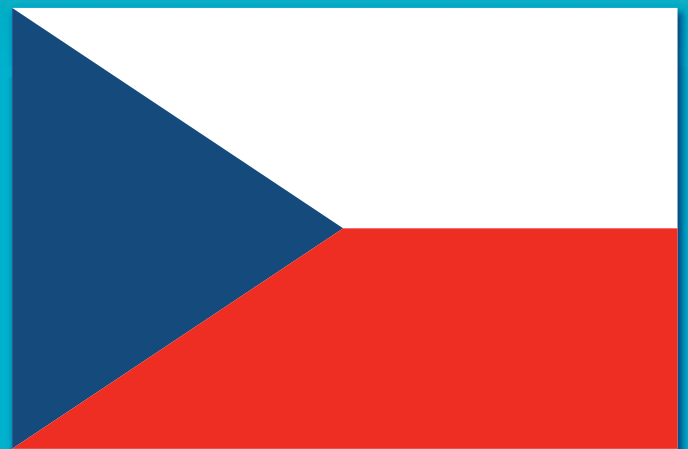**Glasgow Centre for Population Health**

Case Study

Health and its determinants in West Central Scotland compared to Northern Moravia in the Czech Republic

Case study: Health and its determinants in West Central Scotland compared to Northern Moravia in the Czech Republic.

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Contents

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Other providers of relevant data are listed, and acknowledged, in the main report.

Finally, thanks to Andrew Lyon and Kelda McLean at GCPH for helpful comments on earlier drafts of this report.

Summary

This case study – along with three others – is an accompaniment to the report entitled: *Health and its determinants in Scotland and other parts of post-industrial Europe: the 'Aftershock of Deindustrialisation' study - phase two.*

The case study presents the results of analyses of routine administrative and survey data for two post-industrial regions: West Central Scotland (WCS) and Northern Moravia in the Czech Republic. This is part of a larger set of analyses exploring the reasons behind the poor health profile of WCS in comparison to other parts of Europe that have also experienced the economic, social and health impact of post-industrial decline.

The scope of this report is limited to comparisons of routine administrative and survey data in these two regions: for a broader discussion of the historical, cultural and social context in which these differences should be viewed, readers should refer to the main report.

As with the main report, this case study presents comparisons of data within the context of two overarching research questions:

1. Can WCS's relatively slower rate of health improvement 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 this post-industrial region of the Czech Republic?

Analyses of a large set of existing data were undertaken in an attempt to answer these questions. The principal findings of these analyses are that:

- Male mortality rates, although currently slightly higher in Northern Moravia, are improving faster relative to WCS. Female mortality rates are lower, and improving faster.
- WCS generally compares favourably in economic terms e.g. lower unemployment, higher car ownership, better perceived adequacy of income.

- However, there is some evidence of greater within-region inequality in relation to income in WCS.

- Interesting differences emerge in relation to adults living alone: the percentage in this category is much higher in WCS.

- In terms of educational attainment, WCS has a relatively higher percentage of its adult population educated to tertiary level, but also a higher percentage with no educational qualifications at all.

- In terms of health behaviours, alcohol harm is higher in WCS; obesity and smoking levels are similar, with the exception of female smoking in WCS which is higher.

- Lone parent households are much more common in WCS.

- Other issues relating to maternal wellbeing compare poorly: numbers of infant deaths, teenage mothers, teenage terminations of pregnancy, and low birth-weight babies are all relatively higher in WCS.

- There is some evidence of greater area-based inequalities in WCS: this appears true in relation to mortality, and also with regard to some key indicators such as lone parent households, economic activity and aspects of educational attainment. However, these comparisons are constrained by the different geographical units of measurement in the Scottish and Czech region.

A number of potentially important differences have been identified for WCS in relation to Northern Moravia, but it is difficult to quantify their impact on health outcomes, or on the rate of improvement in health outcomes. However, these results add to the evidence that economic issues alone do not appear to be the principal issue. Further research is required, focussing not on routine administrative data, but based on the collation of new data to test specific hypotheses. This is now being undertaken as part of a programme of work focussing on the key WCS city, Glasgow, and its most comparable post-industrial cities in the UK, Liverpool and Manchester. The results of that research will be available in 2012.

1. Introduction: background, aims and structure

1.1 Background

This document is an accompaniment to the main report entitled: *Health and its determinants in Scotland and other parts of post-industrial Europe: the 'Aftershock of Deindustrialisation' study - phase two*. The overall aims of the project, its history, rationale, and development are discussed in greater detail within that report.

This document presents the results of analyses of routine administrative and survey data for two post-industrial regions: West Central Scotland (WCS) and Northern Moravia in the Czech Republic. As described fully in the main report, this is part of a larger set of analyses exploring the reasons behind the poor health profile of WCS in comparison to other parts of Europe that have also experienced the economic, social and health impact of post-industrial decline.

The overall project has been undertaken in response to the results of analyses presented in the first *Aftershock* report[1]: this was published in 2008 by the Glasgow Centre for Population Health and NHS Health Scotland with a full title of: *'The Aftershock of Deindustrialisation – trends in mortality and other parts of post-industrial Europe'*. On the basis that the effects of post-industrial decline are often blamed for Scotland's – and particularly West Central Scotland's (WCS) – enduring poor health status, that first stage of research 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 of research was to investigate the reasons why this was the case.

1.2 Aims & Structure

As with the main report, this case study presents comparisons of data within the context of two overarching research questions:

1. Can the slower rate of health improvement seen in WCS compared to Northern Moravia 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 this post-industrial region of the Czech Republic?

These questions are addressed within the following structure – following Section 2 (a description of the Czech region, and a reminder of some of the results presented in the first *Aftershock* report) and Section 3 (a brief outline of the main sources of data used in the case study's analyses), the rest of the report presents a series of comparisons of relevant data under similar heading to those used in the main report. These are:

- Further analyses of health outcomes

- Poverty and prosperity

- Population

- Social environment

- Physical environment

- Health behaviours

- Child and maternal health

The final section attempts to summarise the main findings from all the data presented within the above parts of the case study.

2. Northern Moravia and the 'aftershock' of deindustrialisation

Northern Moravia is an area of the Czech Republic which shares a border with one of the other post-industrial regions studied in this project, the Polish region of Katowice (Figure 2.1). Other characteristics are also shared: Katowice, together with further parts of southern Poland and a large section of Northern Moravia, historically formed the old central European region of Silesia, a natural resource-rich expanse which over the last few centuries has been owned, and fought over, by a number of different ruling bodies including the Austrian Habsburg Monarchy, the Kingdom of Prussia, and the German Empire. Indeed, as referenced elsewhere in this report, the Katowice province in Poland is now known as Silesia, while one half of the Czech region is called Moravskoslezský, which translates as Moravia-Silesia. The Polish and Czech regions also share a number of characteristics in terms of environment, industrial history, and 20th Century political change, while in health terms they are of course the two post-industrial regions highlighted in the main report (and its predecessor, the first *Aftershock* report[·]) which have seen their female life expectancy recently overtake that of WCS, with life expectancy for males likely to follow suit in the near future.

Figure 2.1

2.1 The 'region' of Northern Moravia

The name 'Northern Moravia' relates to the historical *kraj* (governmental region) of Severomoravský, an administrative division of the old Czechoslovakia. It now no longer exists in administrative terms, but is instead comprised of two new (since 2000) Czech *kraje*[i]: Moravskoslezský (Moravia-Silesia) and Olomoucký (Olomouc). This is the geographical definition of the region used both in the first *Aftershock* report, and the main accompanying report. It is probably fair to say, however, that in terms of comparability with WCS and the other deindustrialised regions included in this project, Moravskoslezský is a more 'relevant' part of Northern Moravia than Olomoucký, the latter being less industrial (and deindustrialised) and more rural in nature. For the sake of consistency, however, we will continue to refer to the whole Northern Moravian area in these pages, although in fact data for this case study have been analysed (where possible) not only for all of

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[i] *Kraje* is the plural of *kraj* (government region)

Northern Moravia, but also separately for Moravskoslezský and Olomoucký (and indeed for sub-areas within both those *kraje*). Despite the dissimilarities in the nature of the two *kraje*, in fact very little differences emerge between the two in relation to the health and social data analysed.

2.2 A brief industrial history of the region

Northern Moravia was already a heavily industrialised area before 1945, having laid the foundations as early as 1736 with the discovery of the first coal mines in the region[2,3,4,5]. Before World War II, it enjoyed a higher per capita output than France, with an economy based on light manufacturing (leather goods, armaments, motor vehicles and other luxury goods)[6]. Under Communism, industrial employment in this region expanded by almost 50,000[7]. The region became the focus for Czechoslovakia's development of heavy industry, in particular mining and steel, with the city of Ostrava becoming the country's 'city of coal and iron' and the 'steel heart of the republic'[8]. By the 1980s the region was producing 25 million tonnes of coal, approximately 75 per cent of the total production of the country as a whole – and this at a time when Czechoslovakia's coal production was, per capita, the largest in the world. The suitability of the region's hard coal resulted in the location in the region of the country's largest steelworks: by 1983 the huge Gottwald plant in Vítkovice employed 30,000 people and boasted production of 8 million tonnes of steel per year[9].

However, it has been argued that this specialisation in steel and coal imposed during the Communist era diverted the economy of the region towards 'planned obsolescence'[6]. With the so-called Velvet Revolution in 1989 and the ending of Communism, the region, and its industrial output, changed considerably. Restructuring and privatisation resulted in a significant reduction in levels of coalmining; indeed, around Ostrava, the former 'city of coal and iron', there are no longer any mines in operation, with the last batch of coal having been excavated in 1994. The Vítkovice blast furnaces were turned off in 1998 – the plant now concentrating on metallurgy and machine

engineering instead – with the steel industry in the region now centred in Nová Huť (the 'New Steel Works', also based in Ostrava). Despite these changes, and the associated loss of employment – a fifth of industrial jobs were shed between 1993 and 2005 (80,000 from a total of 425,000) – in fact the region remains heavily industrialised. The local mining company, OKD, is still the biggest employer in the region and the third largest in the Czech Republic[10, 11].

2.3 The *Aftershock* report revisited

As described in the main report, the first *Aftershock* report showed that overall levels of life expectancy in Northern Moravia were increasing faster than was the case in WCS, with female life expectancy already higher in the Czech region. The detailed analyses of age and cause-specific mortality also highlighted a number of important differences in these health outcomes between the two areas. For example, in comparison to WCS, Northern Moravia has significantly lower rates of mortality from: chronic obstructive pulmonary disease (COPD) for both males and females; oesophageal cancer (again, for males and females); lung cancer (females only); and, among 15-44 year olds, suicide. Among both males and females, death rates from liver cirrhosis are also now lower in Northern Moravia than in WCS as a result of the striking increase in WCS rates that initiated in the early 1990s. Examples of the above are illustrated in Figures 2.2-2.6. In contrast, however, Northern Moravia also exhibits significantly *higher* rates than WCS for a number of causes. These include: colorectal cancer, stomach cancer, external causes[ii] (especially among males of older working age) and motor vehicle transport accidents (MVTAs) (a sub-set of the external causes category). Examples of these are shown in Figures 2.7-2.9.

[ii] 'External causes' is a grouping of ICD (International Classification of Diseases) codes which includes: accidents, intentional self-harm (suicide), assault, complications of medical and surgical care, and other external causes of accidental injury (e.g. drowning, exposure to fire, poisoning)

Figures 2.2-2.6: examples of causes of death where rates are lower in N. Moravia than in WCS:

Figure 2.2 Chronic obstructive pulmonary disease (COPD) (females)

**Female deaths from COPD & related conditions: WCS and N. Moravia
EASRs (3 year rolling averages) 1991-2005 (all ages)**
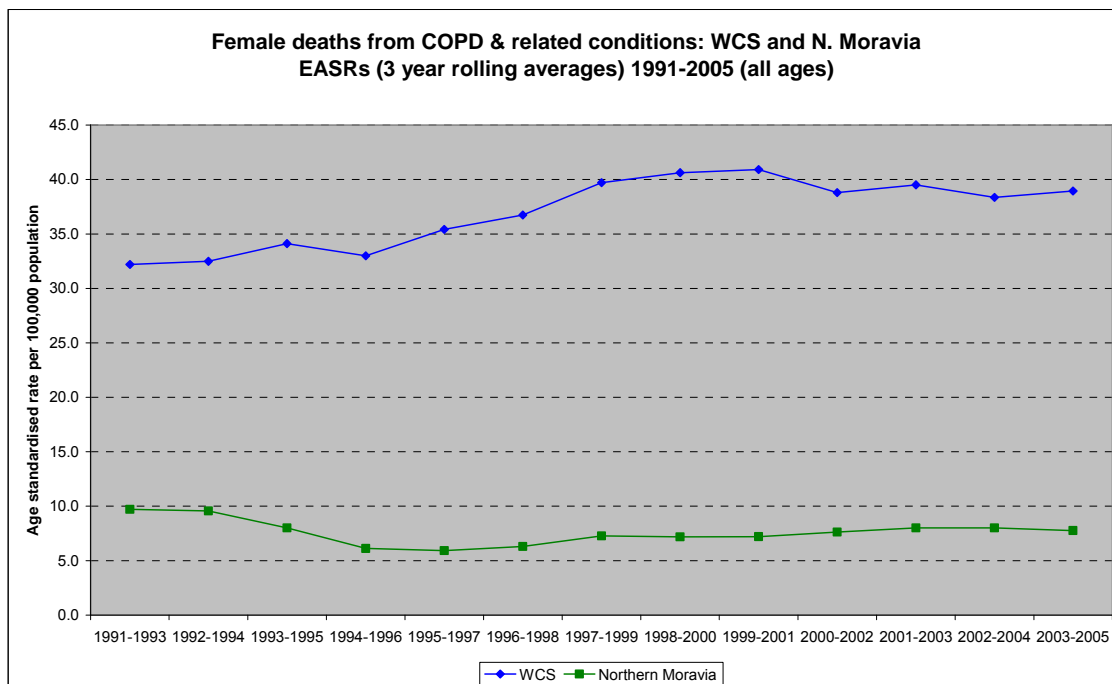
Figure 2.3 Oesophageal cancer (males)

**Male deaths from oesophageal cancer: WCS and N. Moravia
EASRs (3 year rolling averages) 1991-2005 (all ages)**
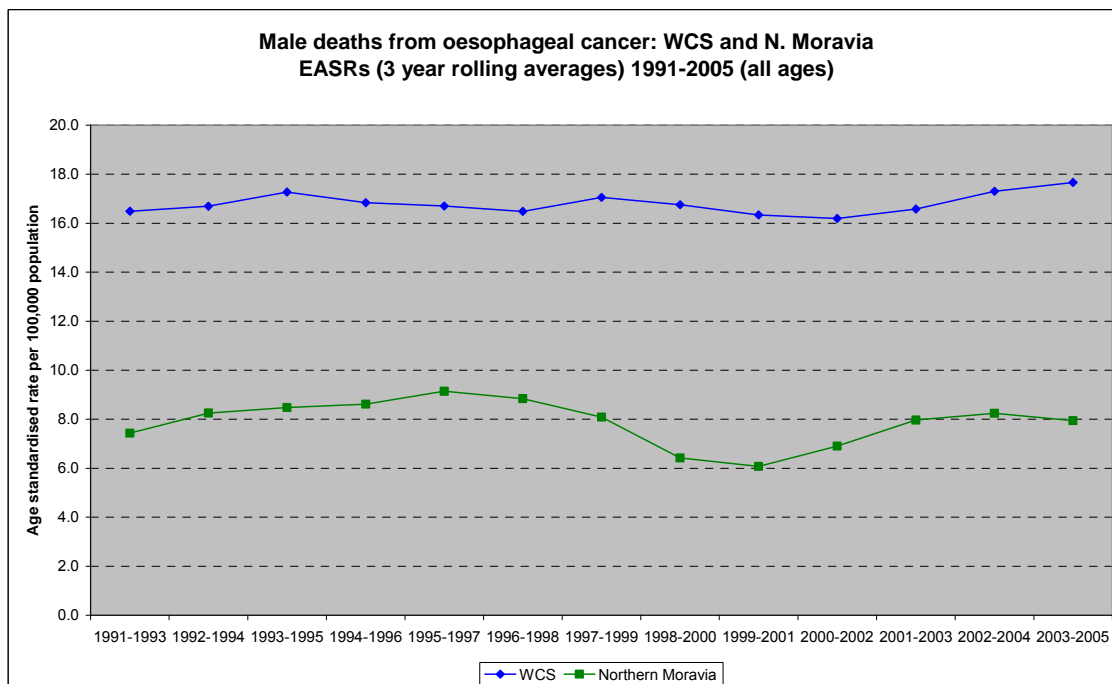
Figure 2.4 Lung cancer (females)

**Female deaths from lung cancer: WCS and N. Moravia
EASRs (3 year rolling averages) 1991-2005 (all ages)**
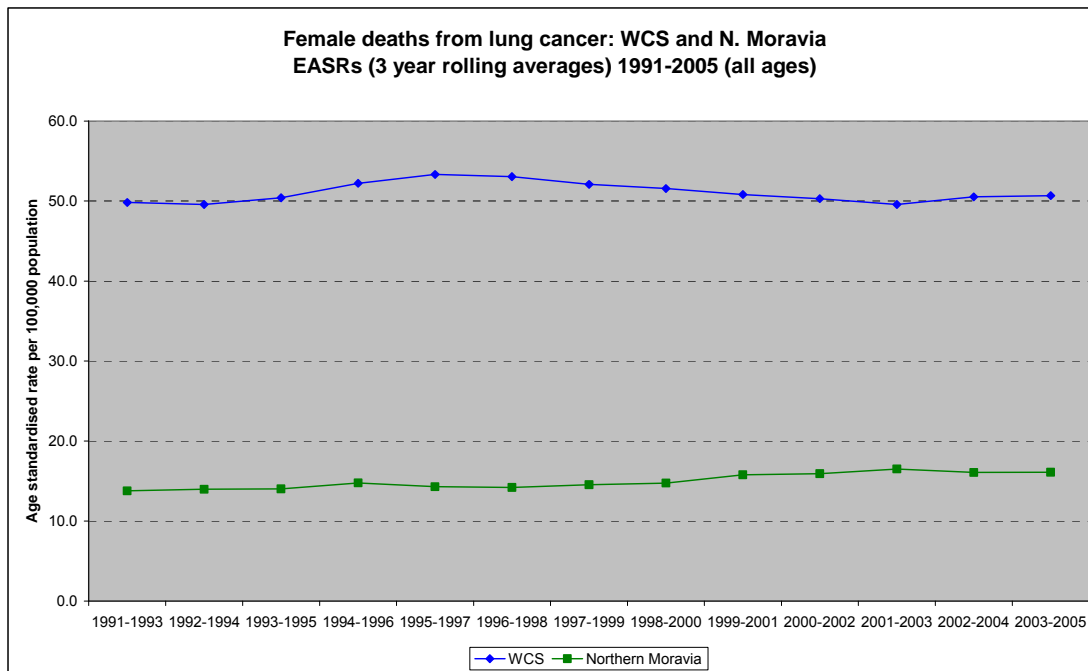
Figure 2.5 Suicide (females, 15-44)

**Female deaths from suicide (inc. deaths from undetermined intent):
WCS and N. Moravia; EASRs (3 year rolling averages) 1991-2005 (all ages)**
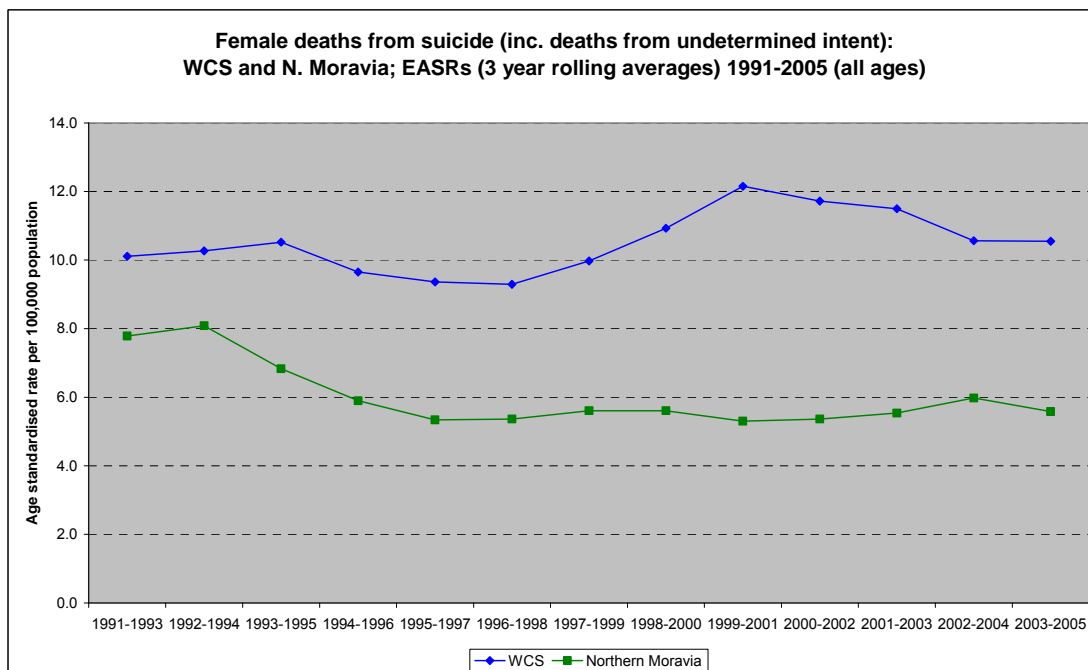
Figure 2.6 Liver disease and cirrhosis (males)

Male deaths from chronic liver disease & cirrhosis: WCS and N. Moravia
EASRs (3 year rolling averages) 1991-2005 (all ages)
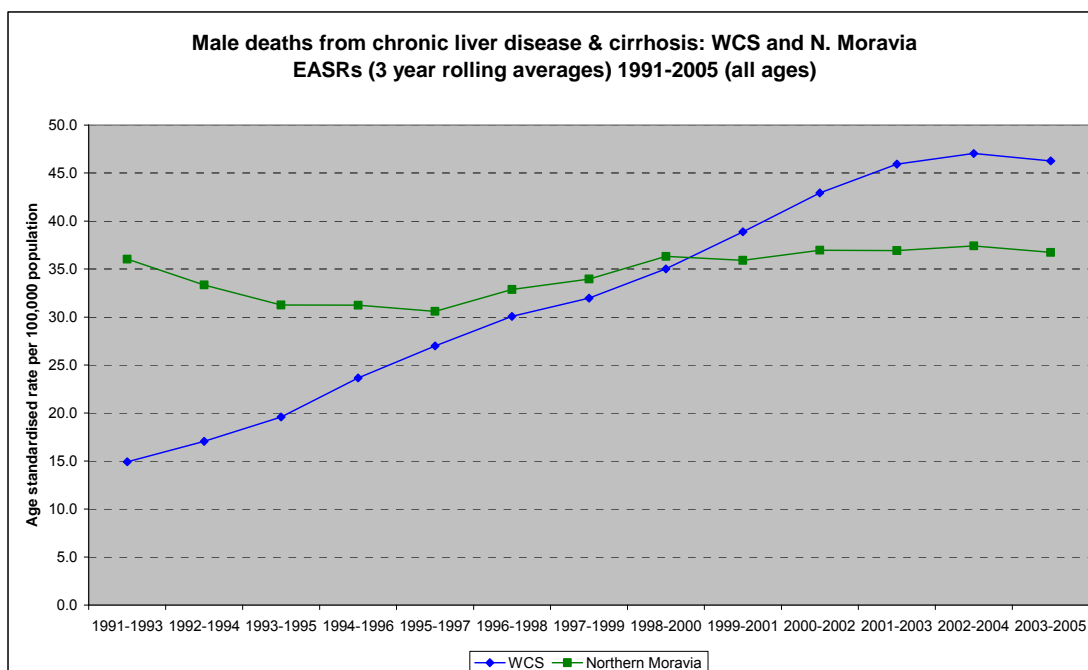
Figures 2.7-2.9: examples of causes of death where rates are higher in N. Moravia than in WCS:

Figure 2.7 Colorectal cancer (males)

Male deaths from colorectal cancer: WCS and N. Moravia
EASRs (3 year rolling averages) 1991-2005 (all ages)
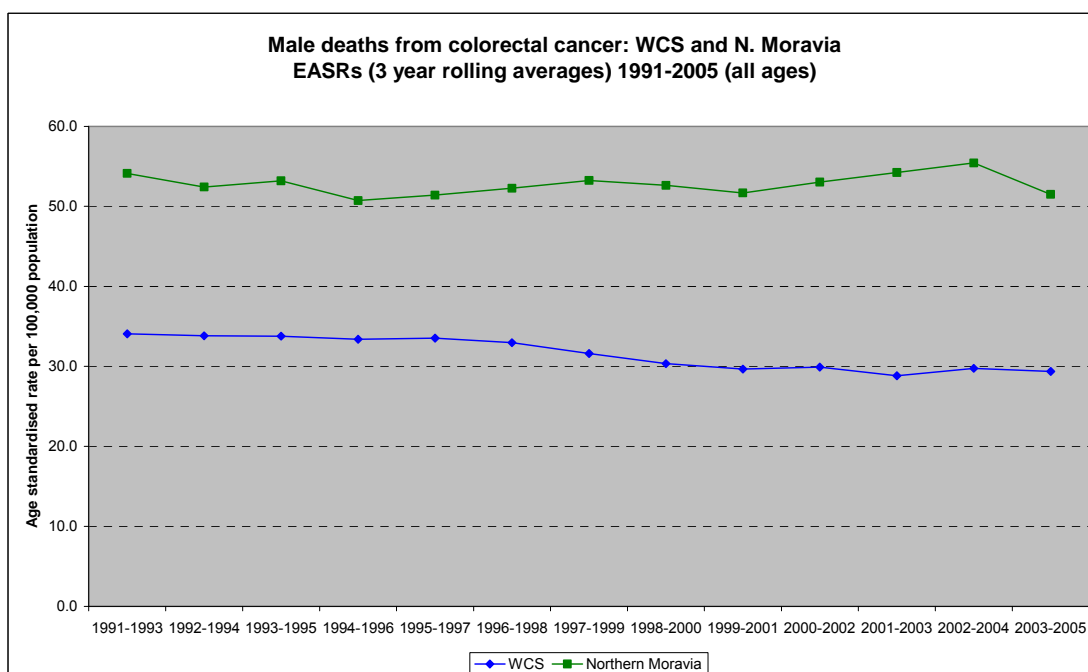
Figure 2.8 Stomach cancer (females)

