05).
Figure 3.92	Adult males in Greater Glasgow and Nord-Pas-de-Calais, frequency of drinking alcohol: 2002-2005.	Frequency of alcohol consumption, adult males, Greater Glasgow and NPdC, 2002-05. Categories shown: <ul style="list-style-type: none"> • Never/ex-drinkers • Once a month or less • Two or three times a month • Once or twice a week • Three or more times a week Greater Glasgow used as proxy for WCS: adults aged 15+ for NPdC and adults aged 16+ for Greater Glasgow.	Greater Glasgow (Greater Glasgow Health and Wellbeing Survey 2005). Nord-Pas-de-Calais (Insee, Conseil régional, Drass, ORS, Cresge - Enquête Santé 2002-2003).
Figure 3.93	Exceeding weekly alcohol limits: Northern Ireland.	Percentage of adults aged 16+ exceeding weekly drinking limits, by gender: Northern Ireland and Greater Glasgow.	N. Ireland (Northern Ireland Health and Social Wellbeing Survey 2005-06). Greater Glasgow (Scottish Health Survey 2003).
Figure 3.94	Exceeding weekly alcohol limits: Ruhr cities.	Percentage of adults aged 45-74 exceeding 21/14 units of alcohol a week, by gender, Mulheim, Bochum & Essen (2000-03) and Greater Glasgow (2003).	Greater Glasgow (Scottish Health Survey 2003). Mulheim, Bochum & Essen (Heinz Nixdorf Recall Study).

Figure 3.95	Percentage of problem drinkers in Greater Glasgow and Nord-Pas-de-Calais.	Bar chart showing percentage of adult drinkers with a CAGE score of 2+, by gender, Greater Glasgow and NPdC, 2002-03. Non-drinkers and those who did not respond to all four CAGE questions in SHeS were excluded from the base.	Greater Glasgow (Scottish Health Survey 2003). Nord-Pas-de-calais (Insee, Conseil régional, Drass, ORS, Cresge - Enquête Santé 2002-2003).
Figure 3.96	Percentage of problem drinkers in Greater Glasgow and Karvina/Havirov.	Percentage of adults aged 45-69 with a CAGE score of 2+, by gender, Karvina/Havirov and Greater Glasgow. Note: Those who did not respond to all four CAGE questions in SHeS were excluded from the base.	Greater Glasgow (Scottish Health Survey 2003). Karvina/Havirov (HAPIEE Study 2002-05).
Figure 3.97	Percentage of adults eating fruit daily, Greater Glasgow and Nord-Pas-de-Calais,; 2003-2005.	Percentage of adults aged 15+/16+ reporting they ate at least one portion of fruit yesterday.	Greater Glasgow (Scottish Health Survey 2003). Nord-Pas-de-calais (Insee, Conseil régional, Drass, ORS, Cresge - Enquête Santé 2002-2003).
Figure 3.98	Percentage of adults eating vegetables daily, Greater Glasgow and Nord-Pas-de-Calais,; 2003-2005.	Percentage of adults aged 15+/16+ reporting they ate at least one portion of vegetables yesterday.	Greater Glasgow (Scottish Health Survey 2003). Nord-Pas-de-calais (Insee, Conseil régional, Drass, ORS, Cresge - Enquête Santé 2002-2003).
Figure 3.99	Frequency of adult fish consumption, by gender, Greater Glasgow and Nord-Pas-de-Calais,; 2002-2005..	Percentage of adults aged 15+/16+ reporting they ate fish: <ul style="list-style-type: none"> • Every day/almost every day • At least once a week • Less often than once a week • Rarely or never 	Greater Glasgow (Scottish Health Survey 2003). Nord-Pas-de-calais (Insee, Conseil régional, Drass, ORS, Cresge - Enquête Santé 2002-2003).
Figure 3.100	Frequency of adult non-diet soft drink consumption, by gender, Greater Glasgow and Nord-Pas-de-Calais,; 2002-2005.	Percentage of adults aged 15+/16+ reporting they drank non-diet soft drinks: <ul style="list-style-type: none"> • Every day/almost every day • At least once a week • Less often than once a week • Rarely or never 	Greater Glasgow (Scottish Health Survey 2003). Nord-Pas-de-calais (Insee, Conseil régional, Drass, ORS, Cresge - Enquête Santé 2002-2003).