**Female deaths from stomach cancer: WCS and N. Moravia
EASRs (3 year rolling averages) 1991-2005 (all ages)**
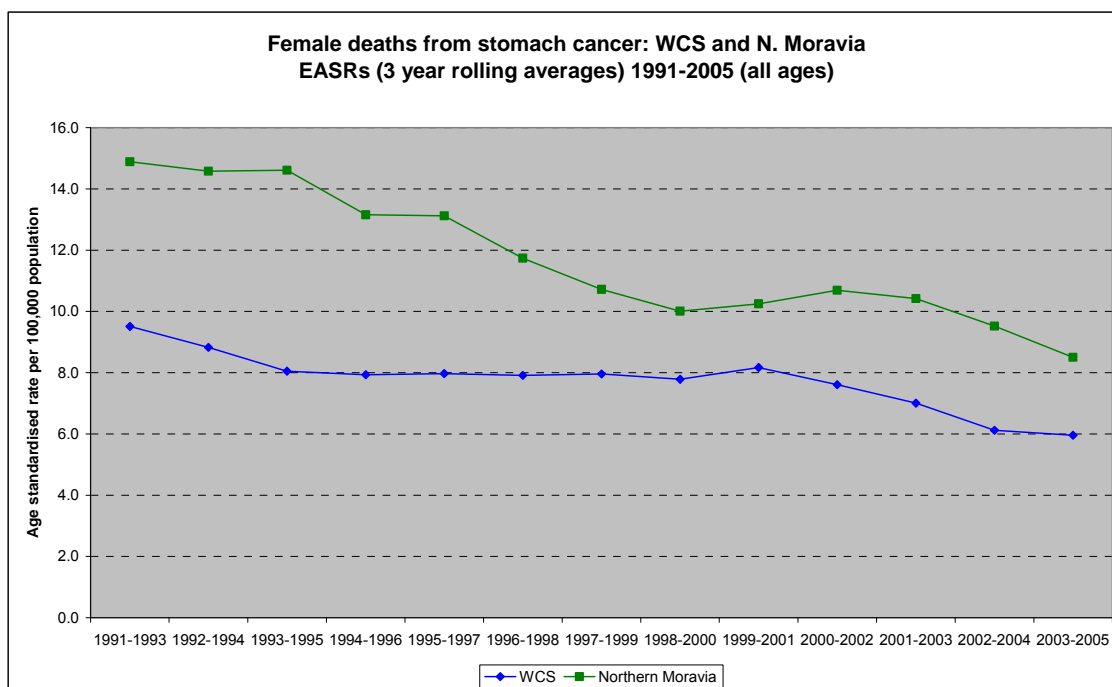
Figure 2.9 Motor vehicle transport accidents (males)

**Male deaths from motor vehicle transport accidents: WCS and N. Moravia
EASRs (3 year rolling averages) 1991-2005 (all ages)**
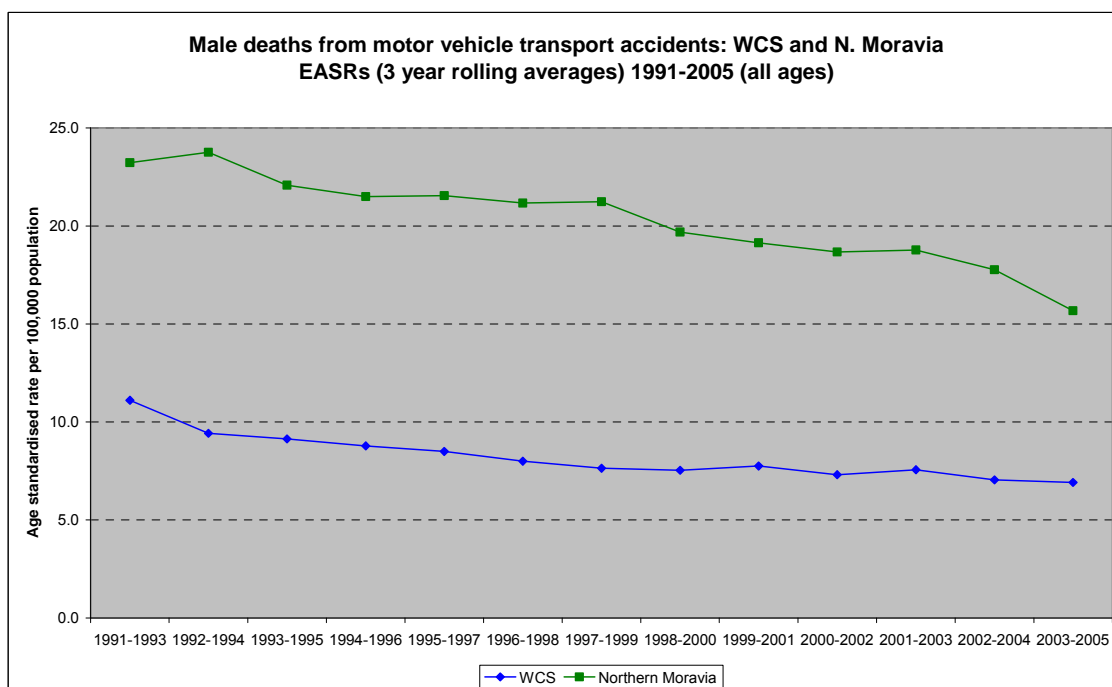
The first *Aftershock* report also showed health in Northern Moravia (particularly within Moravskoslezský) to be among the poorest of all the Czech *kraje*. This is not surprising, given its status as a post-industrial region, and its associated relatively poor social and economic indicators[iii]. What was surprising, however, was that despite its faster improving health status relative to WCS, the available data suggested that its socio-economic profile was also considerably *worse* than that of WCS. As outlined in the main introduction to this report, however, the indicators used in the latter analyses were limited, and a more in-depth analysis of socio-economic factors would be required to establish if this were truly the case. This case study attempts to present such an analysis.

[iii] For example, recorded unemployment levels are among the highest of any Czech region (Source: 2006 data quoted in I2SARE (www.i2sare.eu).

3. Data sources

3.1 Main sources

As with the main report and the other three case studies, the analyses presented here are based on a number of different data sources, all of which are fully listed in Appendix 1. In relation to the Czech data, however, this case study relies principally on two sources:

1. Detailed census and other administrative data made available by colleagues in the Czech Statistical Office, the Institute of Health Information and Statistics of the Czech Republic, and the Regional Public Health Authorities of Moravskoslezský and Olomoucký.

2. Data obtained from the HAPIEE study[12]: a cohort study of over 35,000 individuals aged 45-69 living in Eastern Europe, including locations within the Czech Republic[iv,]. Two major towns within the Moravskoslezský part of Northern Moravia were included (Havirov and Karviná), with representative data from around 1,600 residents collected. Where possible and appropriate, we have made comparisons with matching data for residents of the city of Glasgow (or, on occasion, the wider Greater Glasgow area) of the same age group. Figure 3.1 below compares 45-69 age breakdown of Glasgow's population with age-specific sample derived from the HAPIEE study. This shows that the two samples are reasonably comparable, but with some small differences i.e. a higher proportion of 65-69 year olds and a lower proportion of 45-49 year-olds in the Czech sample. This should be borne in mind when interpreting the results.[v]

[iv] See http://www.ucl.ac.uk/easteurope/hapiee.html for more details of the HAPIEE study.

[v] Note that it has not been possible to adjust for these age differences in any of the analyses; however, as only one five-year age group is greatly different (45-49), the impact on any results is unlikely to be significant.

Figure 3.1

Age structure:
HAPIEE data for Karvina/Havirov vs. GRO(S) estimates for Glasgow City
Source: HAPIEE Study; GRO(S)
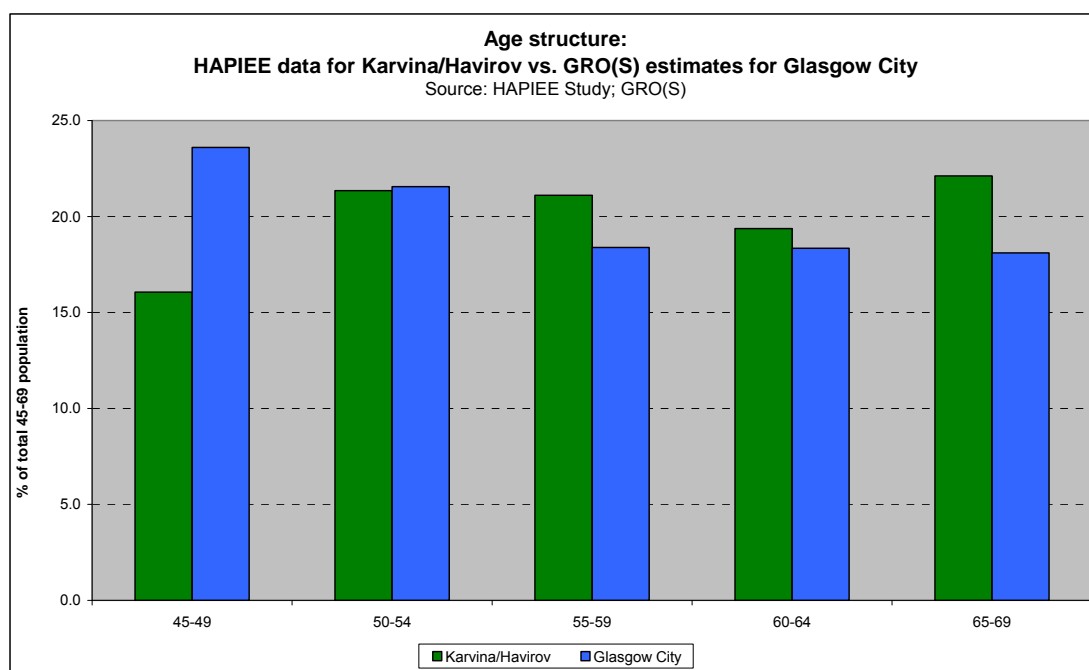
3.2 Geography

As stated above, in the analyses summarised in the following pages we present Czech administrative data for the two *kraje* (regions) of Northern Moravia, Moravskoslezský and Olomoucký, as well as for the 11 *okresy* (districts) that are located within those *kraje*[vi]. Given the different characteristics of the two regions (again, referred to above) the two sets of areas are distinguished in the charts by being presented in two different shades (green for Moravskoslezský and its districts; green & yellow for Olomoucký and its districts). These are principally compared to West Central Scotland (WCS), as defined in the main section of the report[vii], although on occasion we use proxy geographies such as Strathclyde, Greater Glasgow or

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[vi] There are currently six okresy (districts) within Moravskoslezský (Ostrava; Opava; Bruntál; Frýdek místek; Karviná; Nový Jičín), and five within Olomoucký (Olomouc; Prostějov; Přerov; Šumperk; Jeseník). Across the whole region they have an average population size of around 170,000 people, ranging from just over 40,000 (Jeseník) to almost 340,000 (Ostrava-město).

[vii] This standard definition relates to the 11 local authority areas, namely East Ayrshire, East Dunbartonshire, East Renfrewshire, Glasgow City, Inverclyde, North Ayrshire, North Lanarkshire, Renfrewshire, South Ayrshire, South Lanarkshire, and West Dunbartonshire.

South West Scotland. This is discussed in more detail in Section 3.1 of the main report.

For these principal sub-regional analyses, we compare the districts (*okresy*) with either (depending on the indicator in question) WCS local authority areas or WCS Community Health Partnership Areas (effectively very similar to local authorities, but enabling Glasgow City to be broken down into five sub-city sections[viii]). Figure 3.2 shows the population sizes of these CHPs and the *okresy*: within a considerable degree of variation, they compare reasonably well. Clearly, however, when WCS local authorities are shown instead of CHPs, the population size of Glasgow City exceeds that of the largest *okres*[ix] by a considerable margin.

Figure 3.2

Total population, 2007: N. Moravia districts (okresy) and WoS CHP areas
Source: Czech Statistical Office; GRO(S)
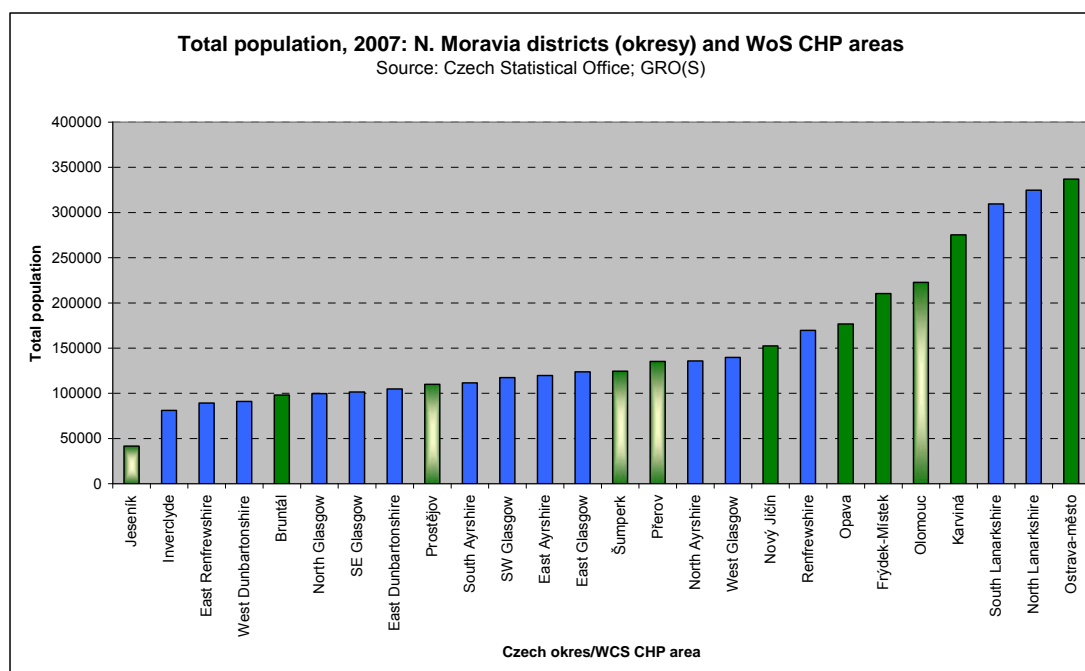
[viii] Note that at the start of this project, there were five Community Health Partnerships in Glasgow City (actually referred to as Community Health and Care Partnerships (CH(C)Ps), although in this report we use the generic CHP abbreviation used elsewhere in WCS). However, in 2010 the boundaries of the Glasgow areas were redrawn, with the number of CHP areas reduced to three. This report presents data based on the old (five) boundaries.

[ix] *okres* is the singular form of *okresy* (districts).

Finally, it should be noted that the *kraje* of Moravskoslezský and Olomoucký only came into being in 2000. A number of geographical changes took place in 1991 and 2000. To show trend data before 2000, and especially before 1991, we have used 'proxy' geographical areas. These are almost identical to Moravskoslezský and Olomoucký – but not exactly. However, the differences have little impact on the data shown. Further details are included in Appendix 1.

4. Further analyses of health outcomes

As has already been outlined above, the original *Aftershock* report contained detailed analyses of life expectancy and all-cause and cause-specific mortality trends. The purpose of this section is to:

1. Update the life expectancy trends

2. Examine some of these data at a sub-regional level

In addition we also look at some relevant data in relation to recorded levels of self-assessed health in parts of Northern Moravia and West Central Scotland.

4.1 Updated life expectancy trends

In the first *Aftershock* report life expectancy data between WCS and Northern Moravia were shown up to the end of 2005. Here we update those trends to include the most recent comparable data up to the end of 2007. As Figures 4.1 and 4.2 below illustrate, these show a continued narrowing of the gap in relation to male life expectancy (Figure 4.1), and a continued widening of the gap in relation to female life expectancy (Figure 4.2); in both cases, health continues to improve faster in the Czech region.

Figure 4.1

**Estimates of <u>male</u> life expectancy at birth,
West Central Scotland & Northern Moravia 1982-2007 (3-year averages)**
Source: calculated from data from GRO(S) and Czech Statistical Office

Figure 4.2

**Estimates of <u>female</u> life expectancy at birth,
West Central Scotland & Northern Moravia 1982-2007 (3-year averages)**
Source: calculated from data from GRO(S) and Czech Statistical Office
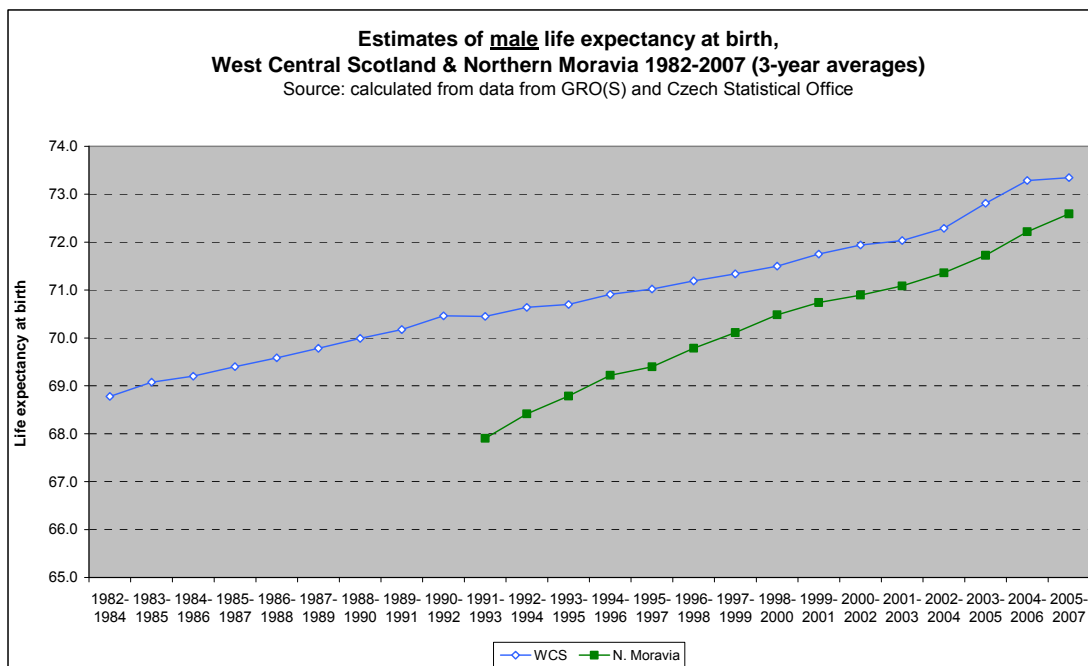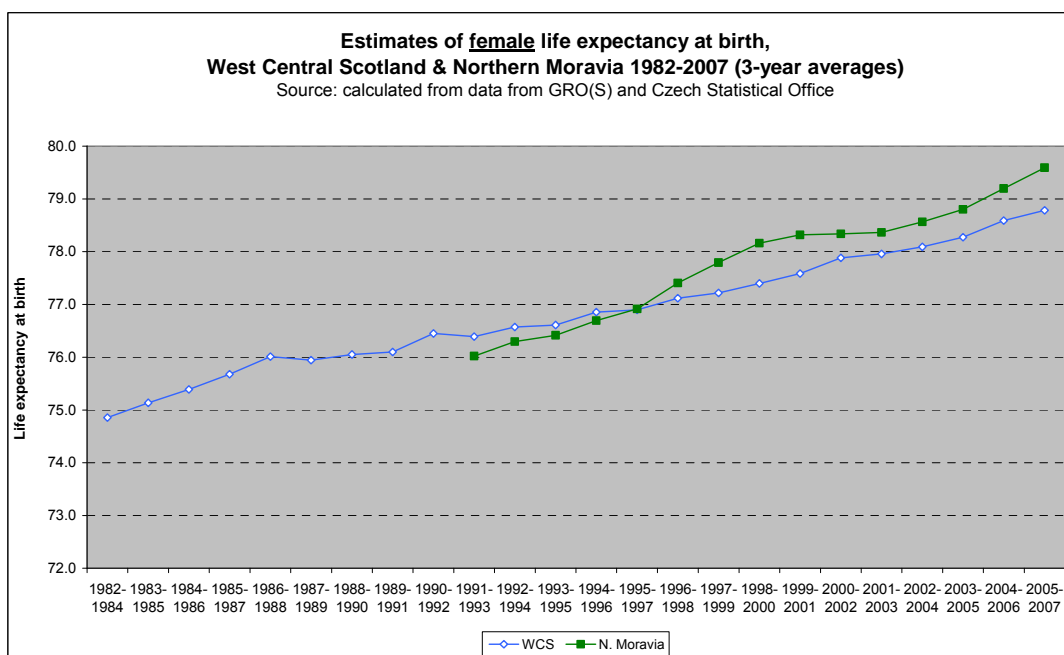
4.2 Analyses of sub-regional life expectancy

Figures 4.3 and 4.4 present similar trends, but this time with the Northern Moravian data broken down into the two *kraje* of Moravskoslezský and Olomoucký. These show that in the case of males, life expectancy in the (less industrial/deindustrialised) *kraj* of Olomoucký is now identical to that in WCS, despite having been significantly lower in the early 1990s. In the case of females, life expectancy in both Moravskoslezský and Olomoucký is now higher than that recorded in WCS.

Figure 4.3

Figure 4.4

Estimates of <u>female</u> life expectancy at birth, West Central Scotland & Northern Moravian *kraje* (Olomoucký & Moravskoslezský), 1982-2007 (3-year averages)
Source: calculated from data from GRO(S) and Czech Statistical Office
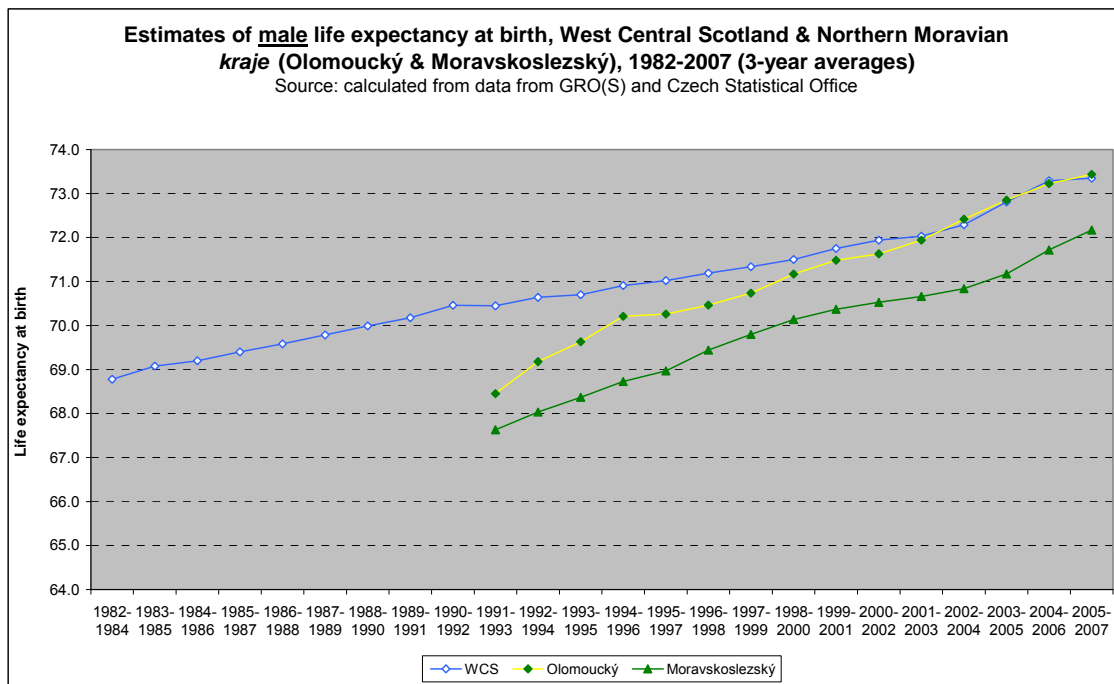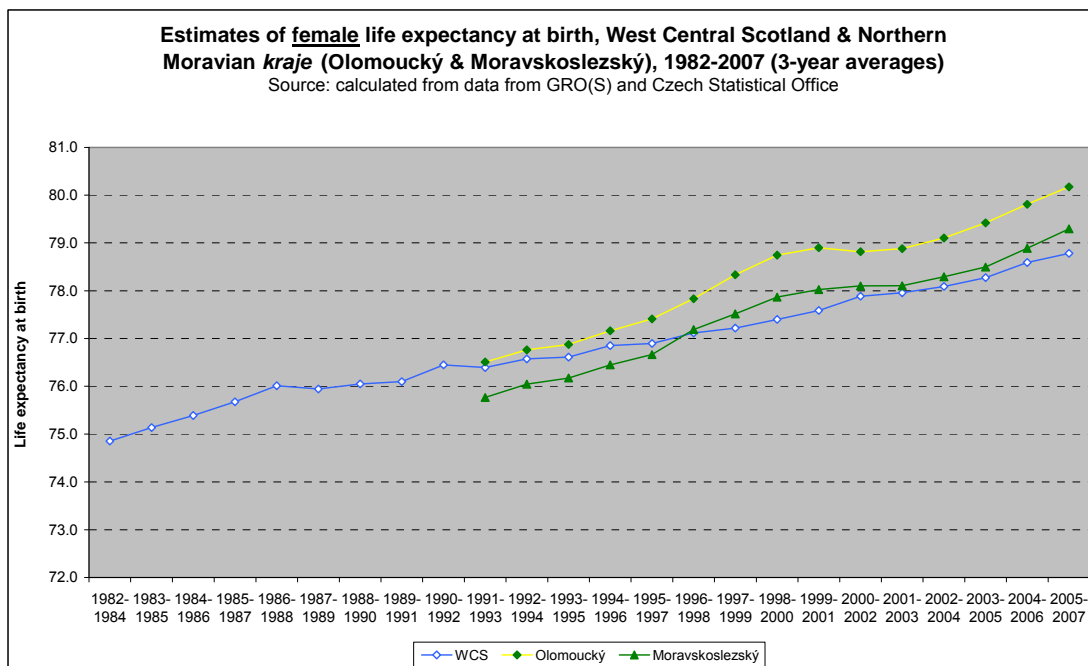
Concentrating on the 'core' Moravskoslezský region alone, Figure 4.5 below presents similar male life expectancy trends for the two *okresy* (districts) which have, respectively, the highest and lowest life expectancy figures in this area. This shows that this faster rate of improvement in life expectancy (relative to WCS) is seen not only in the 'best' district, but also in the 'worst' (and indeed other data analysed – but not shown here – confirm that this relative faster rate of improvement is seen in *all* the *okresy* of Northern Moravia). As Figure 4.6 shows, this is also true of female life expectancy: the district with the lowest life expectancy in Moravskoslezský (and, therefore, in all of Northern Moravia) has also overtaken the figure for WCS.