Figure/table	Description	Definition	Sources and notes
Figure 3.101	Percentage of adults reporting they ate 5 or more portions of fruit or veg yesterday, by gender and UK post-industrial region: 2003-08	Adults aged 16+ reporting they ate at least 5 portions of fruit or veg yesterday, for the following regions: <ul style="list-style-type: none"> • South East Wales (Swansea & S. Wales Valleys, plus Cardiff, Vale of Glamorgan & Monmouthshire) • Northern Ireland • Greater Glasgow & Clyde (proxy for WCS) • Greater Merseyside (Knowsley, Liverpool, St. Helens, Sefton, Wirral and Halton) 	South East Wales (Welsh Health Survey 2008). Northern Ireland (Northern Ireland Social Health and Wellbeing Survey 2008). Greater Glasgow & Clyde (Scottish Health Survey 2008). Merseyside (Health Survey for Greater Merseyside 2003).
Figure 3.102	Case study N. Moravia - Obesity	Percentage of adults aged 45-69 classified as obese (BMI 30+), Kavira/Havirov (N. Moravia) 2002-05 and Greater Glasgow 2003, by gender	Greater Glasgow (Scottish Health Survey 2003). Karvina/Havirov (HAPIEE Study 2002-05).
Figure 3.103	Low birth-weight babies as a percentage of all births	(All live births < 2500g/All live births) * 100	Northern Ireland (Child Health System 2005 – accessed via: http://www.dhsspsni.gov.uk/births2005.pdf) Saxony (Statistisches Landesamt des Freistaates Sachsen, Statistik der Geburten, 2005-06). Silesia (Polish Demographic Yearbook 2009, table 60 (95), 2008). Swansea & the South Wales Coalfields (ONS, 2005-06). Northern Moravia (CSO, 2005-06). Nord-Pas-de-Calais (certificat de santé du 8ème jour transmis aux services de PMI du Nord et du Pas-de-Calais 2005-06). Saxony-Anhalt (Statistisches Landesamt Sachsen-Anhalt, Halle (Saale), 2009; Statistik der natürlichen Bevölkerungsbewegung 2005-06). Merseyside (ONS, 2005-06). Limburg (The Netherlands Perinatal Registry; all live born infants with gestational age >= 22 weeks of gestation, 2005-06). Ruhr area (regional authority of NRW for data handling and statistics, LIGA Indicator Number 3. 51 (L); statistic of native population movement 2002 – 2007 2005-06). West Central Scotland (ISD Scotland 2004). Wallonia (SPMA Unit of Epidemiology Scientific Institute of Public Health, Brussels, Belgium 1995-1999).

Figure/table	Description	Definition	Sources and notes
Figure 3.104	Percentage of births to mothers under the age of 20.	(All live births where mother aged <20/All live births) * 100.	N. Moravia (CSO Regional Yearbooks 2005-06). West Central Scotland (GROS 2005-06). All other regions (Eurostat 2005-06). <i>Note: Figure for Ruhr area is an estimate based on data for Dusseldorf, Munster & Arnsberg.</i>
Figure 3.105	Percentage of births to mother aged 15-17, WCS districts and Ruhr area kreise.	(All live births where mother aged <18/All females aged 15-17) * 100.	West Central Scotland (GRO (S)). Ruhr area (IT. NRW).
Figure 3.106	Terminations of pregnancy.	Number of legal reported induced abortions/number of women aged 15-44*1000. Note: Data unavailable for Silesia. Abortions is legal in Poland but under very restrictive conditions. The national ratio (per 1000 live births) was 1 per 1000 in 2005-06. In 1985-86, the figure was 202 per 1000.	N. Ireland (NISRA; ONS, 2005 & 2006 combined data). Wallonia (Sensoa, 2004, 2007, 2009; Statistics Belgium, 2009; van Bussel, Johan, 1 Sept. 20062005 & 2006 combined data). Saxony, Saxony-Anhalt and North-Rhine Westphalia (Arbeitskreis Lebensrecht; Federal Statistics Office, 2005 & 2006 combined data). Limburg (IGZ (Netherlands; Eurostat, 2005 & 2006 combined data). Nord-Pas-de-Calais (INED; INSEE, 2005 & 2006 combined data). Swansea & the South Wales Coalfields (DoH, ONS, 2005 & 2006 combined data). West Central Scotland (GROS; ISD Scotland, 2005 & 2006 combined data). N. Moravia (CSO, 2005 & 2006 combined data). Greater Merseyside (ONS; DoH, 2006).
Figure 3.107	Case Study – terminations of pregnancy rates in N. Moravia & WCS: 1982-2007.	Number of legal reported induced abortions /number of women aged 15-44*1000.	West Central Scotland (GROS; ISD Scotland). N. Moravia (Czech Statistical Office).