Figure 4.5

Estimates of <u>male</u> life expectancy at birth, West Central Scotland & Moravskoslezský (incl. highest/lowest *okres* (district)), 1982-2007 (3-year averages)
Source: calculated from data from GRO(S) and Czech Statistical Office

Figure 4.6

Estimates of <u>female</u> life expectancy at birth, West Central Scotland & Moravskoslezský (incl. highest/lowest *okres* (district)), 1982-2007 (3-year averages)
Source: calculated from data from GRO(S) and Czech Statistical Office

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It is also of interest to compare these sub-regional trends in Northern Moravia with similar sub-regional data for WCS (in this case, local authority areas). This is shown in Figure 4.7 (males) and Figure 4.8 (females) which compare 'best' and 'worst' districts of Northern Moravia in this regard with the similar 'best' and 'worst' local authority areas of WCS. For both males and females, the data suggest that both the gap in life expectancy, and, crucially., the extent to which the gap has increased over time, are much greater in WCS compared to Northern Moravia. This is a fairly crude analysis of the data, and there are major caveats in terms of the respective population sizes of the areas being compared (e.g. in Figure 4.7 the two Northern Moravian *okresy* shown have population sizes of around 220,000 and 275,000; the sizes of the two Scottish local authorities areas range from just over 100,000 (East Dunbartonshire) to almost 600,000 (Glasgow)). Taken at face value, however, the data suggest there may be important differences in the nature and development of health inequalities in WCS compared to this ex-Communist region of the Czech Republic.

Figure 4.7

**Estimates of <u>male</u> life expectancy at birth, W. Central Scotland (& highest/lowest LA)
and Northern Moravia (& highest/lowest *okres*), 1982-2007 (3-year averages)**
Source: calculated from data from GRO(S) and Czech Statistical Office

Legend: WCS — N. Moravia — Olomouc (highest NM) — Karviná (lowest NM) — E. Dunb'nshire (highest WCS) — Glasgow City (lowest WCS)

Figure 4.8

**Estimates of <u>female</u> life expectancy at birth, West of Scotland (& highest/lowest LA)
and Northern Moravia (& highest/lowest okres), 1982-2007 (3-year averages)**
Source: calculated from data from GRO(S) and Czech Statistical Office

Legend: WCS — N. Moravia — Olomouc — Ostrava-město — E. Renfrewshire (highest WCS) — Glasgow City (lowest WCS)

Finally, it is worth noting that the differences in improvement rates in life expectancy between Northern Moravia and WCS mirror those seen at the national level. As Figures 4.9 and 4.10 show, life expectancy in the Czech Republic as a whole is increasing faster than in Scotland as a whole: as we have also seen at the post-industrial regional level, for males the gap is closing fast (Figure 4.9), while for females, it has been closed. This suggests that any lessons learned from these regional analyses may have important implications at the national level.

Figure 4.9

Male life expectancy at birth, Scotland and the Czech Republic, 1974-2007
Source: Scotland & European HfA database; GRO(S); Czech Statistical Office

Figure 4.10

Female life expectancy at birth, Scotland and the Czech Republic, 1974-2007
Source: Scotland & European HfA database; GRO(S); Czech Statistical Office
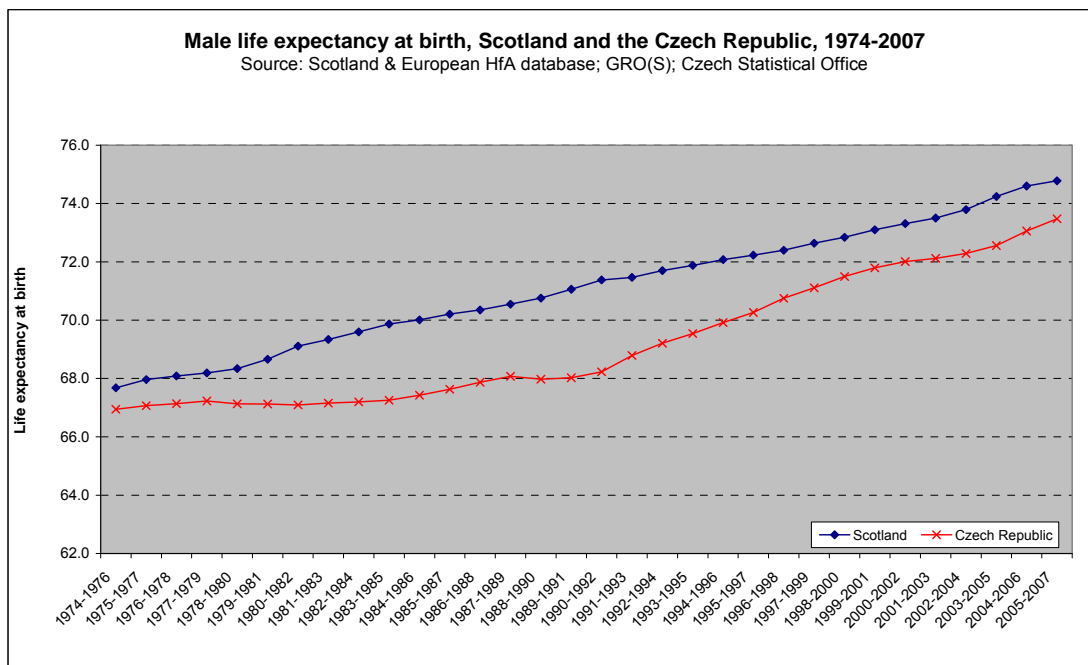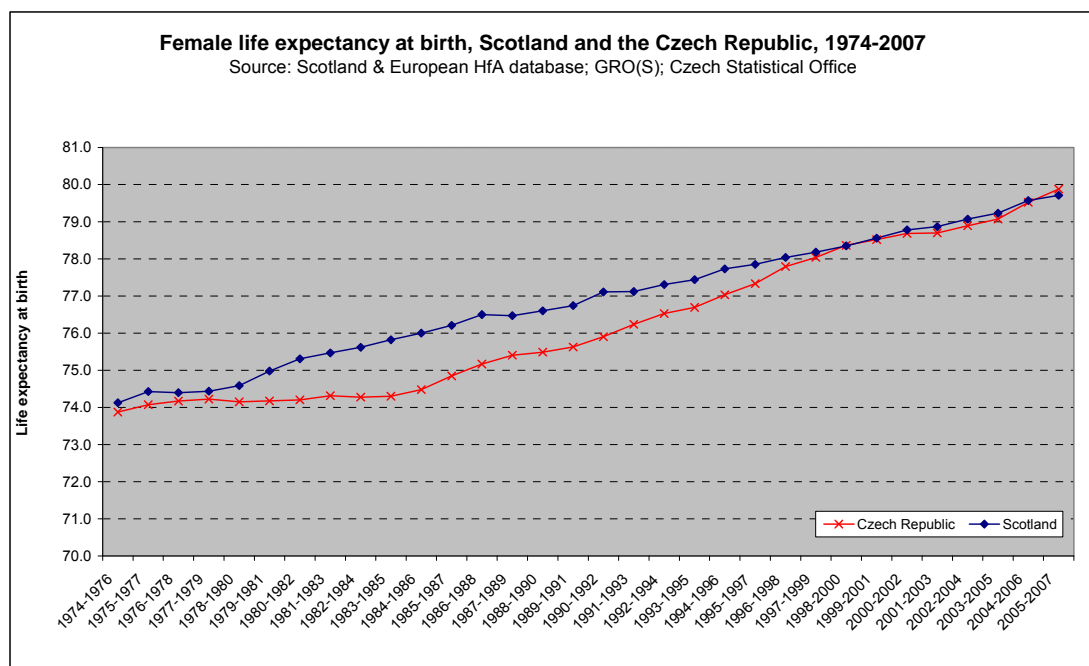
4.3 Self-rated health

Finally in this section of the case study, we compare measures of self-rated health. As discussed elsewhere in the main report, self-assessed health has been shown to be a good predictor of morbidity and mortality. At the same time, however, recorded measurements can be influenced by cultural and other contextual factors. Thus we have to be very cautious in drawing any firm conclusions from cross-country comparisons of such measures.

Here we can use two sets of survey data to compare self-assessed health among middle aged residents of major cities in WCS (Glasgow) and Northern Moravia (Havirov and Karviná in Moravskoslezský)[x]. As Figure 4.11 shows, this suggests that while there are no significant differences in the percentage of 45-69 year-olds Scottish and Czech residents who rate their health as 'poor' or 'very poor', a significantly higher percentage of Glasgow residents rate their

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[x] Czech data are taken from the HAPIEE study described in Section 3. Scottish data are from the NHS Greater Glasgow & Clyde Health & Wellbeing Survey.

health as 'good' or 'excellent'. These results were similar for both males and females (data not shown).

Figure 4.11

Self-rated health, ages 45-69, Karvina/Havirov (N. Moravia) 2002-05 and Glasgow 2008
Source: HAPIEE study; GGCHWB Survey, 2008
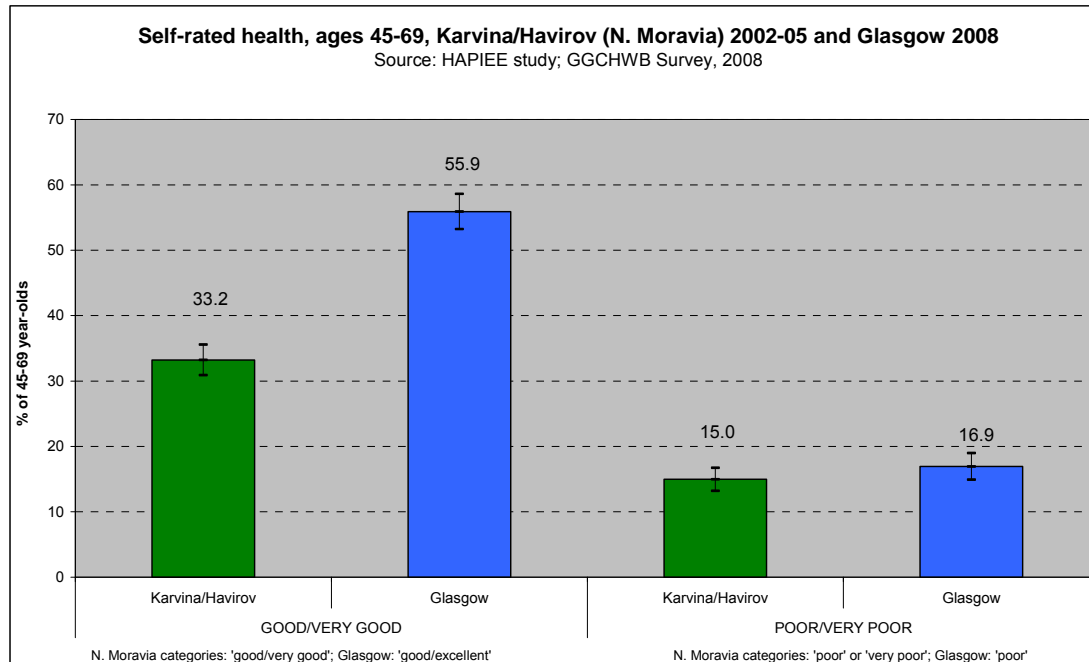
Sample sizes: Karvina/Havirov = 1,571; Glasgow = 1,304

These findings are supported by analyses of other survey data (presented in the main report) which suggest that at the regional level a higher percentage of the WCS population rate their health as 'good' or 'very good' compared to Northern Moravia (72% compared to 60%). Other survey data presented in the main report suggest that similar percentages of the population in the two regions have a **limiting long-term illness** (28% vs. 30%); however, levels of **life satisfaction** appeared to be significantly higher in WCS than in the Czech region.

Summary: Health outcomes

- Updated and more detailed comparisons of **life expectancy** trends in WCS and Northern Moravia show that:

    o The faster rate of improvement among both males and females presented in the first Aftershock report in Northern Moravia is continuing.

    o This faster rate is seen in all districts (okresy) of Northern Moravia compared to WCS. Indeed, at this district level, even the lowest recorded female life expectancy figure is higher than the equivalent figure for WCS.

    o The data suggest inequalities in male and female life expectancy may be wider, and may be increasing faster, in WCS compared to Northern Moravia. However, this conclusion must be tempered by issues relating to different sized sub-regional geographies in the two countries.

- Survey data suggest that higher numbers of middle-aged male and female Glaswegians **perceive themselves to be in good health** compared to equivalent residents of two towns in Moravskoslezský (the 'core', industrial/ex-industrial part of Northern Moravia). This clearly differs from results of more objective measurements of population health such as mortality.

5. Poverty and prosperity: perceived, absolute and relative.

As outlined above and elsewhere in this report, one of the key research aims of this second phase of work was to investigate the extent to which WCS's relatively slower rate of health improvement can be explained purely in terms of socio-economic factors. In this section of the Northern Moravian case study, we examine a number of indicators to compare measures of poverty and prosperity between the Czech region and WCS. These include: unemployment; employment; car ownership (as a proxy for income); economic activity; and worklessness. Where possible, we try and show change over time, and also analyse the data at a sub-regional level. Finally we discuss some survey-based measures of perceived and relative income.

5.1 Unemployment

Using census data from Scotland and the Czech Republic we can make fairly detailed comparisons of unemployment levels between WCS and Northern Moravia. The use of census data means analyses can only be carried out up to 2001. However, more recent unemployment data are presented later in this section; furthermore, data for earlier time periods are crucial to our understanding of long-term trends in health status.

In 2001, 14% of the economically active population of Northern Moravia were unemployed (Figure 5.1). This was almost double the figure for WCS (which itself was higher than the Scottish national figure), and was also considerably higher than the figure for the Czech Republic as a whole. Within Northern Moravia, rates were higher in Moravskoslezský than in Olomoucký.

Figure 5.1

Unemployment rates, 2001
Source: Czech Statistical Office/Scottish census data
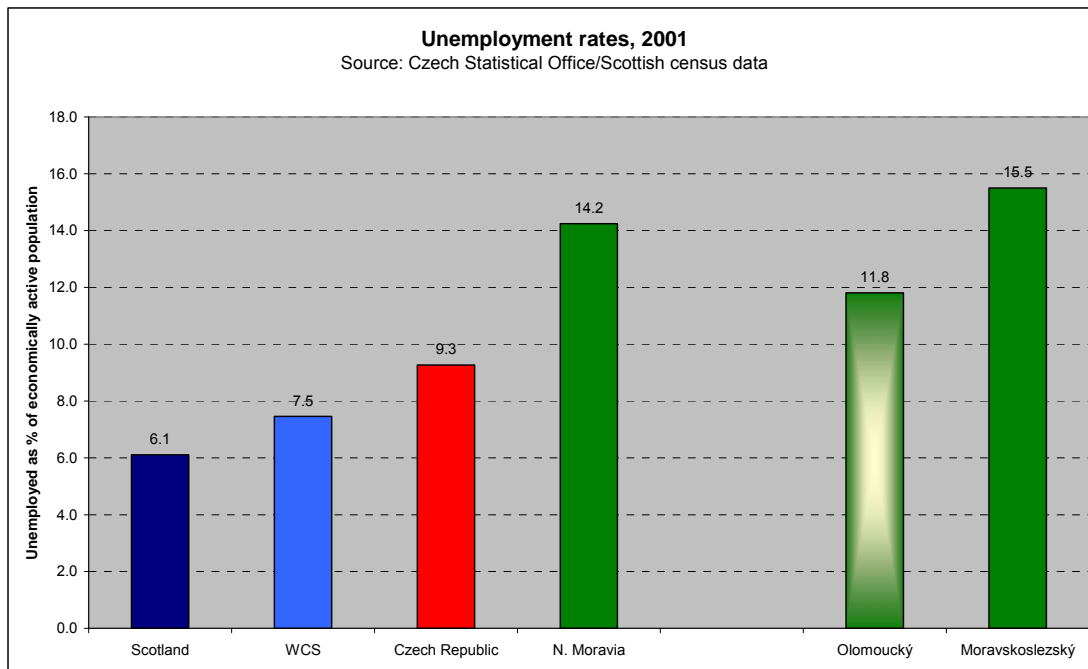
Figure 5.2 compares sub-regional estimates of unemployment in Northern Moravia (using the 11 *okresy*) and WCS (using the 15 CHP areas). As can be clearly seen, unemployment rates were higher in nearly all the Northern Moravian *okresy* compared to the WCS CHP areas. Unemployment in the 'best' Northern Moravian *okres* (Prostějov) was almost three times higher than in the 'best' WCS CHP area (East Renfrewshire). Restricting comparisons to the 'core' Moravskoslezský part of Northern Moravia shows that all six districts had higher unemployment than any CHP area, including North Glasgow (the CHP area with the highest unemployment rate in 2001).

Figure 5.2[xi]

Unemployment rates, 2001
Source: Czech Statistical Office/Scottish census data
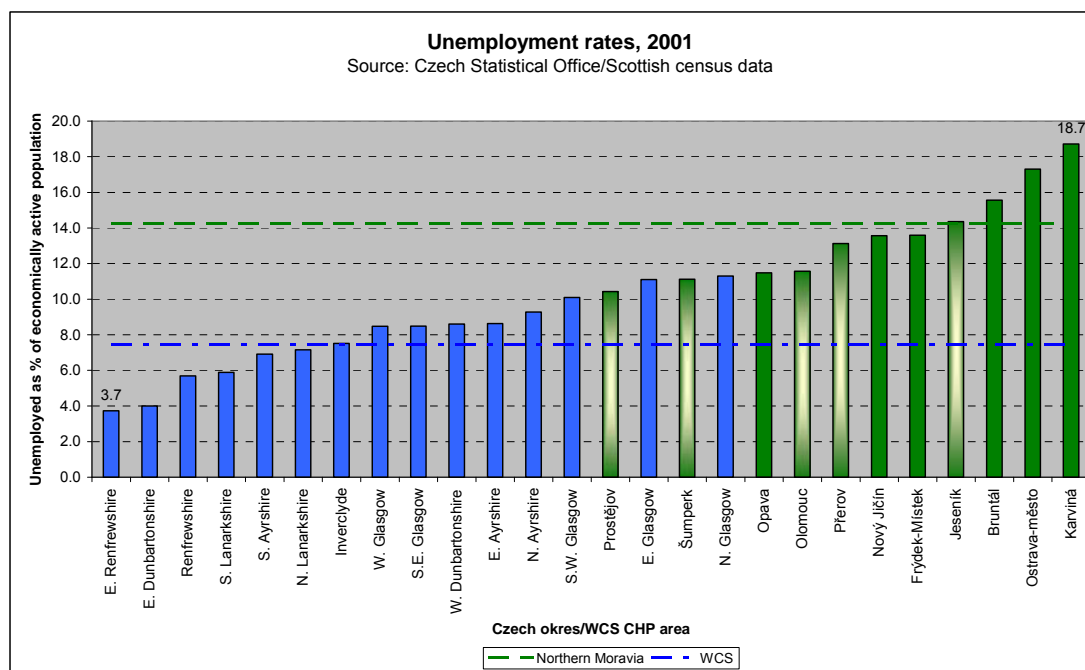
It is more difficult to show time trend comparisons in unemployment rates between the Czech and Scottish region prior to 2001. This is because of the full employment policies in place in Czechoslovakia under the Communist regime. The country's officially recorded unemployment rate at the time of the 1981 census was 0%. In 1991, two years after the collapse of Communism but prior to the establishment of the new republic in 1993, the official unemployment rate was only 2.3% (2.6% in Northern Moravia). However, unemployment increased dramatically in the mid-1990s. Figure 5.3 shows Czech data on registered job applicants (shown as a percentage of the working age population) between 1991 and 2008. All parts of the country were affected – but especially Northern Moravia (and within that, Moravskoslezský in particular). Comparable job applicant data for WCS is not available; however, we can use survey and other administrative data to compare unemployment rates between South West Scotland (as a proxy for WCS) and Northern Moravia between 1993 and 2008. These show a

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[xi] As outlined in Section 3, in this chart (and several others) Moravskoslezský districts are shown in green, with Olomoucký and its districts shown in green & yellow.

continual decline in unemployment levels in South West Scotland over the period, in sharp contrast to the trend seen in the Czech region (Figure 5.4).

Figure 5.3

Job applicants, as % of working age population, 1991-2008
Source: Czech Statistical Office

Figure 5.4

Unemployment rates, S.W. Scotland and Northern Moravia, 1993-2008
Source: Overman & Puga (2002); Eurostat; Czech Statistical Office
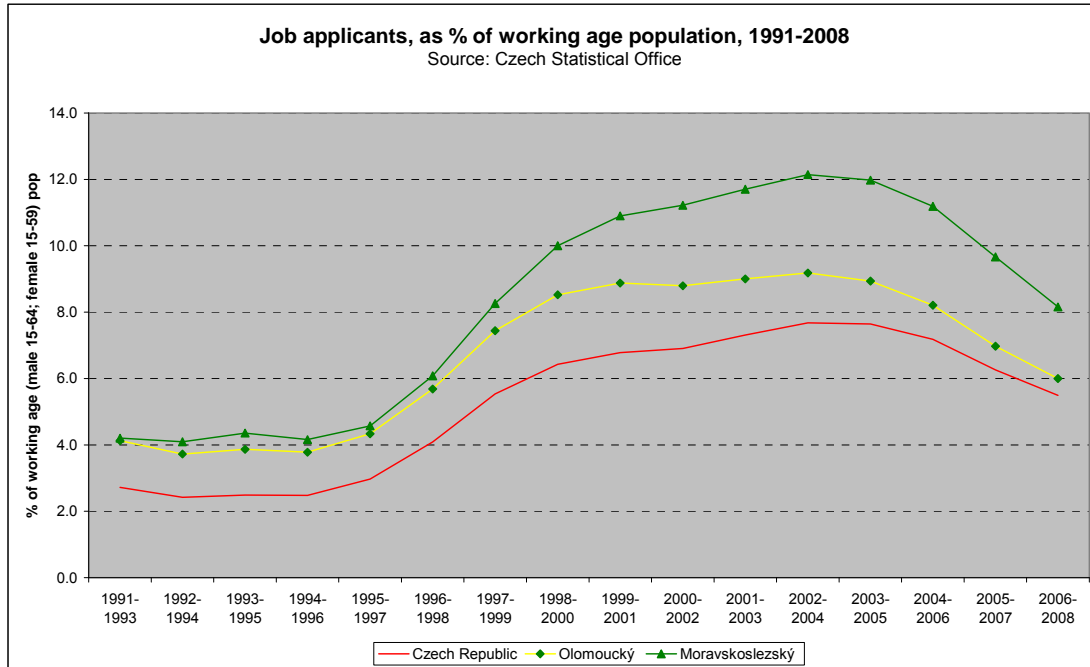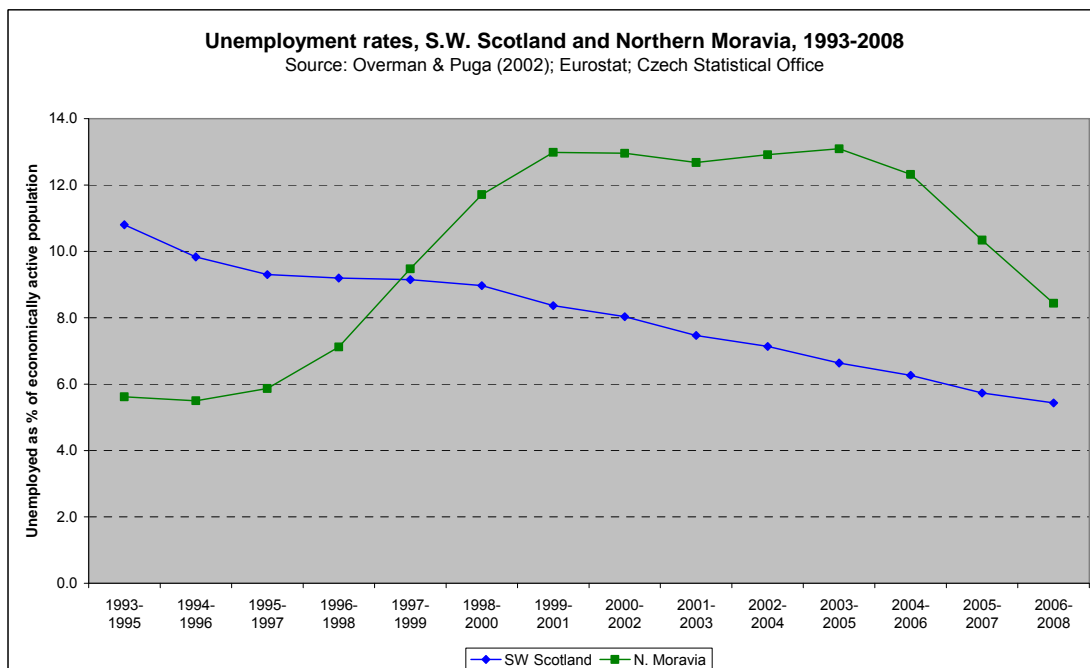
Both Figures 5.3 and 5.4 also show the considerable improvement in unemployment rates seen in the years 2005-2008. Figure 5.5 shows this change in unemployment for the Moravskoslezský *kraj* between 2005 and 2009 through comparison of thematic maps for the two years. In both maps, the darker shaded areas are the areas with highest unemployment rates. These maps show that even in 2009, following significant decreases in unemployment across the region, there are still districts in with relatively very high rates of unemployment (between 15% and more than 30%). This includes the area around Karviná in the east, one of the districts most affected by deindustrialisation[13].