Figure/table	Description	Definition	Sources and notes
Figure 3.108	Case Study – terminations of pregnancy rates in West Central Scotland local authorities and N. Moravian districts: 2004-06.	Number of legal reported induced abortions /number of women aged 15-44*1000.	West Central Scotland (GROS; ISD Scotland). N. Moravia (Czech Statistical Office).
Figure 3.109	Case Study – terminations of pregnancy rates in N. Moravia & WCS: 1992-2007.	Number of legal reported induced abortions among females aged 13-19/number of women aged 15-19*1000.	West Central Scotland (GROS; ISD Scotland). N. Moravia (Czech Statistical Office).
Figure 3.110	Case Study – terminations of pregnancy rates in West Central Scotland local authorities and N. Moravian districts: 2007-08.	Number of legal reported induced abortions among women aged 13-19/number of women aged 15-19*1000.	West Central Scotland (GROS; ISD Scotland). N. Moravia (Czech Statistical Office).
Figure 3.111	Percentage of babies breastfed at 8-10 days.	Percentage of babies who were breastfed (either mixed or exclusively), 8-10 days after birth, recorded through administrative data..	WCS (ISD Scotland health visitor reviews, first visit c. 10 days after birth, combined data for 2005 & 2006). NPdC (PMI du PMI du Nord et du Pas-de-Calais, 8 th day certificate, combined data for 2005 & 2006).
Figure 3.112	Percentage of babies breastfed at birth.	Percentage of mothers (of whom breastfeeding status known), reporting breastfeeding at birth, recorded through administrative data.	Swansea & S. Wales (National Community Child Health Database, 2008). WCS (ISD Scotland analysis, 2008-09). Merseyside (APHO community health profiles, 2008-09).
Figure 3.113	Percentage of babies breastfed at 8-10 days, WCS CHPs and Nord-Pas-de-Calais arrondissements/part-arrondissements.	Percentage of babies who were breastfed (either mixed or exclusively), 8-10 days after birth, recorded through administrative data.	WCS (ISD Scotland health visitor reviews, first visit c. 10 days after birth, combined data for 2005 & 2006). NPdC (PMI du PMI du Nord et du Pas-de-Calais, 8 th day certificate, combined data for 2005 & 2006).

Figure/table	Description	Definition	Sources and notes
Figure 4.1	Scatter plot showing disposable per capita income (in Euros) and female life expectancy.	Female life expectancy at birth using Chiang (II) methodology, per capita income after taxes and benefits.	<p>Disposable per capita income Office for National Statistics, Regional Gross Disposable Household Income – Time Series Table 3.1. Office for National Statistics and (G)ROS population figures Eurostat Regional GDHI data, £ sterling/Euro conversion table Figure for Ruhr is a crude average of the Düsseldorf, Münster and Arnsberg figures.</p> <p>Female life expectancy at birth Calculated by GCPH and reported in the first Aftershock report.</p>

Appendix B: Formal citations of data

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 CBS Dutch National Census 2001.
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 Polish Central Statistical Office (GUS) Polish Population and Housing Census 2002.

Appendix C: The regions defined

In the majority of cases, regions are defined by 'NUTS' geographies. NUTS stands for the 'Nomenclature of Territorial Units for Statistics' and is the geographical system of national and sub-national geographies used by Eurostat. There are three main levels:

- NUTS 1: population size range: 3 million – 7 million
- NUTS 2: 800,000 – 3 million
- NUTS 3: 150,000 – 800,000.

Regions are generally defined by either one, or a group of, NUTS 1, NUTS 2 or NUTS 3 geographies, all of which relate to different administrative boundaries in each country (and which are shown in the table below). More information on NUTS geographies is available from the Eurostat website here:

http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction

There are exceptions to this (e.g. West Central Scotland, defined by a set of local authority areas) details of which are included in the table below.

As stated in the Preface to Part Three (Section 3.1), on occasion 'proxy' geographies have been used where data were not available for the 'ideal' geographical definition of a region. Where this is the case, details are included within the table in Appendix A.

Region	Country	Population at 2005 ¹	Geographical composition
The Ruhr area	Germany	5,289,251	<p>Defined by the following 15 NUTS 3 geographies, relating to a combination of districts ('kreise') and urban districts ('kreisfreie stadt'). The NUTS 3 codes are shown in brackets.</p> <ul style="list-style-type: none"> • Duisburg (DEA12) • Essen (DEA13) • Mülheim an der Ruhr (DEA16) • Oberhausen (DEA17) • Wesel (DEA1F) • Bottrop (DEA31) • Gelsenkirchen (DEA32) • Recklinghausen (DEA36) • Bochum (DEA51) • Dortmund (DEA52) • Hagen (DEA53) • Hamm (DEA54) • Herne (DEA55) • Ennepe-Ruhr-Kreis (DEA56) • Unna (DEA5C)
Saxony-Anhalt	Germany	2,482,447	The federal state ('land') of Saxony-Anhalt (in German, Sachsen-Anhalt) – NUTS 1 code DEE.
Saxony	Germany	4,285,019	The federal state ('land') of Saxony (Sachsen) – NUTS 1 code DED.

¹ Population at 2005 for all regions except those in France, for which the year is 2003.
See Appendix 4 for sources of population data.

Region	Country	Population at 2005 ¹	Geographical composition
Wallonia	Belgium	3,404,969	Belgian autonomous 'région' of Wallonia (NUTS 1: BE3).
Nord-Pas-de-Calais	France	4,024,420	French 'région' of Nord-Pas-de-Calais (NUTS 2: FR30).
Silesia (Katowice)	Poland	4,685,775 (Katowice: 4,151,325)	<p>The majority of the data presented in the report relate to the province (voivodeship) of Silesia (Slaskie) (NUTS 2: PL22).</p> <p>In the first 'Aftershock' report (and in a small number of analyses in this report), the region was defined as Katowice, which was an old (pre-1999) Polish province of the same name. The boundaries of the province were redrawn in 1999, and the Katowice voivodeship became part of the slightly larger Silesia.</p>
Northern Moravia	Czech Republic	1,889,930	Northern Moravia is made up of two of the Czech Republic's 13 regions ('kraje'), namely Moravskoslezský (translated as the Moravian-Silesian region, and defined by NUTS 3 code CZ080), and Olomoucký (Olomouc – NUTS 3 code CZ071).
Limburg	Netherlands	1,149,143	'Province' of Limburg (NUTS 2 NL42).

Region	Country	Population at 2005¹	Geographical composition
Merseyside	England	1,366,900	Metropolitan county - NUTS 2 code UKD5.
Swansea and South Wales Coalfields	Wales	1,114,500	Defined by the following NUTS 3 codes: UKL15 (Central Valleys, made up of the Merthyr Tydfil & Rhondda Cynon Taff local authorities); UKL16 (Gwent Valleys, covering the Blaenau Gwent, Caerphilly & Torfaen local authorities); UKL17 (including Bridgend and Neath Port Talbot local authorities); UKL18 (Swansea local authority).
Northern Ireland	Northern Ireland	1,724,408	All of Northern Ireland has been used. In NUTS terms, the region/country is defined by NUTS 1 code UKN.
West Central Scotland	Scotland	2,114,590	Defined in terms of 11 local authority areas. These are: East Ayrshire, East Dunbartonshire, East Renfrewshire, Glasgow City, Inverclyde, North Ayrshire, North Lanarkshire, Renfrewshire, South Ayrshire, South Lanarkshire, and West Dunbartonshire.

Appendix D: Selected further reading

Note: this is clearly not an exhaustive list of relevant texts, but rather a small number of more relevant reading material for those who want further information on some of the regions (and issues around deindustrialisation) described in this report.

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Appendix E: West Central Scotland and Merseyside compared

The following ‘spine’ chart is included within the four ‘case study’ reports in an attempt to summarise (very crudely) the extent to which health and its determinants (or at least data on health and its determinants that are available from routine data sources) differs between West Centre Scotland (WCS) and the other regions. To emphasise the point made in Part Four of the report, i.e. that West Central Scotland and Merseyside have remarkably similar health determinant profiles, we include here a similar ‘spine’ for these two regions.

Note that this is only intended to be a very **approximate** presentation of relative differences in the data for the two areas. Note also that not all the indicators presented in the report are included: the selection has been principally based on the indicators for which a ‘subjective judgement’ could be made (i.e. that it is ‘worse’ to have poorer health; that it is ‘better’ with higher levels of educational attainment)¹.

The Figure demonstrates that the only indicators for which WCS appears to be worse than Merseyside are (a) life expectancy (b) alcohol-related mortality (liver cirrhosis deaths) and (c) some elements of the physical environment (and for the latter the data are extremely limited: only overcrowding and sunlight (annual irradiance) are presented here). For other aspects of health & function, prosperity & poverty, inequalities, the social environment, behaviour and child & maternal health, WCS is either slightly better than, or very similar to, Merseyside.