Figure 5.5
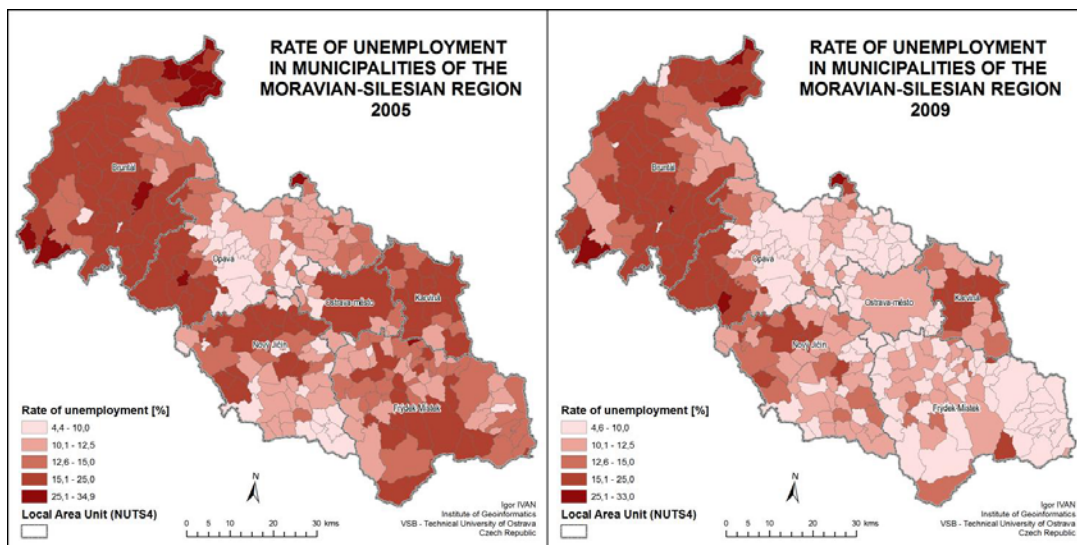
5.2 Employment

As discussed in the main report, rates of employment, rather than unemployment, are arguably more useful in shedding light on labour market activity. Figures 5.6 and 5.7 shows trends in employment rates between 1993 and 2005 for males and females respectively. The data show generally improving employment rates in WCS in contrast to a downward trend for Northern Moravia.

Figure 5.6

Male crude employment rates, West Central Scotland and N. Moravia: 1993-2005
Source: Calculated from Labour Force Survey, GRO(S) and Czech Statistical Office data

Figure 5.7

Female crude employment rates, West Central Scotland and N. Moravia: 1993-2005
Source: Calculated from Labour Force Survey, GRO(S) and Czech Statistical Office data
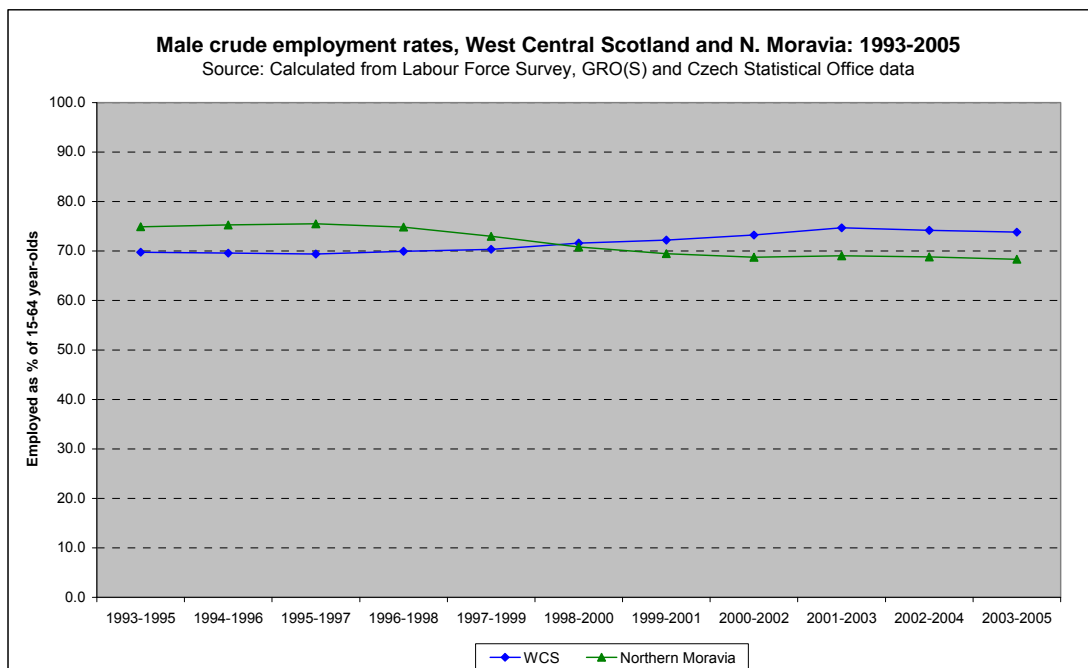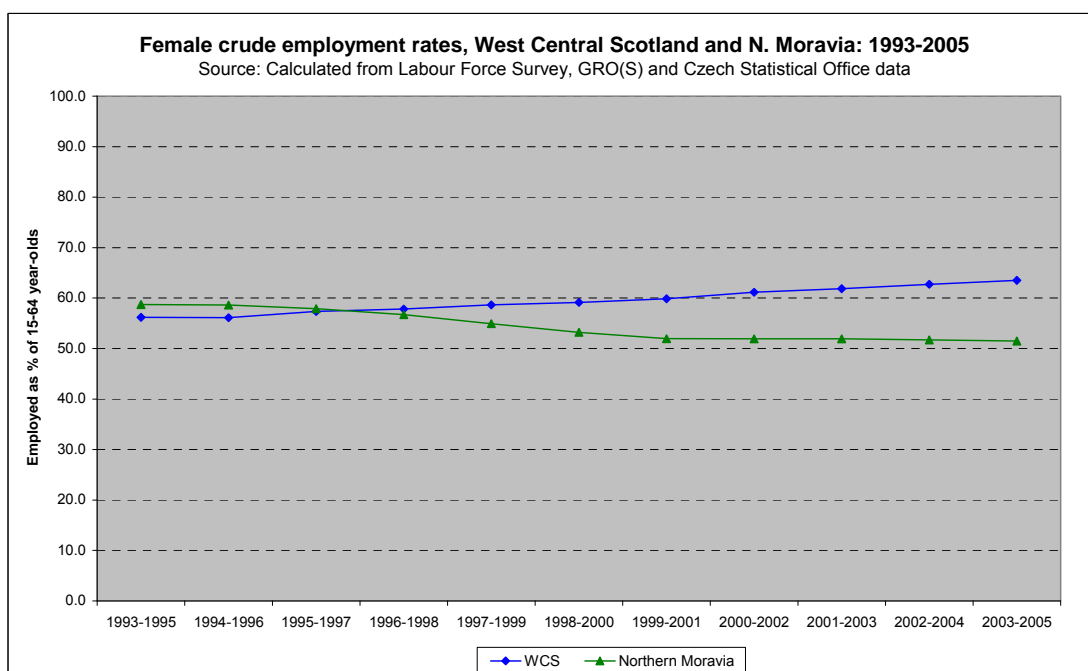
5.3 Economic activity

The 'economically active' population is broadly defined as adults who are either employed, or unemployed but seeking work[xii]. WCS, and Glasgow in particular, has long been associated with relatively high levels of economic *inactivity*. We can compare levels of economic activity in the Czech and Scottish regions over three census periods (1980/81, 1991 and 2001), and at sub-regional level.

Figure 5.8 shows trends in economic activity over this 20 year period for WCS and the Northern Moravia region's two constituent parts, Moravskoslezský and Olomoucký. In 2001 rates were generally very similar, having previously been higher in the Czech region (although this will again be influenced by employment policies in the old Communist Czech state). Rates in 2001 were slightly lower in Moravskoslezský compared to Olomoucký, but generally there was very little difference between the *okresy* across the whole region (Figure 5.9). However, comparisons with WCS sub-regional geographies (in this case CHPs) show greater variation across WCS than is the case across Northern Moravia (Figure 5.9).

[xii] Note that – and as explained in Appendix 1 – the precise definitions of economic activity in Scotland and the Czech Republic differ slightly. However, these are unlikely to impact significantly on any of the data shown.

Figure 5.8

Economically active population, 1980, 1991, 2001
Source: Czech Statistical Office; Scottish census data

Figure 5.9

Economically active population, 2001
Source: Czech Statistical Office; Scottish census data
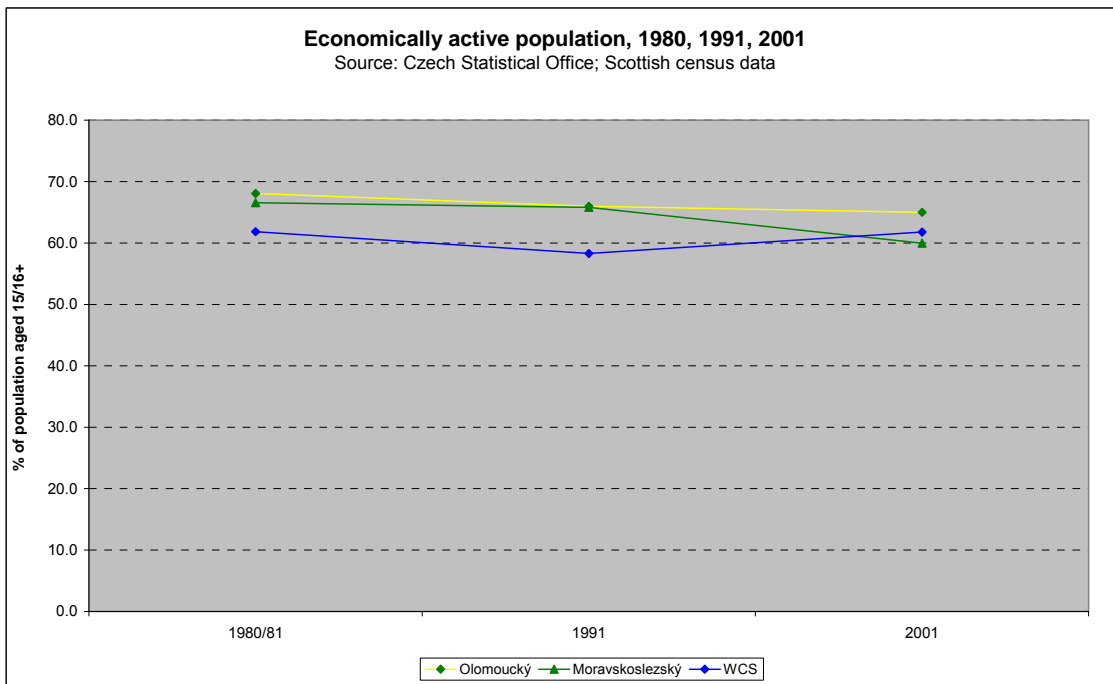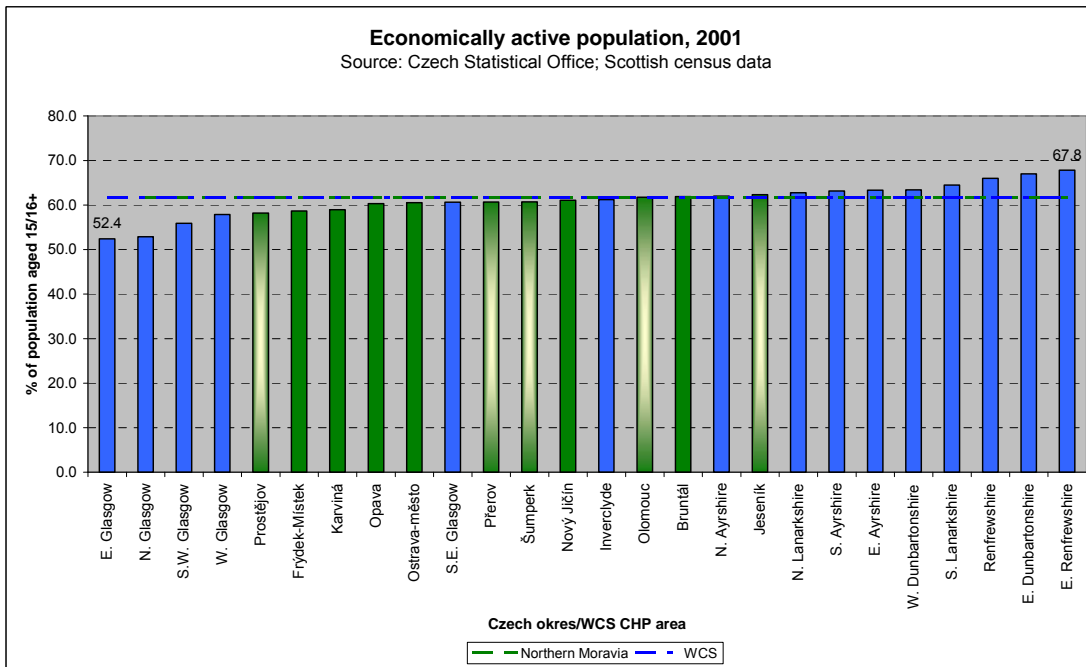
Note also that by combining the number of people classed as economically inactive with the numbers classed as unemployed, we can calculate a crude measure of worklessness. As Figure 3.28 in Section 3.3 of the main report showed, data for 25-49 year-olds in 2001 suggested that male worklessness for this age group was slightly higher in WCS (22%) compared to Northern Moravia (17%).

5.4 Car ownership

As discussed in the main report, although levels of car ownership have been shown to be a very useful proxy measure for household income with the UK, cross country comparisons of this indicator are more problematic, given differences in relative cost and affordability within different countries, as well potential cultural influences.

Bearing those caveats in mid, Figure 5.10 shows the percentage of households without access to a car in WCS and Northern Moravia between 1980-1981 and 2001. In both regions, the figures have been decreasing, but have decreased relatively more in WCS, where by 2001 the figure was almost 15 percentage points lower than that of Northern Moravia as a whole. Thus, car ownership levels are considerably higher in WCS, and Figure 5.11 shows that this is true across virtually all sub-regions (here Czech *okresy* compared to WCS local authority areas). The one exception to this is Glasgow, where the relatively low car ownership level is similar to that of a number of *okresy* (although it is still lower than in Karviná, Bruntál and Ostrava-město within the 'core' Moravskoslezský part of Northern Moravia).

Figure 5.10

Households without access to a car/van, 1980, 1991, 2001
Source: Czech Statistical Office; Scottish census data

Figure 5.11

Households without access to a car/van: 2001
WCS local authorities and Northern Moravian districts
Sources: Czech Statistical Office; GRO(S) Census of Population
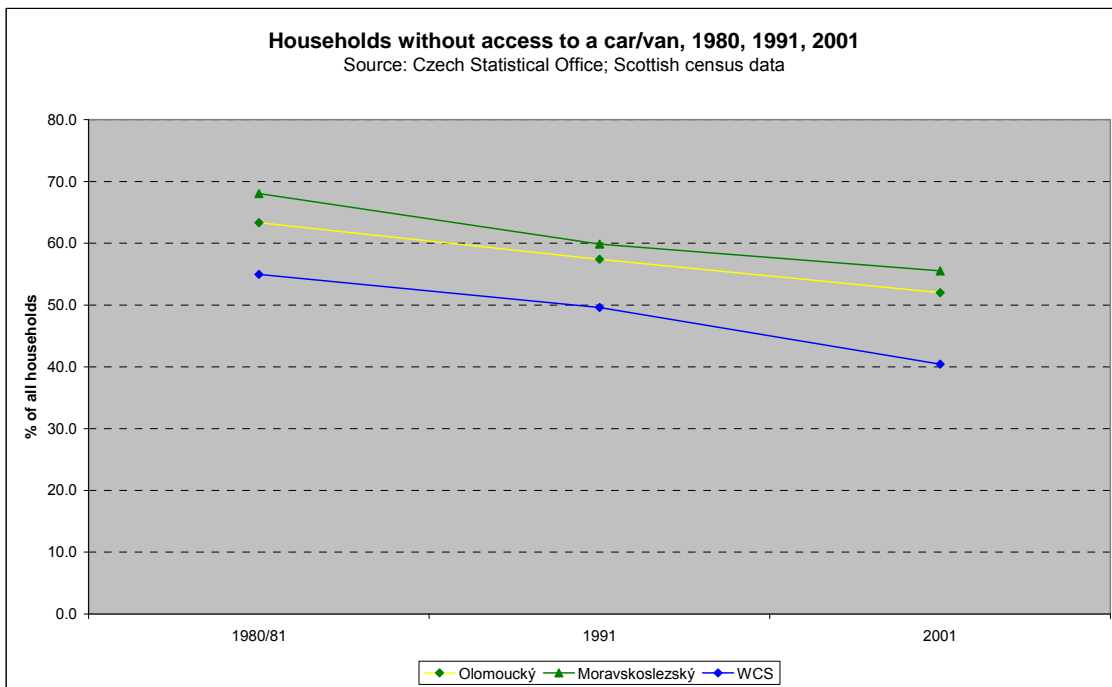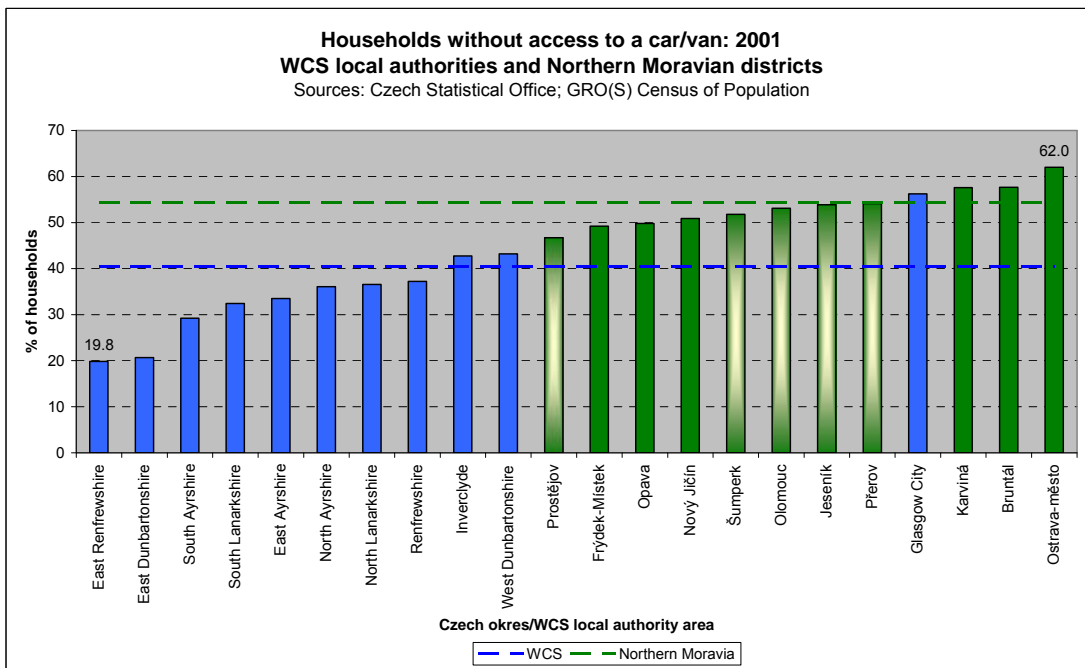
5.5 Perceived adequacy of household income

As reported in the main section of the report, survey data can be compared to assess regional differences in perceived adequacy of income at the household level. The question asked in both the European Social Survey (ESS) and the Scottish Social Attitudes Survey (SSAS) is whether people "find it difficult to manage on household income nowadays"[xiii]. Although care must be taken in comparing data from different surveys (especially where, in this case, results are based on relatively small sample sizes (between 500 and 600 in the Czech and Scottish regions)) the results suggest significant differences in perceived adequacy of income between the two regions. Eleven per cent of the WCS sample in the SSAS said they found it difficult to manage, compared to 43% of the ESS sample for Northern Moravia (Figure 5.12).

Figure 5.12

% of adults who find it difficult to manage on household income nowadays
Sources: European Social Survey Rounds 1-4; Scottish Social Attitudes Survey 2007

Sample sizes: WCS - 534; N. Moravia: 575
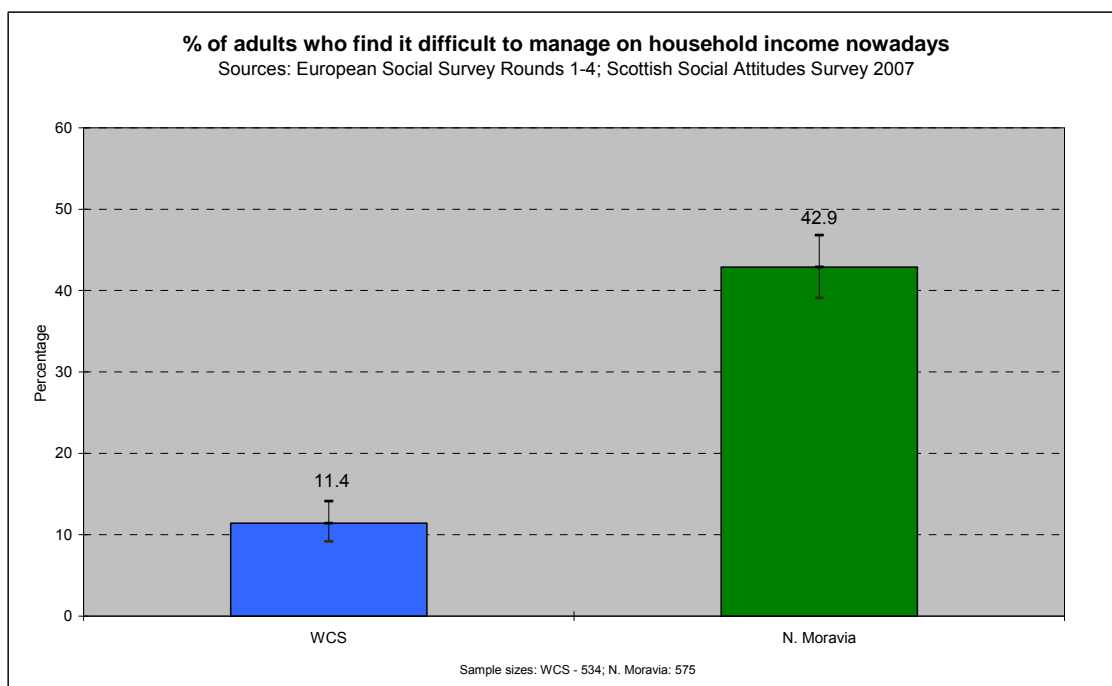
Sample sizes: WCS = 534; Northern Moravia = 575.

[xiii] 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 region 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%.

5.6 'Relative' poverty

The indicators presented thus far in this section can be summarised as 'absolute' measures of (or absolute *proxy* measures of) socio-economic status. Employment, unemployment, economic activity, car ownership, worklessness etc. are all presented as the absolute number (of individuals or households) in a population, expressed as a rate of that population. A different way of analysing these type of data is to assess how they compare *within* a population, or *relative to* the rest of the population. In other words, we can examine 'relative' measures.

Figure 5.13 presents data derived from income survey information to show the percentage of the population in Moravskoslezský and South West Scotland (used here as a proxy for WCS) whose income is less than 60% of the median value of each region. This is a commonly used definition of 'relative' poverty[xiv]. This suggests that although, in absolute terms, residents of WCS are less 'poor' than residents of Northern Moravia (i.e. they have lower unemployment, higher car ownership etc), a significantly higher percentage have a low income relative to the rest of the region. Note, however, that the data are averaged over a seven year period (1994-2001), and that relative poverty rates may well have fluctuated within that period, especially within countries such as the Czech Republic which have experienced considerable political change.

[xiv] Guy Palmer. *The Poverty Site.* See http://www.poverty.org.uk/summary/eapn.shtml for more detailed discussion of choice of income threshold for measuring relative poverty

Figure 5.13

% of population living in relative poverty (below 60% of median income), 1994-2001
Source: Lemmi et al (2003) based on ECHP; GCPH calculations
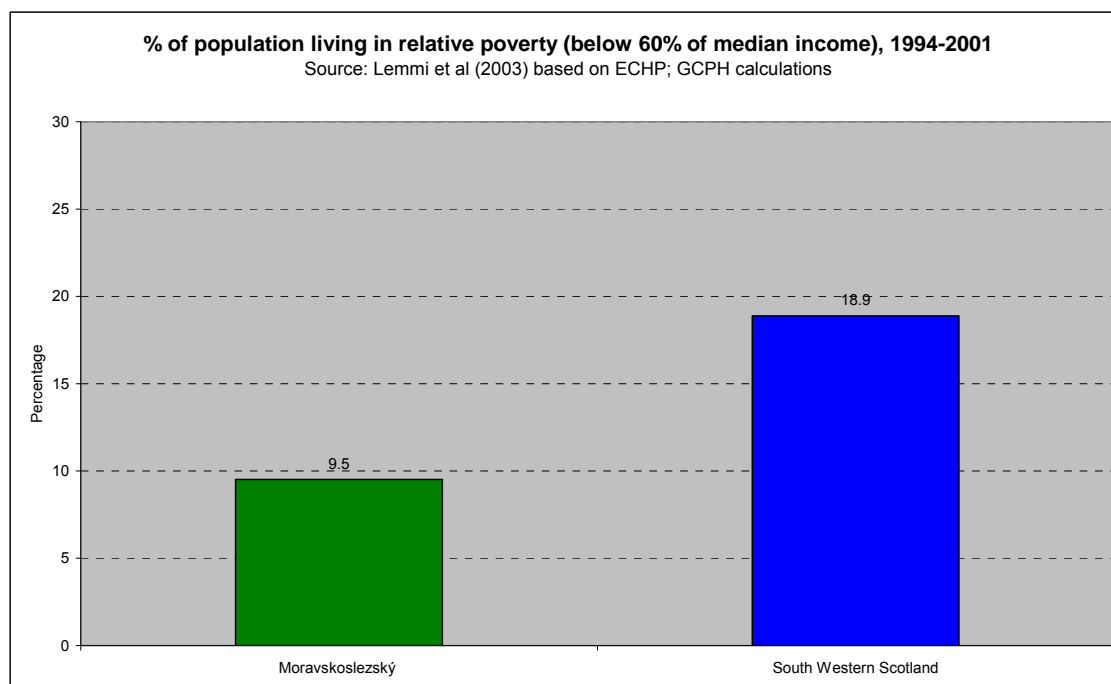
Sample size for SWC = 1,279; sample size for Moravskoslezský not available.

5.7 Income inequality

Figure 5.13 above obviously implies that inequalities in income in WCS may be greater than in Northern Moravia. A more in-depth analysis of a specific measure of income inequality – the Gini coefficient – was presented in section 3.4 of the main report.

This showed that income inequalities are significantly higher in Scotland (and, indeed, the UK[xv]) than in the Czech Republic: in 2004 the Gini coefficient for Scotland was 0.32, while that of the Czech Republic was 0.27. The trend for both countries is upward.

[xv] As discussed in the main report, for comparisons of income inequality measures such as the Gini coefficient, both Scottish and UK data are relevant.

Comparisons at the regional level are more problematic for a number of reasons discussed in the main report. However, regional estimates for around the same period also show greater inequalities in WCS compared to Moravskoslezský[xvi], although not significantly so.

[xvi] Gini coefficient data for 2004 for all of Northern Moravia were not available.

Summary: Poverty and prosperity

The data presented in this section of the case study generally support the suggestion made in the first *Aftershock* report that the socio-economic profile of WCS is superior to that of Northern Moravia. This is seen in:

- Lower rates of **unemployment** and higher rates of **employment** at regional and sub-regional level
- Higher levels of **car ownership**
- Higher levels of **perceived adequacy of income**

In addition, levels of economic activity are very similar in WCS compared to Northern Moravia.

However, data also suggest that although WCS may be less disadvantaged in terms of these absolute measures, **'relative poverty'** and the associated measure of income inequality may be greater in WCS. This may be an important finding in relation to understanding the reasons behind the poorer health status of residents of WCS compared to this former Communist region of the Czech Republic.

6. Population: births, deaths, composition and migration

In this section we briefly discuss data relating to the overall structure of the populations of the two regions.

6.1 Births

Figure 6.1 below shows that the fertility rate (live births per 100 females aged 15-44) in Northern Moravia, while previously higher than that of WCS, is now lower due to the considerable decrease that took place in the 1990s following the end of Communism. This decline has been attributed to a societal change in family planning attitudes that occurred in this period, with births becoming fewer, and being postponed until later[14]. This also coincided with greater availability of reliable birth control, which has been suggested as a plausible reason for a similar decline in terminations of pregnancy that has taken place since the 1990s (as discussed later in this case study).

Figure 6.1
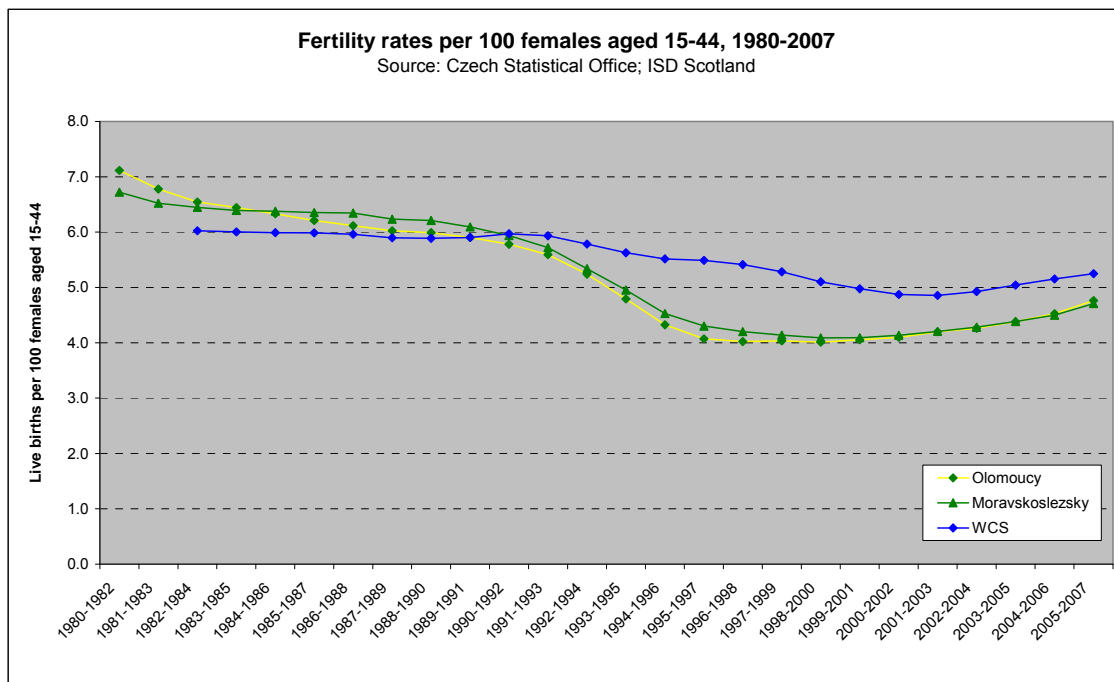
Current fertility rates do not differ greatly across the *okresy*: rates are lower in each compared to WCS (data not shown). Note also that a number of other birth related indicators (including terminations of pregnancy) are presented in Section 10 (Child & Maternal Health).

6.2 Deaths

Detailed analyses of mortality rates have already been discussed, and were presented in the first *Aftershock* report. However, with relevance to a population perspective, Figure 6.2 compares trends in actual number of deaths and births in both regions. This shows a similar pattern in both regions in terms of higher numbers of deaths than births in the period from the mid 1990s to mid 2000s, but – and as already shown in Figure 6.1 above – an increase in births in more recent years. Clearly, trends in numbers of births and deaths impact on population change, and this is discussed in more detail below.

Figure 6.2

Births and deaths, West Central Scotland, 1982-2007
Source: GRO(S)

Births and deaths, Northern Moravia, 1982-2007
Source: Czech Statistical Office
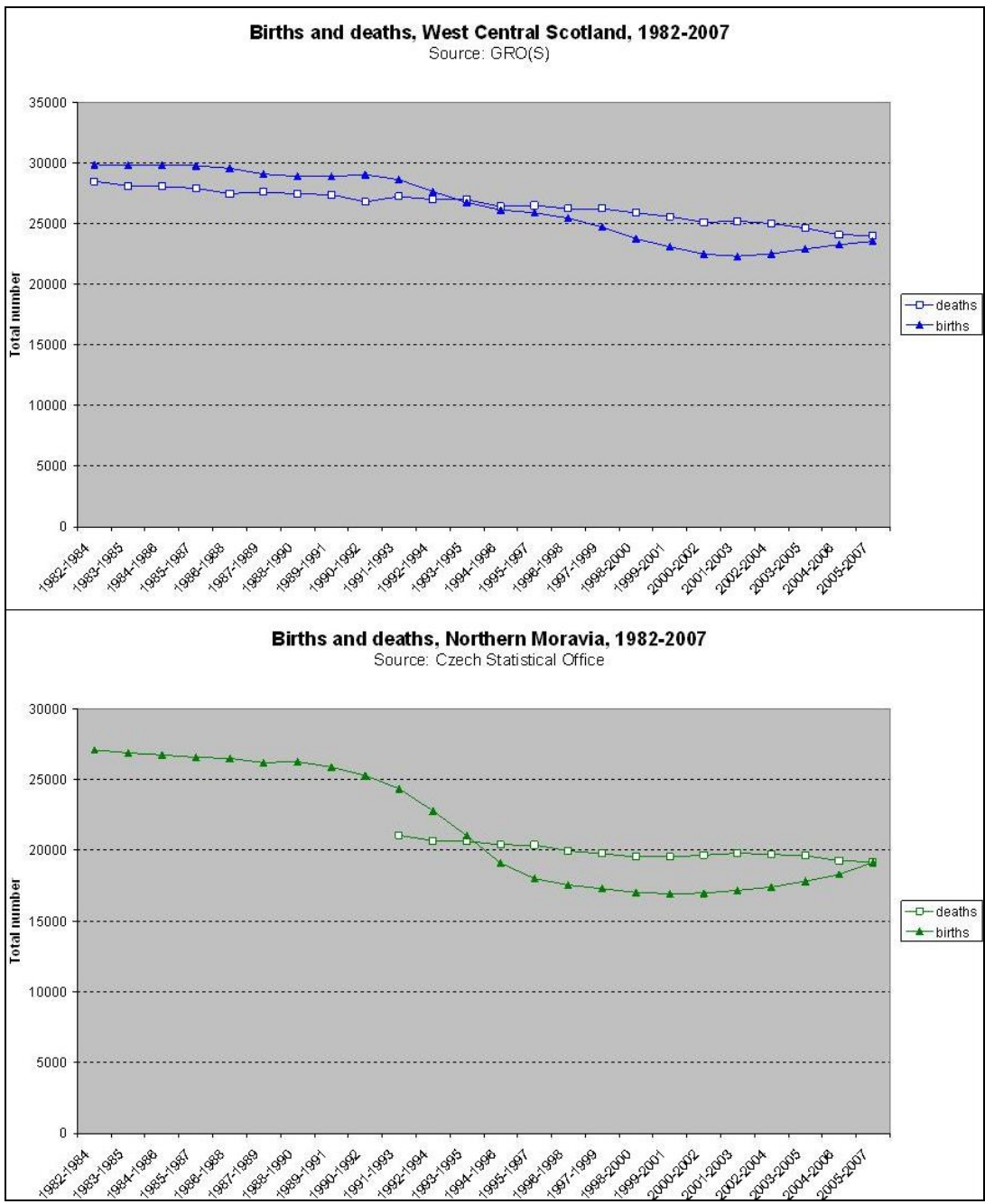
6.3 Migration

As discussed in the main sections of the report, population change can have a potentially important influence on population health. Selective migration (e.g. in relation to the so-called 'healthy migrant' effect) has been shown to impact on levels of spatial health inequalities[15, 16, 17, 18, 19, 20], although the scale at which this operates, and the extent of its impact, has been the focus for much debate[21, 22]. However, a number of recent studies – including some focusing specifically within Scotland [23,24,25,26] – have suggested that migration is unlikely to impact on health inequalities at the *regional* level: rather, it is at a small area level that the greatest impact is likely to be seen.

Nonetheless it is of interest to know whether, and to what extent, the population sizes and structures of the regions have been changing. Figure 6.3 shows simple trends in population size for both the whole population (Figure 6.3(a)), and for different age groups (Figures 6.3(b) to 6.3(e)). These show the following:

- There has been a more notable decrease in the total population size of WCS (-8%) over the 25-30 year period than has been the case in Northern Moravia (-1%).
- While the numbers of children (aged 0-14) have fallen in both regions, this decrease has been much more pronounced in the Czech region.
- Contrasting trends are apparent for the working-age populations: among younger working-ages (15-44) the WCS population has fallen by 11.5% (equating to a loss of almost 115,000 individuals), while in Northern Moravia it has shown little change; however, there has been a considerably higher increase in the numbers of the older working-age group (45-64) in Northern Moravia: a 30% increase, compared to 6% increase in WCS.
- As expected, the 25 year analysis period has seen an increase in numbers of the elderly (65+) in both regions; however, the increase has been proportionally greater in Northern Moravia than in WCS.

Although the extent to which the overall population sizes of the regions have changed in recent decades has not been especially dramatic, for some age groups notable contrasting patterns are evident. Despite that, as Figure 6.4 and 6.5 show, the relative age composition of the regions' populations have remained broadly similar. Furthermore, the extent to which any population changes might impact on population health levels are unclear: detailed analyses of specific regional cohorts over many years would be required to answer such a question, and such cohorts do not currently exist. However, given the research evidence concerning the size of areas at which any effects might be apparent, it seems unlikely that migration plays an important role in the differing rates of health improvement seen in the two regions.

Figure 6.3

Population trends 1980-2007, N. Moravia & WCS
Total population & selected age groups
Source: Czech Statistical Office; GRO(S)

Figure 6.4

Population age breakdown, N Moravia & WCS, 1982
Source: Czech Statistical Office/GRO(S)

Figure 6.5

Population age breakdown, N Moravia & WCS, 2007
Source: Czech Statistical Office/GRO(S)
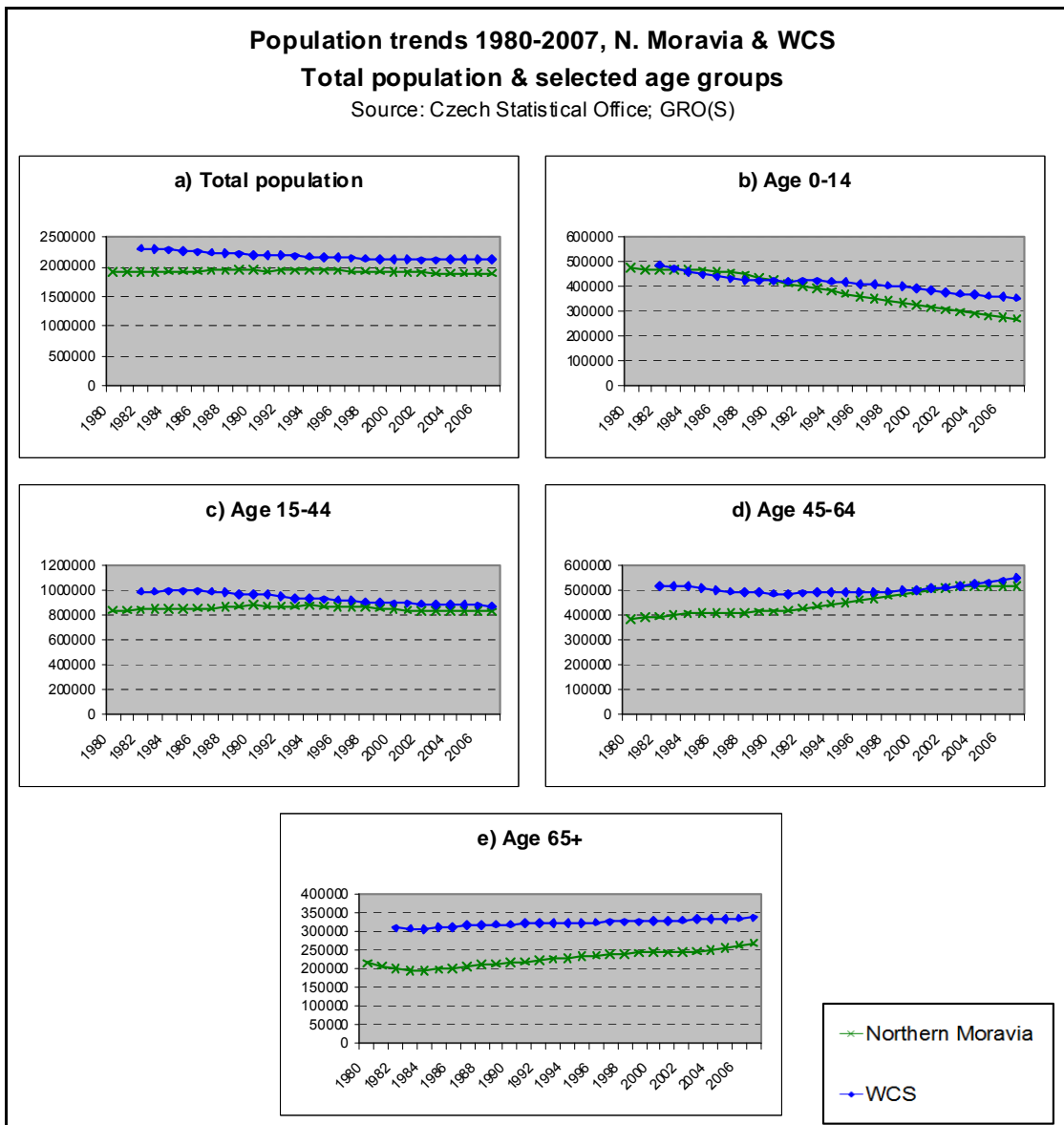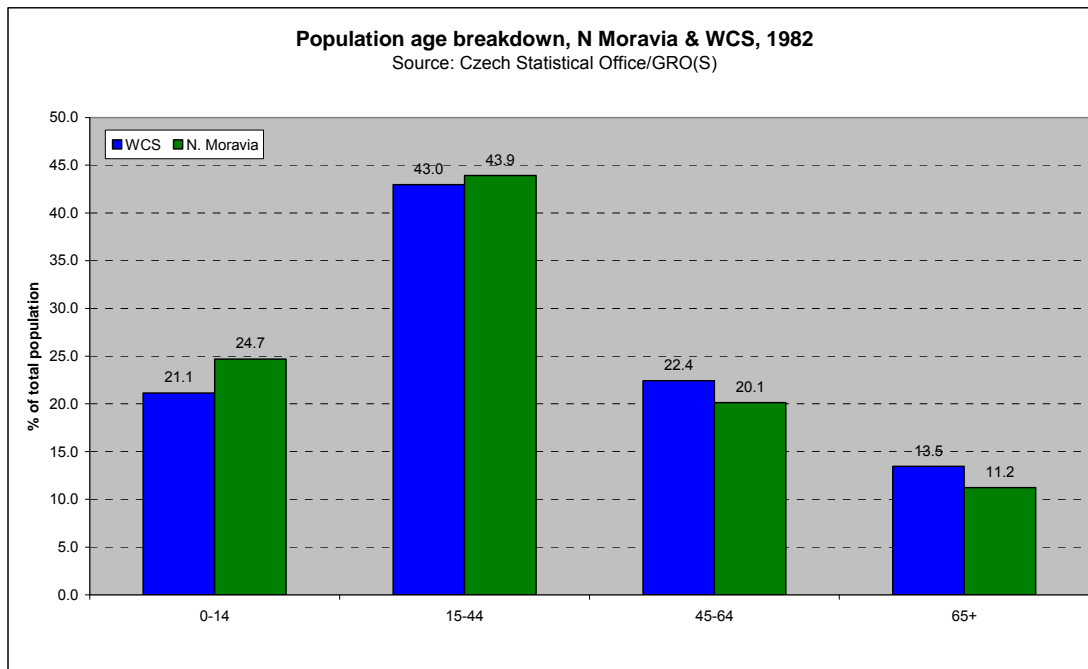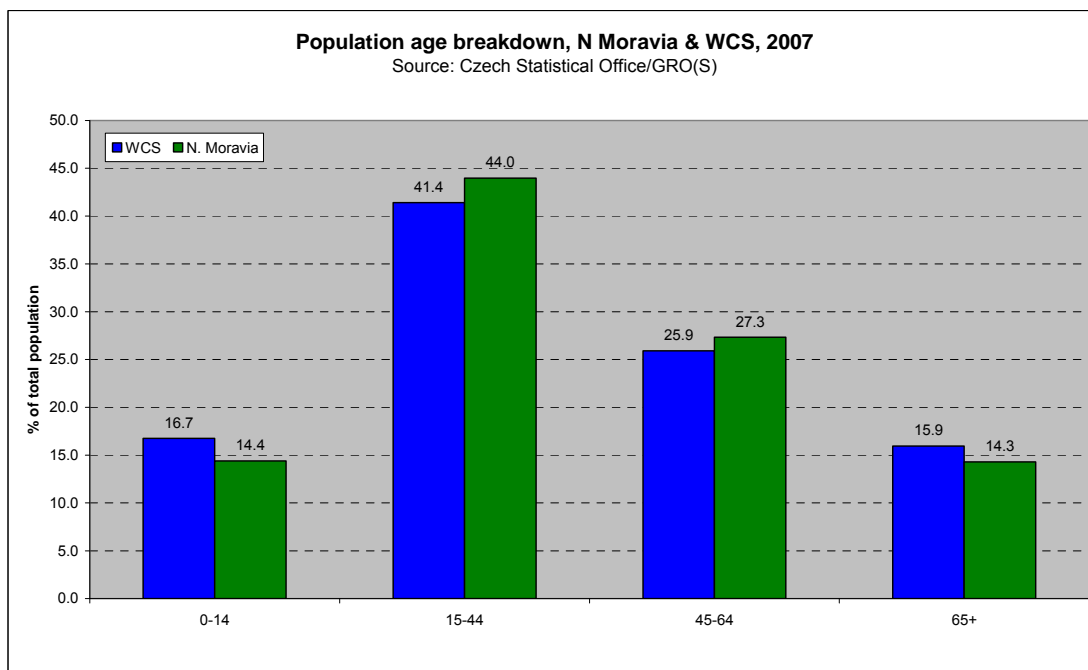
6.4 Dependency ratio

The 'dependency ratio' (defined crudely as the ratio of the 'economically dependent' population (i.e. the young and old[xvii]) to the working-age population) is an important demographic indicator for countries, regions and cities. As presented in the main section of the report (and also below in Figure 6.6), the dependency ratio in Northern Moravia (40%) is much lower than in WCS (49%). This reflects to a degree the considerable decrease in the number of children in Northern Moravia presented above.

Figure 6.6
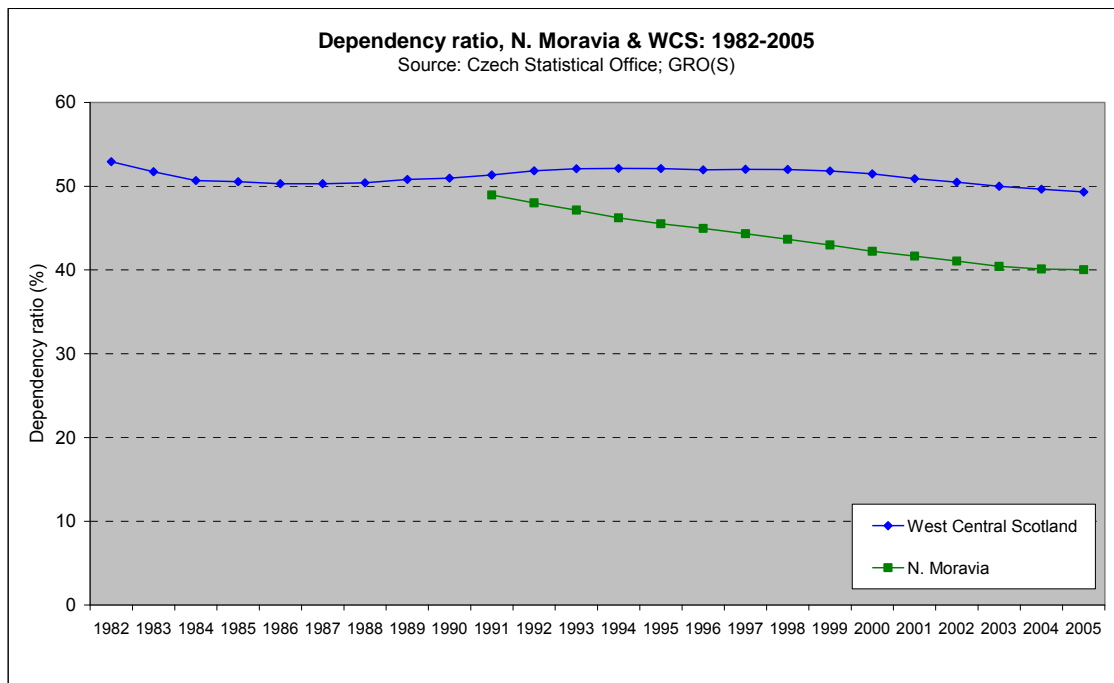
[xvii] The dependency ratio here is calculated as the total population aged under 15 and 65+ divided by the total population aged 15-64 (and divided by 100).