¹ Where indicators have 95% confidence intervals calculated, the ‘better’, ‘similar’ and ‘worse’ categories have been allocated with regard to overlapping/non-overlapping confidence intervals. When 95% confidence intervals were not available, subjective judgements have been used to determine whether values in WCS were sufficiently ‘better’ (higher or lower depending on the indicator), similar or ‘worse’. Of course, a proper study of statistical significance would be based on specific statistical tests: however, the intention here is simply present a *very approximate overview* of differences between regions, rather than a detailed statistical dissection of the data.

Key indicators summary for WCS compared to Merseyside									
	Indicator	WCS Value	M'side Value	Measure	Is WCS worse than, similar to, or better than Merseyside?	Time Period	WCS Region	M'side Region	Fig
Health & Function	Life expectancy - males	72.8	74.8	yrs		2003-05	WCS	M	2.6
	Life expectancy - females	78.3	79.4	yrs		2003-05	WCS	M	2.7
	Self-assessed health - 'good' or 'very good'	71.8	70.8	%		2008	GGC	M	3.9
	Adults with limiting long-term limiting illness	28.0	23.6	%		2008	GGC	M	3.11
	Mean life satisfaction score	7.3	7.2	avg		2008	GGC	NWE	3.12
Prosperity & poverty	Male employment rate	74.0	66.3	%		2008	WCS	M	3.24-25
	Female employment rate	62.0	69.7	%		2008	WCS	M	3.26-27
	Unemployment rate	5.8	7.3	%		2008	WCS	M	3.18
	Men aged 25-49 not in employment	21.7	23.5	%		2001	WCS	M	3.28
	Perceived adequacy of income	11.4	13.8	%		2007	WCS	NWE	3.34
	Income deprived	17.5	19.1	%		2005	WCS	M	3.37
Inequalities	Population living in relative poverty	18.9	21.1	%		2003	SWS	M	3.43
	Income inequality	0.30	0.29	Gini		2003-04	WCS	M	3.41
Social Environment	Lone parent households	31.1	33.2	%		2001	WCS	M	3.56
	Single person households	33.8	32.5	%		2001	WCS	M	3.60
	Adults (25-64) who are married	63.0	58.8	%		2001	WCS	M	3.64
	Education: tertiary (level 5/6) qualifications	33.3	28.3	%		2006	SWS	M	3.52
	Education: no/low (<level 3) qualifications	27.3	31.7	%		2006	SWS	M	3.53
	Social capital - religious participation	52.7	49.9	%		2007	WCS	NWE	3.67
	Social capital - no interest in politics	14.1	20.6	%		2007	WCS	NWE	3.69
	Social capital - voter turnout	58.3	53.7	%		2005	WCS	M	3.70
Physical Environment	Climate - average annual irradiance	2460	2670	w		2005	G	L	3.74
	Overcrowding (bedroom standard)	4.9	2.3	cr		2000-03	WCS	M	3.77
	Perception of neighbourhood safety	70.6	61.1	%		2007-08	WCS	M	3.80
Behaviour	Male smoking prevalence	29.9	26.9	%		2003-04	WCS	M	3.85
	Female smoking prevalence	28.4	26.4	%		2003-04	WCS	M	3.86
	Diet: 5 fruit/vegetables per day (males)	18.0	23.0	%		2003-08	GGC	GM	3.101
	Diet: 5 fruit/vegetables per day (females)	21.0	23.0	%		2003-08	GGC	GM	3.101
	Male liver cirrhosis mortality	46.3	23.6	sr		2003-05	WCS	M	a/s
	Female liver cirrhosis mortality	19.6	14.8	sr		2003-05	WCS	M	a/s
Child & Maternal	Births to teenage mothers	8.5	8.4	%		2005-06	WCS	M	3.104
	Breastfeeding at birth	52.5	50.8	%		2008-09	WCS	M	3.112
	Infant deaths	5.6	4.4	cr2		2003-05	WCS	M	a/s
	Low birth-weight babies	7.8	7.6	%		2004-08	WCS	M	3.103

Key - yrs: years; avg: average score; Gini: Gini coefficient; w: Wh/m² (Watt hours per square metre); cr: crude rate per head of population; sr: standardised rate (directly aged-standardised rate per 100,000 population); WCS: West Central Scotland; GGC: Greater Glasgow & Clyde; SWS: South West Scotland; Scot: Scotland; G: Glasgow; M: Merseyside; GM: Greater Merseyside; NEW: North West England; L: Liverpool; a/s: presented in first 'Aftershock' report.

Limburg

Merseyside

Nord-Pas-de-Calais



Northern Ireland

North Moravia

Ruhr

Saxony

Saxony-Anhalt

Silesia

Swansea & South
Wales Coalfields

Wallonia

West Central Scotland