6.5 Population density

Comparative data on population density are useful in assessing the similarity of the regions. Figure 6.7 presents the population density across the *okresy* and the overall levels in Northern Moravia and WCS, while Figure 6.8 presents these same data compared to Scottish local authority levels. These show that while the Karviná and Ostrava-mesto districts (which include the actual towns of Karviná and Ostrava respectively) have greater numbers of people per km^2, these levels are considerably lower than that of Glasgow. However, this will also reflect the fact that the boundaries of Glasgow contain an entirely urban population, whereas the boundaries of Karviná and Ostrava-mesto include both urban and rural areas.

Figure 6.7

Figure 6.8

Population density (persons per km², 2007)
Source: Czech Statistical Office; GRO(S)
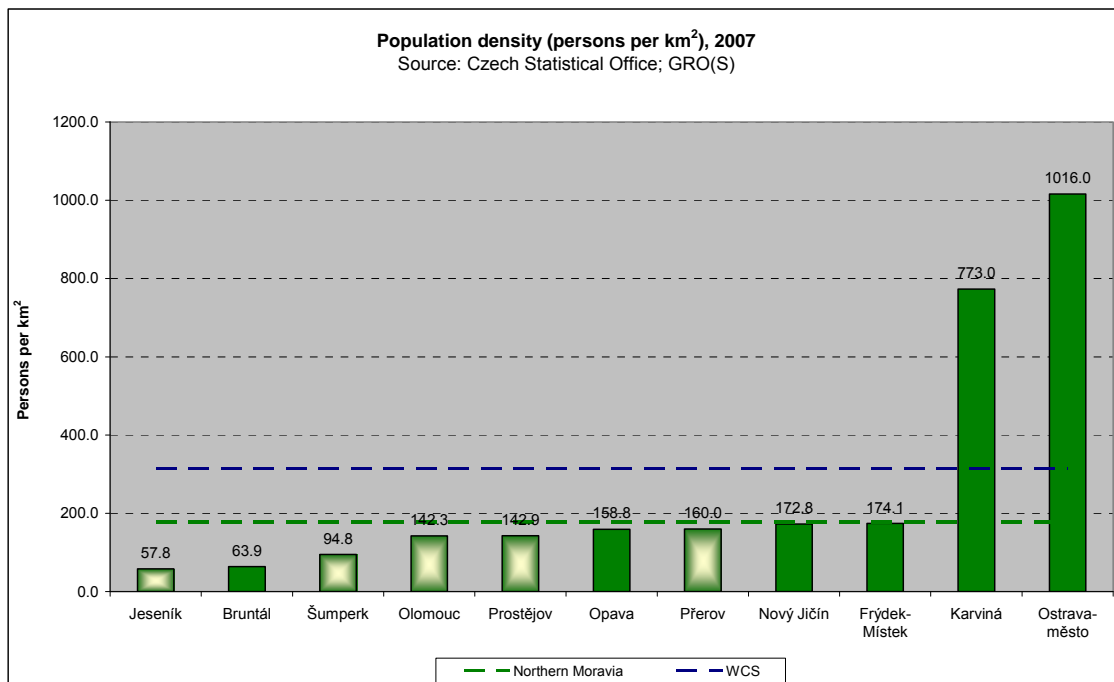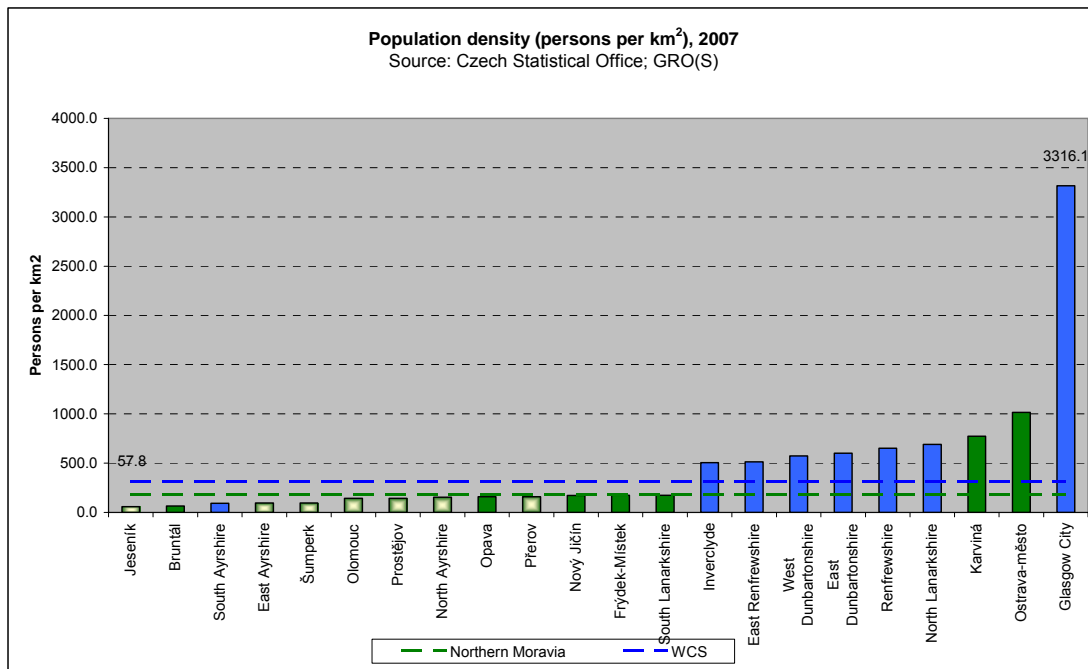
6.6 Ethnic mix

Comparable data on ethnicity for WCS and Northern Moravia are not available. Data from the Scottish 2001 census show that WCS was slightly more diverse than the overall national profile (2.4% of the population being classed as being of ethnic minority status, compared to 2% for the country as a whole). However, it is likely that this figure will have changed since 2001. Czech census data from the same year includes only nationality, rather than ethnicity: in Northern Moravia 87% classed themselves as Czech, 3.4% as Slovak, 2.3% as Moravian, and 3.1% as Polish.

Summary: Population

This brief section has highlighted a number of potentially important population-related differences between the Czech and Scottish region. For example:

- Northern Moravia's **fertility rate** has fallen considerably since the end of Communist rule and is now lower than that of WCS.

- Since the early 1980s the total **population** size of WCS has fallen by around 8%. However, in Northern Moravia it has remained relatively static. Other contrasting population changes are evident for particular age groups:

    o the decrease over time in the number of children in the population has been much more pronounced in the Czech region

    o the number of the population in the 15-44 age group in WCS population has fallen by 11.5%; in Northern Moravia it has shown little change

    o the 45-64 age group has seen a 30% increase in Northern Moravia, compared to an increase of just 7% in WCS

    o the increase in the numbers of the elderly (65+) has been proportionally greater in Northern Moravia than in WCS.

- WCS's population **dependency ratio** is higher than that of Northern Moravia.

7. The 'Social environment': Education, households and social capital

The term 'social environment' covers an array of important, often overlapping, topics which are relevant to health. These include: educational attainment, home circumstances, social capital and many more. In this section we compare a number of such indicators to assess how WCS compares with Northern Moravia in these terms.

7.1 Educational attainment

Educational attainment has been shown to be an important determinant of adult health status.[27, 28, 29, 30, 31] Previous research has suggested that in international terms WCS compares *well* in terms of higher educational qualifications, but compares *poorly* in terms of the relatively high percentage of its population who have no educational qualifications at all.[32] Regional level analyses presented in the main sections of the report confirm that this apparent disparity holds true for WCS in relation to Northern Moravia. Here we analyse these data in greater detail, examining time trends and sub-regional information.

Figure 7.1 presents a combination of Czech and Scottish survey data to show the percentage of the population of Northern Moravia (1980-2001) and Strathclyde (1990-1999) (the latter used as a proxy for WCS) who have no educational qualifications[xviii]. In both regions (and within Northern Moravia, in both Moravskoslezský and Olomoucký) the figures have decreased significantly over time. However, the figure for the Scottish area remains higher.

[xviii] Note that Labour Force Survey data are used here, rather than Scottish Census data, because educational qualifications data were not collected in the 1991 census, and thus trends cannot be shown. However, census data for 2001 are presented in Figure 7.2

Figure 7.1
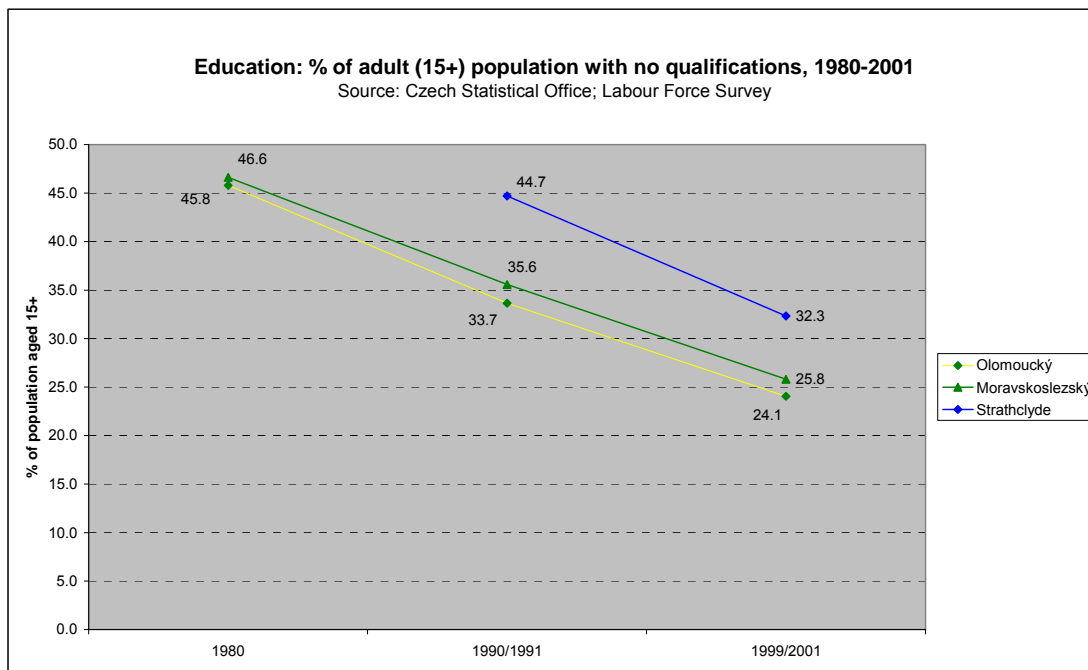
Figure 7.2 presents similar data for 2001 from the Scottish and Czech censuses, broken down by Czech *okres* and WCS local authority area. This shows that almost every Scottish area has a higher percentage of its population who have no educational qualifications compared to the comparably sized Czech districts.

Figure 7.2

Percentage of adults with no qualifications: 2001
WCS local authorities and Northern Moravian districts
Sources: Czech Statistical Office; Census
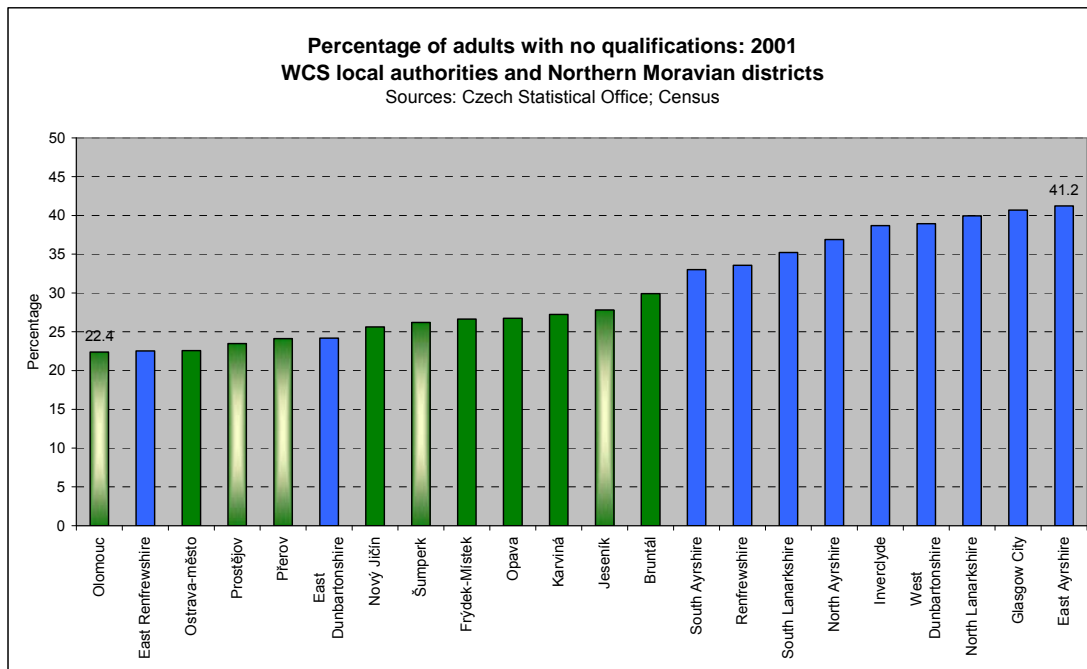
In contrast to the relative poor standing of WCS in relation to a lack of educational qualifications, Figures 7.3 and 7.4 present similar information but this time in relation to tertiary level qualifications. Figure 7.3 suggests that although the percentage with such qualifications have increased in the Czech Region in recent times (as has been the case in the vast majority of European countries[33]), the equivalent rise in WCS has been much more dramatic: the figures doubled over a ten year period.

Figure 7.3

Education: % of adult (15+) population with tertiary level qualifications, 1980-2001
Source: Czech Statistical Office; Labour Force Survey

The Czech figures for 2001 and similar Scottish data for 2004 are presented in more detail in Figure 7.4, broken down by Czech district and WCS local authority. As with the data on 'no qualifications', the higher rates in WCS are region-wide: every local authority area has higher recorded levels of completed tertiary education among its population than the similar Czech *okresy*. Indeed, the figure for the WCS local authority with the *lowest* level for this indicator (East Ayrshire: 21.2% of adults) is almost twice that of the Northern Moravian district with the *highest* figure (Olomouc: 11.4%). The Scottish figures are obviously particularly high in the relatively more affluent local authority areas of East Dunbartonshire (42.2%) and East Renfrewshire (42.8%).

Note, however, that the data presented in Figure 7.4 are based on slightly different age groups in the two regions which will slightly inflate the Scottish figures (further details are available in Appendix 1).

Figure 7.4

Percentage of adults with tertiary level qualifications: 2001-04
West Central Scotland local authorities and Northern Moravian districts
Sources: Czech Statistical Office 2001; Annual Population Survey Jan-Dec 2004
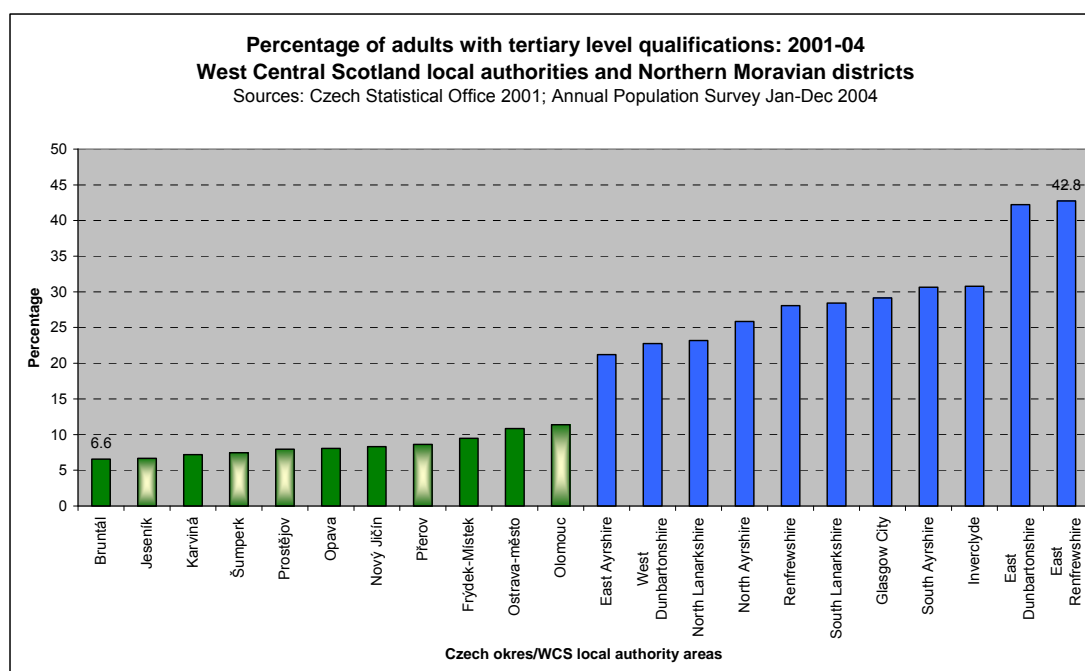
Note: Adults aged 15+ in Northern Moravia and aged 16-64 in WCS. The percentage of WCS adults aged 16+ with tertiary level qualifications is likely to be a few percentage points lower.

International comparisons of educational data sets are clearly complicated by different educational and qualification systems in place in different countries. However, the categories of educational attainment presented in the above figures are reasonably comparable (further details and definitions are included in Appendix 1); furthermore, different (and more directly comparable) data from the EU Labour Force Survey for SWC (as a proxy for WCS) and Moravskoslezský show a very similar higher level of tertiary qualifications in the Scottish population: the figure for the Scottish area is around two and a half times higher than that of the Czech area (see Figure 3.52 in Section 3.6 of the main report). In contrast, however, comparison of a similar measure of educational status among 46-69 year-olds in the two regions (i.e. based on comparisons of the HAPIEE cohort in Havirov and Karviná with census data for identically aged residents of Glasgow) does not show any significant difference between the groups (Figure 7.5).

This suggests that the higher level of tertiary level educational attainment in WCS principally relates to the younger population (and the dramatic increase in numbers in the most recent time period would appear to support this suggestion).

Figure 7.5

Educational attainment: 45-69 year-olds with university level education, Karvina/Havirov (N. Moravia) 2002-05 and Glasgow 2001
Source: HAPIEE study; Scottish census data
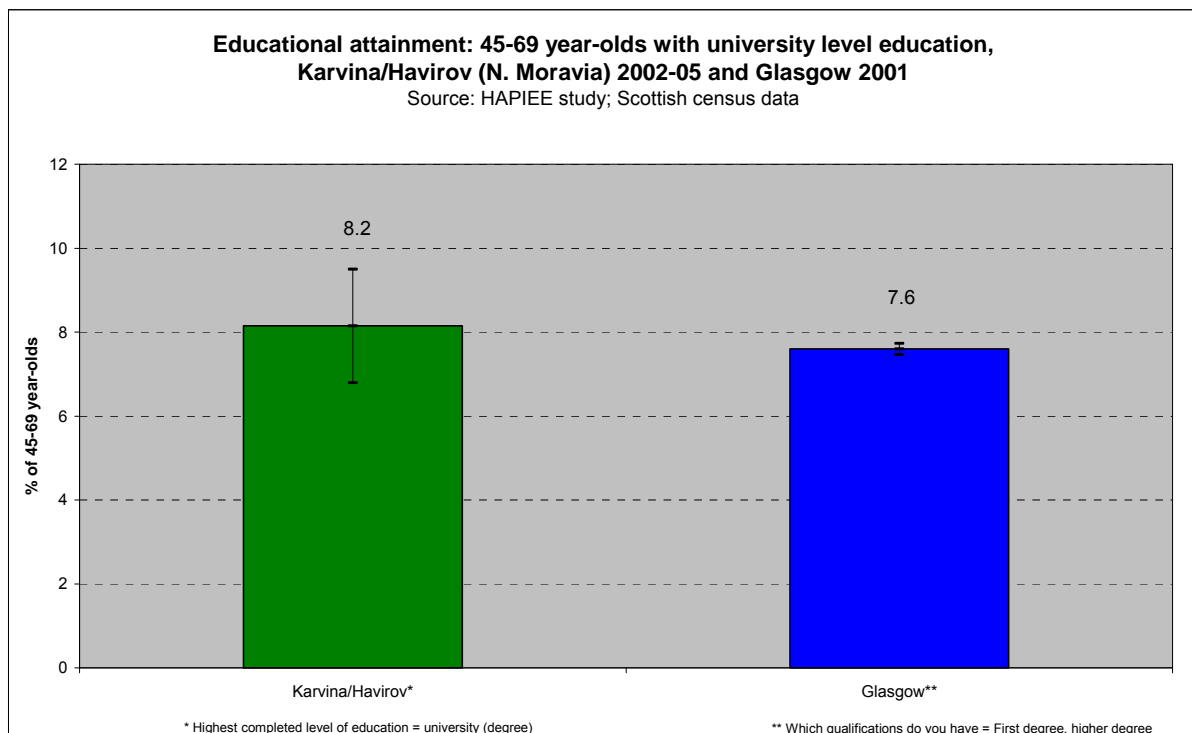
Sample sizes: Karvina/Havirov = 1,571; Glasgow: all persons aged 45-69 in 2001 (n = 147,819)

7.2 Lone parent households

WCS has significantly higher numbers of lone parent households than Northern Moravia. In 2001, over a quarter (28.5%) of households with children in WCS were headed by a single parent. This represented more than a 50% increase on 1991 levels. Rates have also been increasing in Northern Moravia and its constituent parts: however, the equivalent 2001 figure of around 22% (23% in Moravskoslezský) is still lower than that of WCS. These data are shown in Figure 7.6. Note that there are some differences in the precise manner in which this indicator is defined in Scotland and the Czech Republic. This is unlikely to significantly alter the differences between the

regions, although it may slightly overestimate the figure for Northern Moravia compared to WCS – full details are included in Appendix 1.

Figure 7.6

Lone parent households with dependent children 1991 and 2001
Source: Czech Statistical Office; Scottish census data
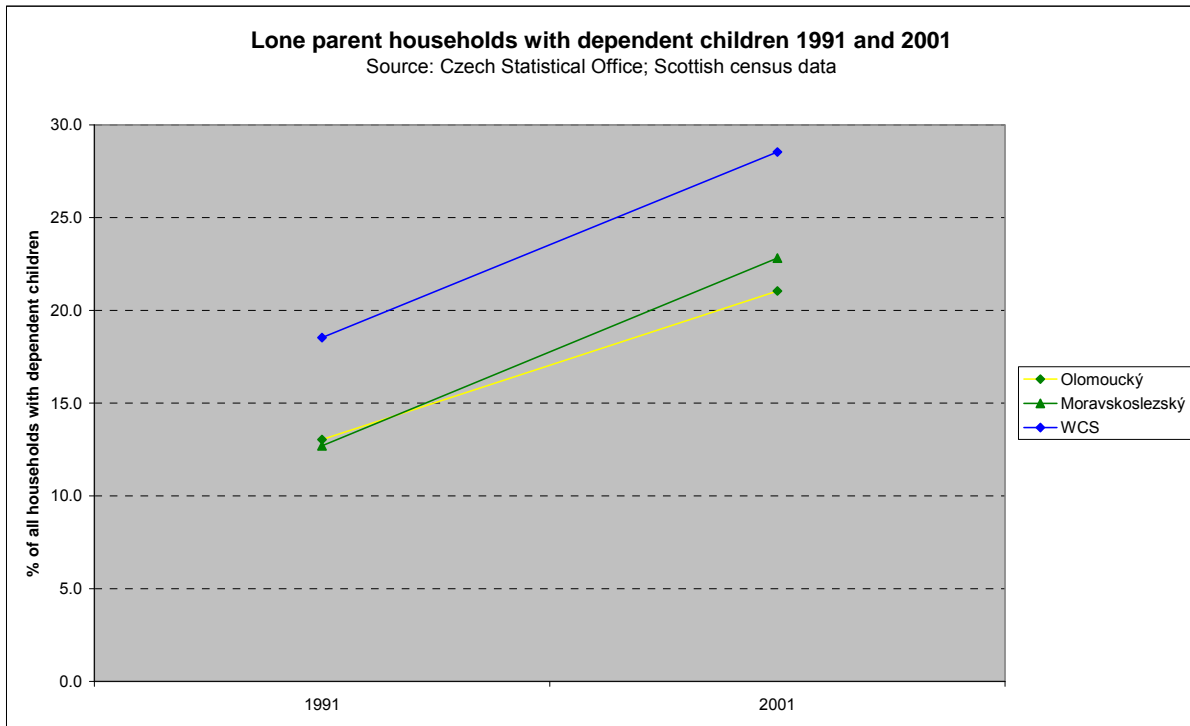
Figure 7.7 – a comparison of the same 2001 data across the Czech *okresy* and the Scottish CHP areas – shows that the rates are generally higher in the WCS CHP areas, particularly within Glasgow. However, this Figure also shows that WCS includes both the areas with the lowest figures (East Dunbartonshire: 15%; East Renfrewshire: 15.8%), and the highest (East Glasgow: 42.4%; North Glasgow: 43.9%).

Figure 7.7

Lone parent households with dependent children, 2001
Source: Czech Statistical Office; Scottish census data
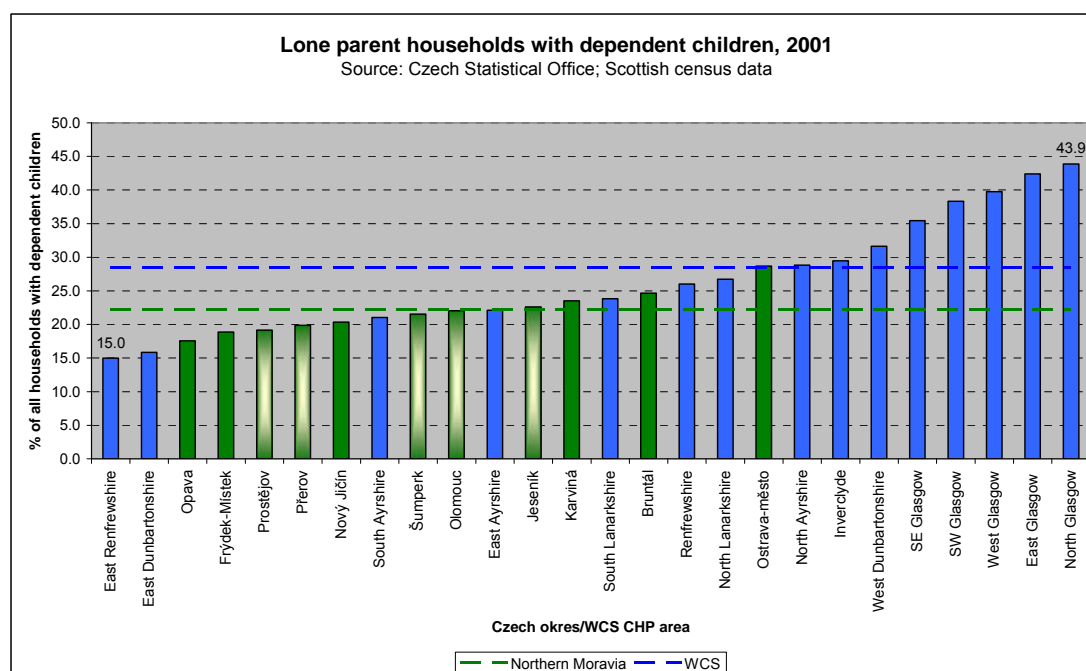
7.3 Single person households

An increasing amount of research evidence points to a range of health and well-being related benefits of living with a partner. Many studies have shown, for example, higher levels of mortality among single men compared to married men. [34, 35, 36, 37, 38, 39]

Combined with the higher proportion of lone parent households shown above, it is of potential interest, therefore, that the percentage of households that are 'single person' households is also considerably higher in WCS compared to Northern Moravia: in 2001, the figures were 34% and 29% respectively. These data are shown in Figure 7.8, which also shows that the figures have increased in both regions, but much more so in WCS: in 1981, the figure in the Scottish region was actually lower than that seen in the Czech area.

Figure 7.8

Single person households, 1980/81 - 2001
Source: Czech Statistical Office; Scottish census data

As with lone parent households, sub-regional analyses show that most of the areas with the highest rates are found in WCS. Of the 10 highest rates at this level, nine are found in WCS (Figure 7.9).

Figure 7.9

Single-person households, 2001
West Central Scotland local authorities and Northern Moravian districts
Sources: Czech Statistical Office; Scottish Census data
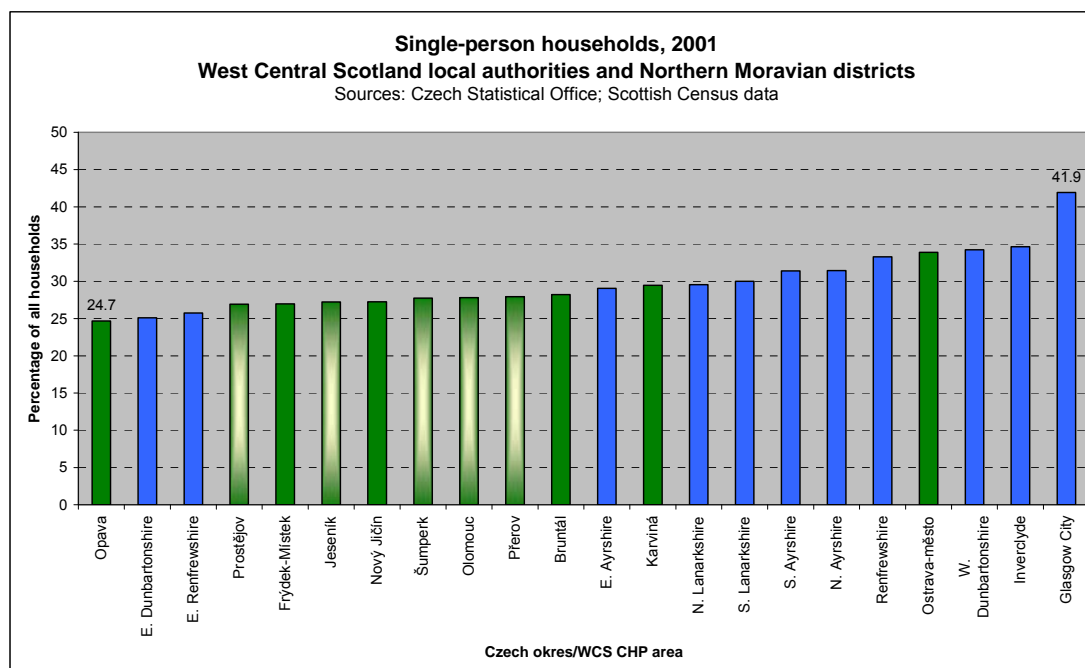
The HAPIEE study cohort allows us to analyse this issue in a little more detail i.e. in terms of marital status, rather than just household occupancy. This shows that compared to the their counterparts in Moravskoslezský, significantly fewer middle aged residents of Glasgow are married (53% vs. 76%), almost twice as many are separated or divorced (21% vs. 11.5%), and more than seven times as many are single (15.1% vs. 2%). These are shown in Figure 7.10. Note also that although not shown here, the data were broadly similar for both males and females.

Figure 7.10

Marital status among 45-69 year-olds:
Karvina/Havirov (N. Moravia) 2002-05 and Glasgow 2001
Source: HAPIEE study; Scottish Census data
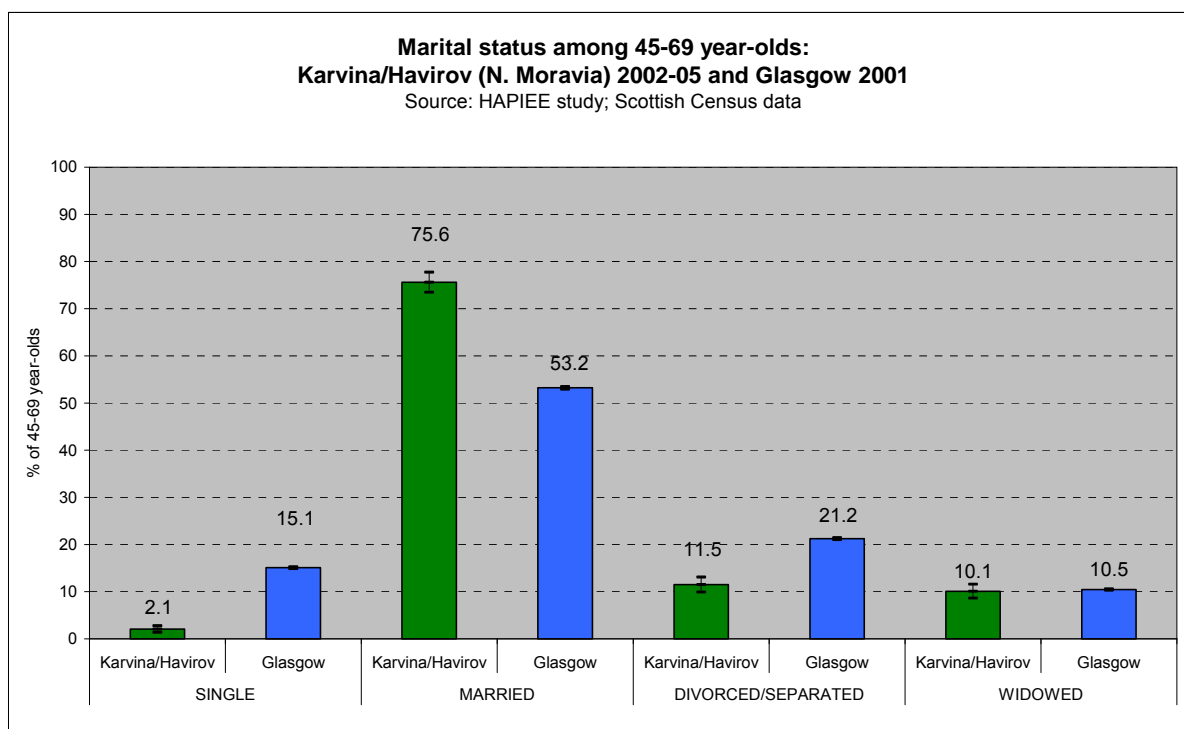
Sample size: Karvina/Havirov = 1,573; Glasgow: all persons aged 45-69 in 2001 (n = 147,819)

Note also that the above data are supported by the analyses of different survey data which are presented in the main report. These also showed that (at the overall regional level) a higher percentage of adults in the Czech region are married compared to those in WCS: 70% of 25-64 year olds in Northern Moravia compared to 63% in the Scottish region.

7.4 Social capital

As discussed elsewhere in the main section of the report, an increasing amount of research in recent years has pointed to the importance of 'social capital' and social networks in relation to health status[40, 41, 42, 43, 44]. With particular relevance to a post-industrial landscape, Stuckler and colleagues showed that the negative effects of mass privatisation (and associated employment loss) on mortality in post-Communist Eastern Europe were mitigated to a large degree by high levels of social capital among the population[45].

Any analysis of social capital is limited by deficiencies in the way it is measured. By its nature it is not a concept that lends itself easily to measurement, either by means of routine data sources or even dedicated survey tools (and in this case comparisons are made yet more difficult still by the different cultural, political and historical contexts of the two regions being analysed). In the main section of the report, we compared a number of commonly used proxy measures of social capital. These suggested that: *levels of trust* in people were higher in WCS than in Northern Moravia, *interest in politics* was higher in WCS, while levels of *attendance at religious ceremonies* and *voter turnout* were similar.

In this section of the case study, we use similar proxies for social capital: trust (from a different source), membership of clubs or organisations, and stated religious affiliation. Levels of voter turnout are presented again but in much greater detail. In the case of trust and membership of clubs/organisations we use data from the middle aged (45-64) HAPIEE study cohort compared to similar survey data for Glasgow.

Figure 7.11 shows that among 45-64 year-olds, there appears to be significantly higher levels of *trust* among Glaswegians (i.e. a higher percentage of survey respondents agreeing that they can trust people in their local area) than among the two Northern Moravian towns included in the HAPIEE study[xix]. This corresponds with the other data on trust presented in the main report.

[xix] Note, however, that the questions are worded slightly differently in the two questionnaires, and this may lead to a slightly different interpretation of the question on the part of the survey respondents in the two regions.

Figure 7.11

Social capital: % of 45-69 year-olds who say they can trust people in their local area
Karvina/Havirov (N. Moravia) 2002-05 and Glasgow 2008
Source: HAPIEE study; NHSGGC HWB Survey
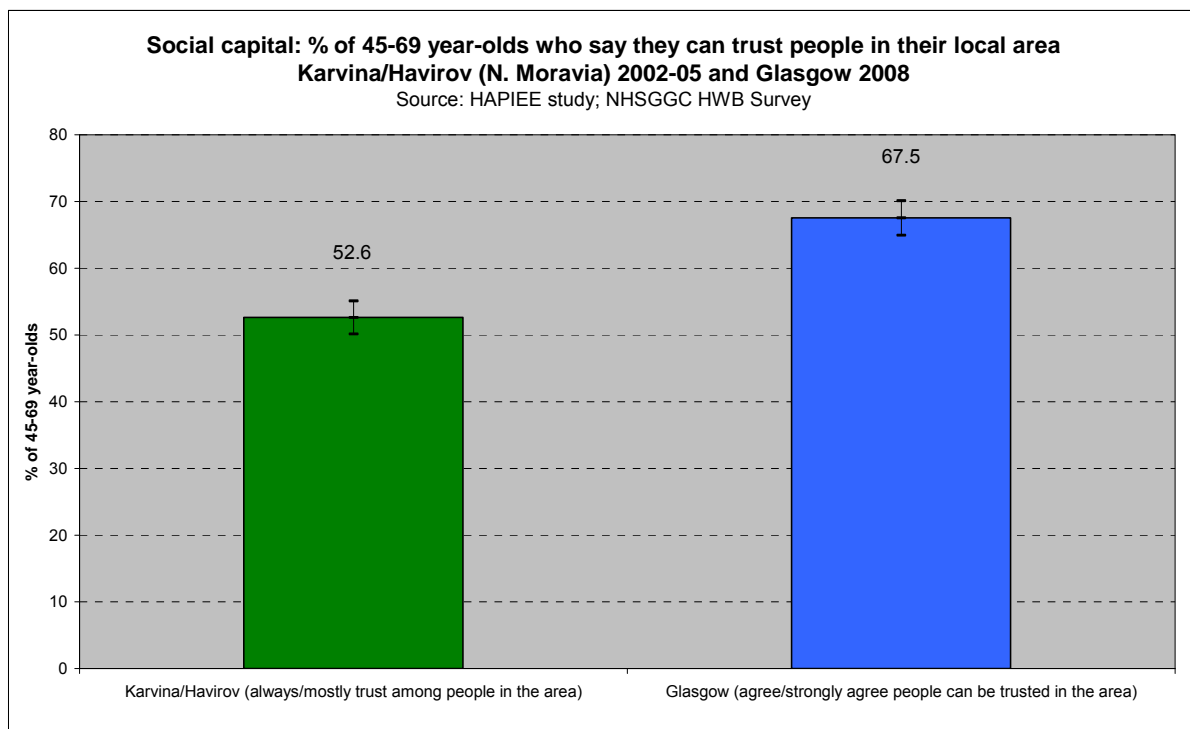
Sample size: Karvina/Havirov = 1,560; Glasgow = 1,259

In contrast to the above, however, Figure 7.12 suggests that much lower numbers of middle aged residents of Glasgow are *members of clubs or organisations* compared to similarly aged inhabitants of the two Northern Moravian towns. Note, however, that as with the 'trust' question above, the the question is worded slightly differently in the two surveys and this may influence the results to a degree.

Figure 7.12

**Social capital: % of 45-69 year-olds who are members of clubs, organisation etc.,
Karvina/Havirov (N. Moravia) 2002-05 and Glasgow 2008**
Source: HAPIEE study; NHSGGC HWB Survey

N. Moravia: Are you a member of club or organisation (sports club, church, political party)? (yes/no);
Glasgow: Do you belong to any social clubs, associations, church groups or anything similar? (yes/no)
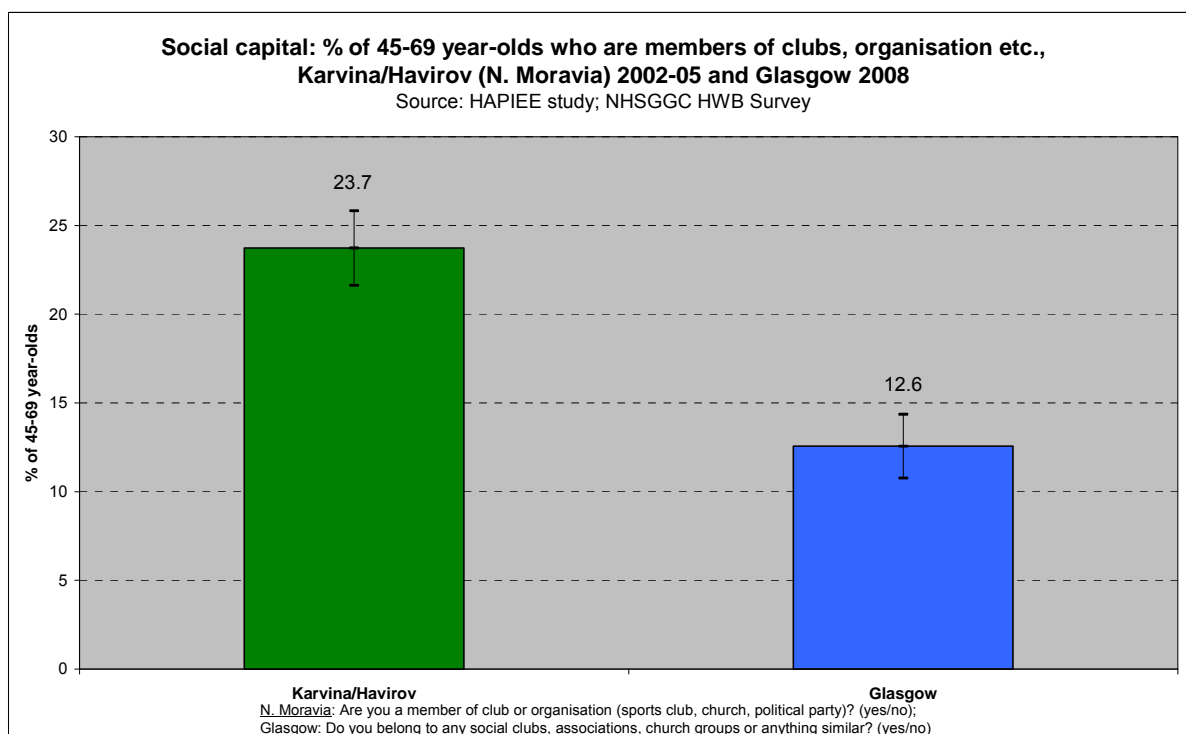
Sample size: Karvina/Havirov=1,560; Glasgow=1,306

Figure 7.13 shows that compared to WCS, a much higher percentage of the total population of Northern Moravia declared themselves to have *no religious affiliation* in the 2001 census: 51% compared to 21%. Similar percentages were recorded for Moravskoslezský and Olomoucký. The figures vary considerably by district (Figure 7.14).

Figure 7.13

% of population with no religious affiliation, 2001
Source: Czech Statistical Office; Scottish Census data

Figure 7.14

% of population with no religious affiliation, 2001
Source: Czech Statistical Office; Scottish 2001 census data
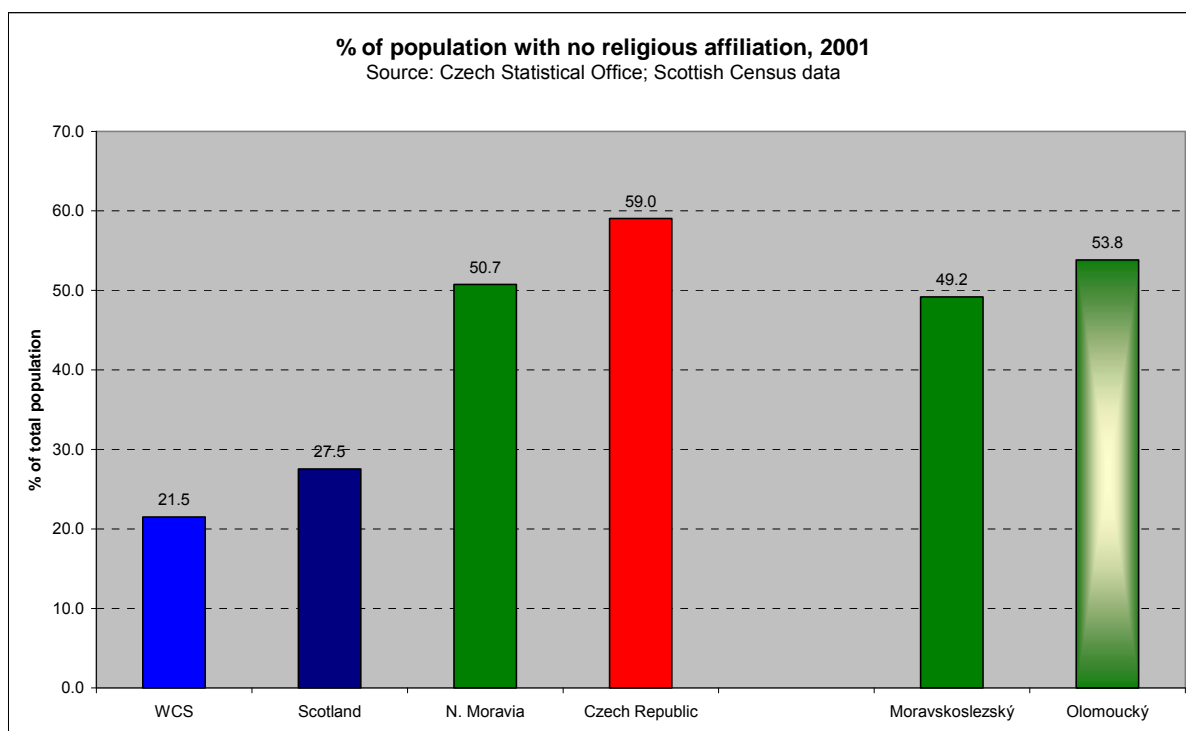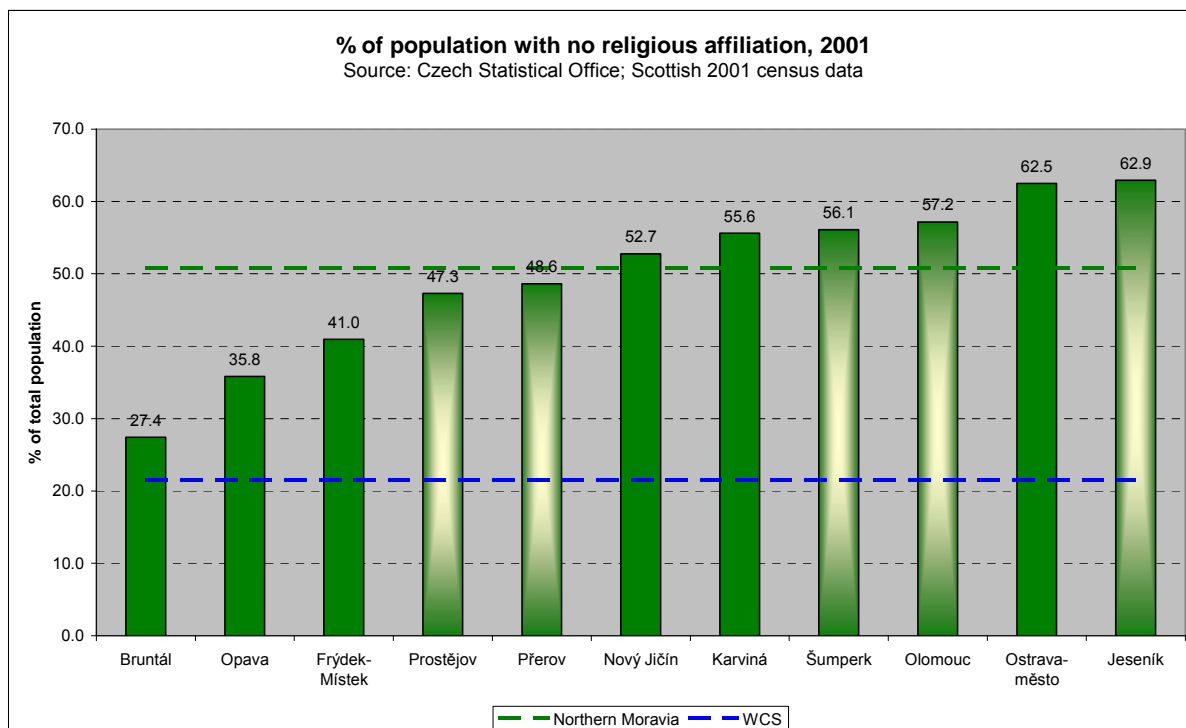
Comparison of these data with the 1991 census (not shown here) show a 52% increase in the percentage of the Northern Moravian population describing themselves in these terms. However, it is likely that the 1991 figures are influenced by a post-Communist 'state of mind', whereby the population were, for the first time, 'allowed' to state they were religious. The 50% increase between 1991 and 2001 was seen across the whole country. Trend data for WCS are not available as 2001 marked the first census in which the question was asked.

In terms of *voter turnout*, Figure 7.15 presents time trend data for Northern Moravia and WCS for the period 1987-1990 to 2005-2006[xx]. It is notable that the first post-Communist elections to the Czech Parliament resulted in a near total turnout: 97% of the electorate in Northern Moravia voted: 96% in Moravskoslezský, 98% in Olomoucký. The figure for the country as a whole was also 97%. However, following 10 years of democracy, turnout had fallen to WCS levels of around 56% (although it increased slightly in 2006).

[xx] Note: these data are based on the Czech elections of 1990, 1992, 1996, 1998, 2002 and 2006, and Scottish elections (for Westminster parliament) of 1987, 1992, 1997, 2001 and 2005

Figure 7.15

Electoral turnout: Czech Parliament (Chamber of Deputies) & Westminster elections 1987/90- 2006
Source: Czech Statistical Office; UK Election Results (David Boothroyd); Craig (1999)
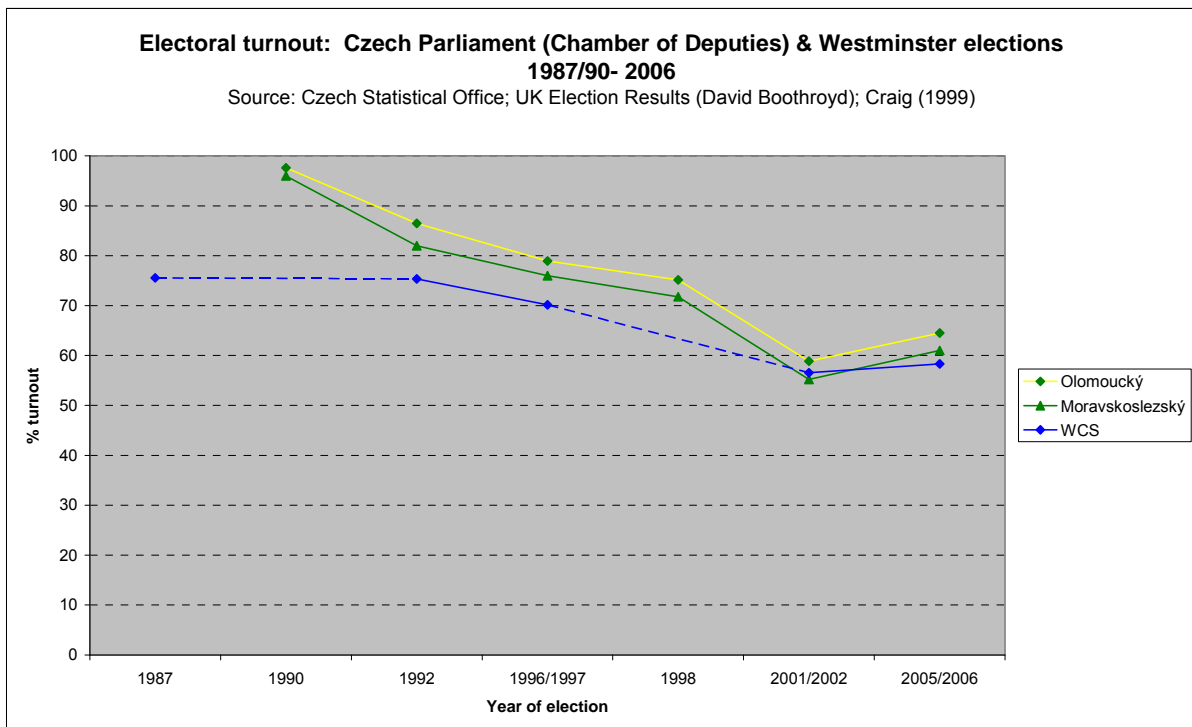
Figure 7.16 shows the same 2006 voter turnout data for the Czech *okresy* compared to data for WCS parliamentary constituencies at the 2005 Westminster elections. Turnout is notably similar – around 60% – across the majority of areas. However, WCS appears more polarised, with considerably higher turnout in its two most affluent constituencies (Dunbartonshire East and Renfrewshire East) and considerably lower (45-50%) in a number of Glasgow constituencies.

Figure 7.16

Voter turnout, 2005 UK General Election and 2006 Czech Republic Election to the Chamber of Deputies of the Parliament of the Czech Republic West Central Scotland UKPCs and Northern Moravian districts

Sources: www.ukpolitical.info; Czech Statistical Office
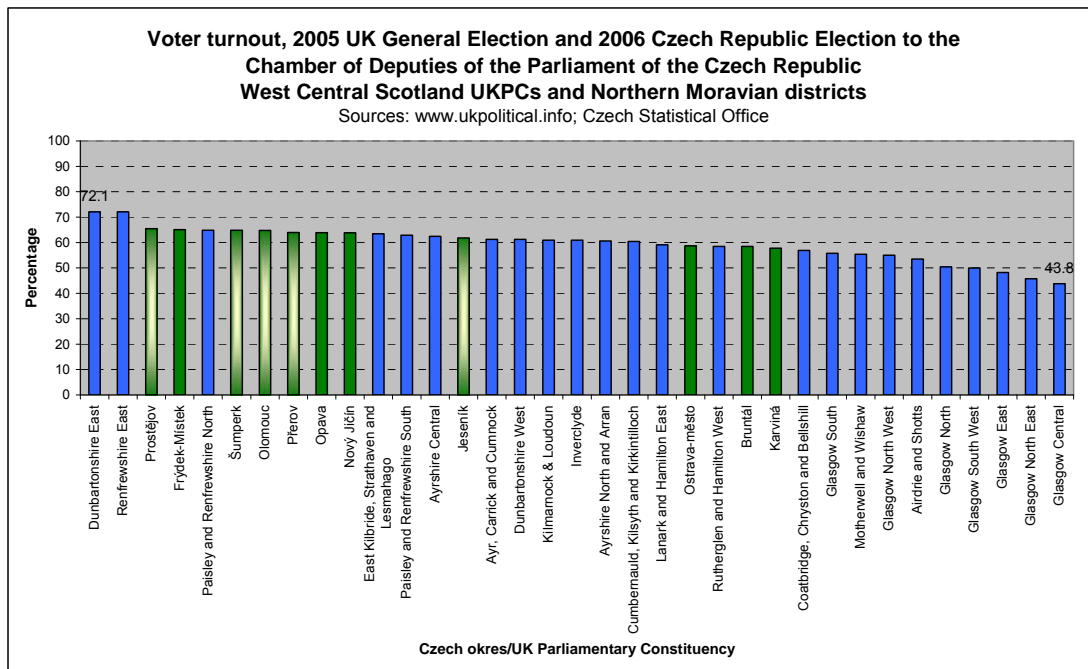
Summary: Social environment

The indicators presented within this section under the broad heading of 'social environment' show a rather 'mixed picture' in terms of how WCS compares with the Czech region. For example:

- In terms of **education attainment**, the analyses reinforce previous research suggesting that although WCS compares well in terms of having a high percentage of its adult population with tertiary level qualifications, it also compares poorly in terms of having a relatively high number of adults with no educational qualifications at all. These differences are seen across all the sub-regions analyses here, not just at the level of WCS and Northern Moravia.

- WCS has a much higher proportion of **lone parent households** than is the case in Northern Moravia.

- WCS similarly has a considerably higher proportion of its adult population **living alone**. Furthermore, detailed survey information suggests that among its middle aged population significantly higher numbers are single and/or divorced/separated, and significantly lower numbers are married, compared to their counterparts in Northern Moravia.

- WCS compares well in terms of some proxy measures for **social capital** (e.g. trust, religious affiliation (although the low levels of the latter in the Czech region may be influenced by aspects of political history)), but poorly in relation to others (e.g. membership of clubs/organisations). Voter turnout in WCS (historically low by Scottish and UK standards) is comparable to that now seen in Northern Moravia.

- For some of the indicators analysed at sub-regional level, there is a suggestion of greater spatial polarisation in WCS compared to Northern Moravia. For example, compared to the Northern Moravian *okresy* (districts), WCS's sub-regions (local authority areas, parliamentary constituencies) have both the highest and lowest rates of lone parent households, single person households and voter turnout.

8. The Physical environment

The environment in which people live and work can influence health both directly (through toxic, allergenic, or infectious agents) and indirectly through influencing behaviours (e.g. availability of a local environment in which to walk or cycle) and through impacting on mental health and well-being. Its influence, therefore, covers both traditional environmental issues (air, water, pollution) and those related to the social sphere (housing, neighbourhoods, safe areas etc.).

It is, therefore, an extremely important area of health. In relation to this case study, however, it is also an area for which comparable Scottish and Czech data are extremely difficult to obtain. In this section we briefly revisit some of the data presented in the main section of the report (climate; overcrowding) and also examine data relating to crime and neighbourhood safety. Unfortunately, a more comprehensive analysis of environmental data for the two regions is simply not possible.

8.1 Climate

Climate, and more specifically lower levels of Vitamin D resulting from less sunshine, has been suggested as one reason for Scotland's enduring poor health status[46]. Lower levels of vitamin D have been linked with a range of diseases, including a number of different forms of cancer. Figure 8.1 shows that, for example, in 2005 Glasgow (the main city of WCS) received less sunshine ('daily irradiation') than Ostrava (the main city of Moravskoslezský) in 10 out of the 12 months of the year[xxi]. However, it is difficult to draw any firm conclusions about the impact of this without a dedicated study which could compare not only levels of vitamin D deficiency (Hypovitaminosis D) among the two populations, but which could also control for the effects of a

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[xxi] Unfortunately, data are only available for 2005. Using one year's data may of course present a skewed picture, and it would be preferable to show data average over several years (were such information available)

whole range of confounding factors (diet, socio-economic status, family history etc.). As such a study does not exist, we must remain cautious in interpreting any climate related data for the regions.

Figure 8.1

Monthly average daily irradiation, Ostrava (N. Moravia) and Glasgow, 2005
Source: Solar Radiation Data (SoDA)
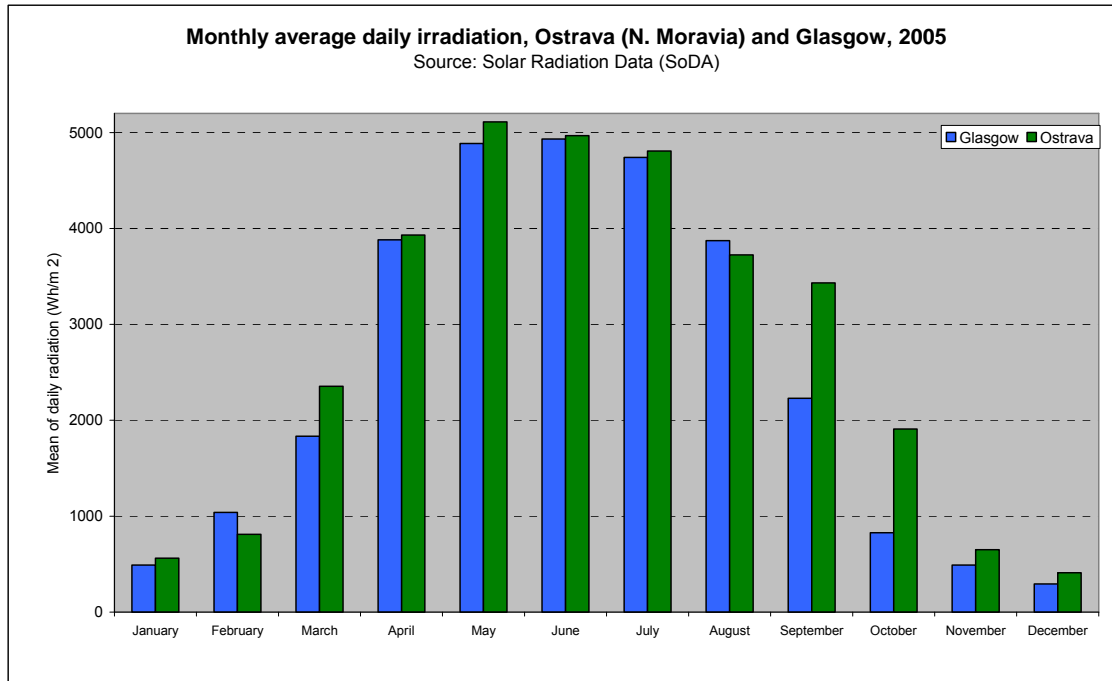
8.2 Overcrowding

Overcrowding is a potentially important indicator of the physical environment in relation to health. The indicator has been used effectively in a number of area-based deprivation measures in the UK which are highly correlated with health outcomes[47, 48]. The main section of the report compared a very crude measure of overcrowding – number of rooms per head of population – derived from census information. This suggested that overcrowding is potentially more of an issue in Northern Moravia than in WCS. The data are re-presented in Figure 8.2 below.

Figure 8.2

Rooms per head of population, 2001
Source: Czech Statistical Office; Scottish Census data
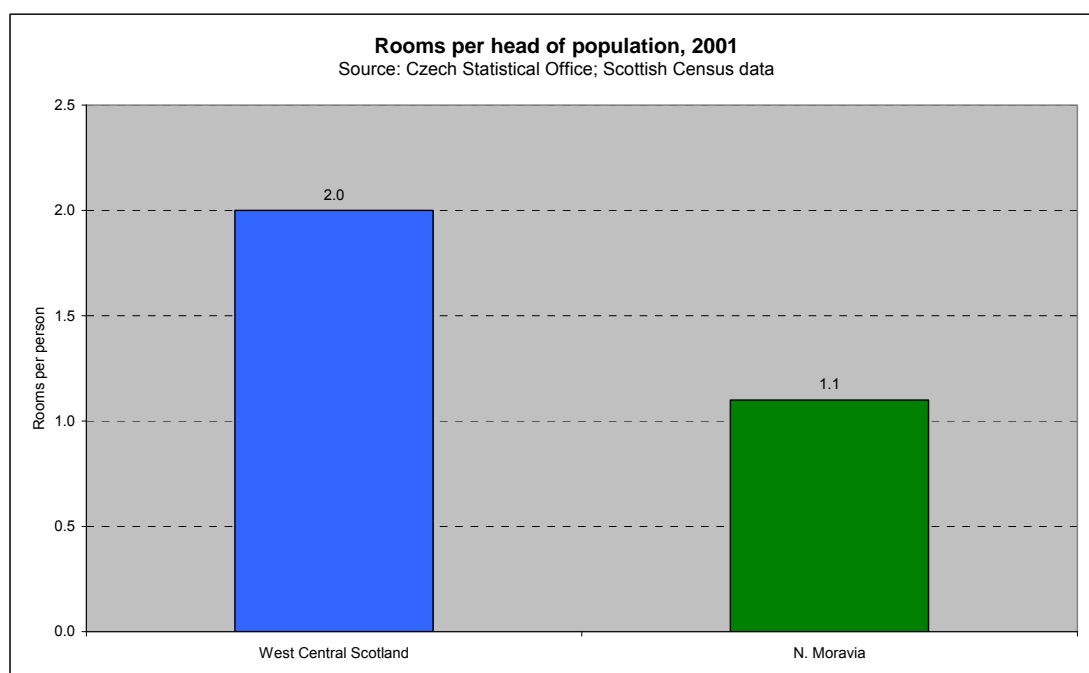
8.3 Neighbourhood safety

The main report also presented data derived from different surveys which suggested that, compared to residents of WCS, significantly fewer residents of Northern Moravia felt safe walking in their neighbourhoods alone after dark: 61% compared to 71% in WCS. Comparison of HAPIEE data and Scottish survey data for middle-aged residents of Havirov/Karviná and Glasgow suggests a similar picture (Figure 8.3)[xxii].

[xxii] Note, however, that the wording in the questionnaires on which the data are based is slightly different, and this may impact on the results

Figure 8.3

Perception of safety at night: % of 45-69 year-olds who feel safe in their areas of residence at night, Karvina/Havirov (N. Moravia) 2002-05 and Glasgow 2005/06
Source: HAPIEE study; Scottish Household Survey

Chart showing two bars. Y-axis labelled "Percentage" from 0 to 100. Karvina/Havirov (always/mostly feel safe in area at night) = 61.2. Glasgow (feel very/fairly safe walking alone after dark) = 66.0.

Sample size: Karvina/Havirov = 1564; Glasgow = 980

8.4 Crime

Comparisons of crime levels between Northern Moravian and WCS neighbourhoods are difficult to make because of a number of factors, not least the different recording systems in place in the two regions. Czech police data suggest that the total crime rate in the Northern Moravia region has generally been falling (Figure 8.4); this is also the case in WCS (Figure 8.5). Comparisons between the rates of the two regions would suggest that total crime levels may be considerably higher in WCS: however, that may reflect recording and definitional issues more than anything else.

Figure 8.4

'Ascertained offences': crude rates per 1,000 population, N. Moravia 1991-2008
Source: Czech Police HQ

Figure 8.5

Total number of crimes recorded by the police, Scotland and WCS, 1990-2007
Crude rates per 1,000 population
Source: Justice Analytical Services - Scottish Government
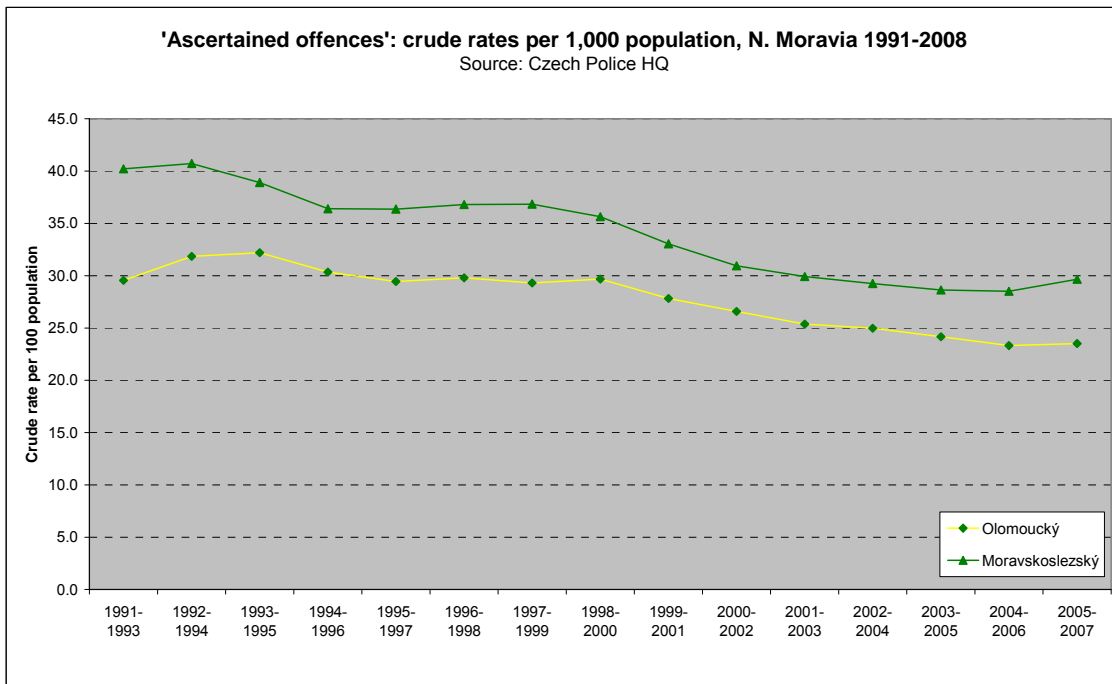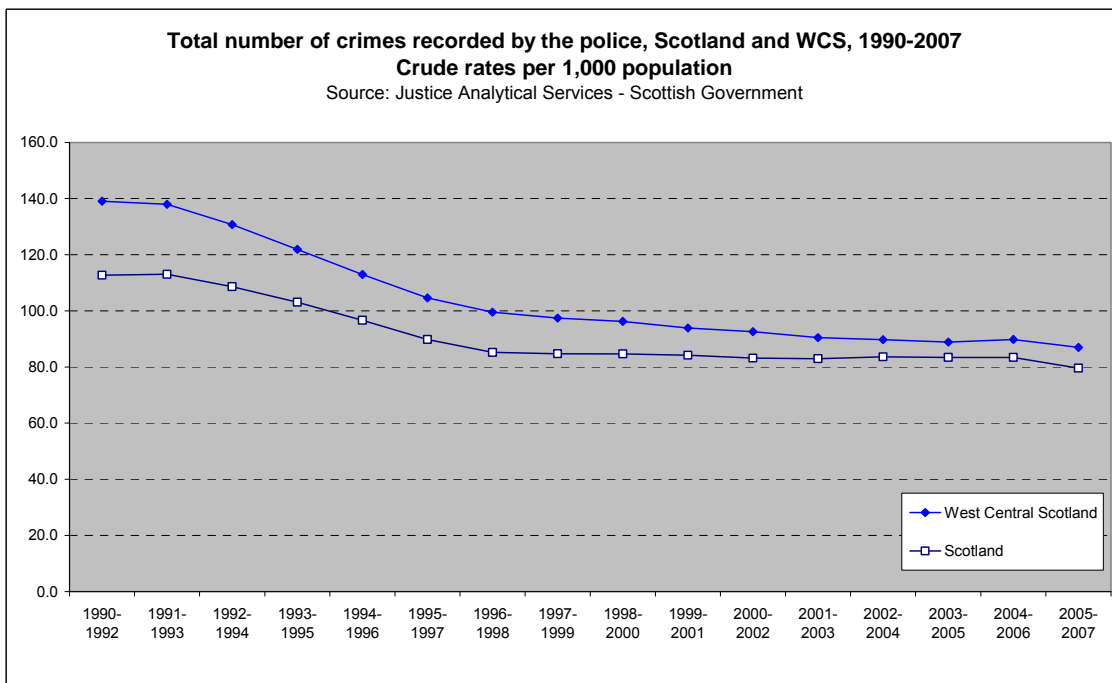
Summary: The Physical environment

Limitations in the availability and comparability of **physical environment** related data make this an unsatisfactory section of the case study, and it is difficult to draw any firm conclusions in terms of what the data show.

However, from what is available, WCS would appear to compare relatively favourably in relation to **overcrowding**, **perception of safety** and (possibly) **crime levels**; at the same time, it would appear to compare unfavourably in relation to **climate**.

9. Health behaviours

In this section we briefly examine three key behavioural factors for the middle-aged (45-64) populations of Glasgow compared to the Moravskoslezský towns of Havirov and Karviná. These are: smoking, problem drinking and obesity.

9.1 Smoking

Figure 9.1 shows that a higher percentage of middle-aged Glaswegian females are smokers compared to the Czech counterparts. Figures are higher also for Glaswegian males, but not to a statistically significant degree.

Figure 9.1

Percentage of 45-69 year-olds who smoke
Karvina/Havirov (N. Moravia) 2002-05, and Glasgow 2005-06
Source: HAPIEE study; Scottish Household Survey
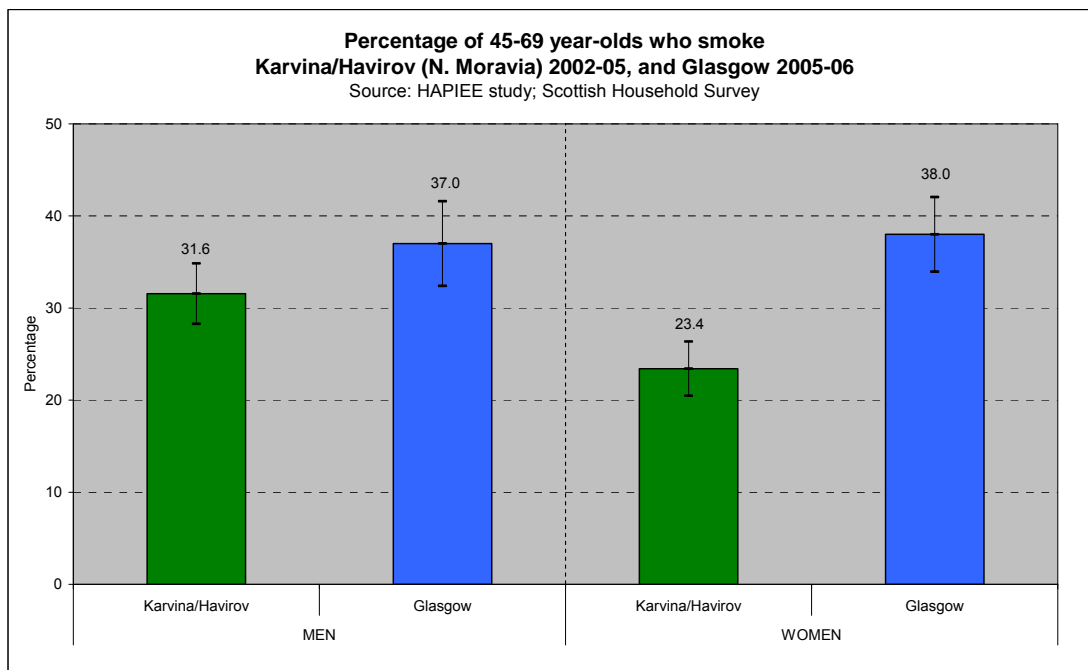
Sample size: Karvina/Havirov = 1567; Glasgow = 976

9.2 Alcohol

Comparable levels of total alcohol consumption in the two populations are not available. However, we can measure levels of 'problem' drinking though use of the 'CAGE' survey tool. CAGE is based on answers to four questions relating to whether respondents have: felt the need to reduce their

levels of drinking; been annoyed by other people's criticism of their drinking; felt guilty about drinking; ever taken an alcoholic drink first thing in the morning[xxiii]. A score of two or more has been used to indicate potential problem drinking. However, as Figure 9.2 shows, although analysis of the two surveys suggest that a higher percentage of respondents in Greater Glasgow obtained a score of 2 or more, the relatively small sample size means that the differences cannot be considered significant.

Figure 9.2

% of 45-69 year-olds classified as 'problem drinkers' (CAGE score of 2+)
Karvina/Havirov (N. Moravia) 2002-05, and Greater Glasgow 2003
Source: HAPIEE study; Scottish Health Survey 2003
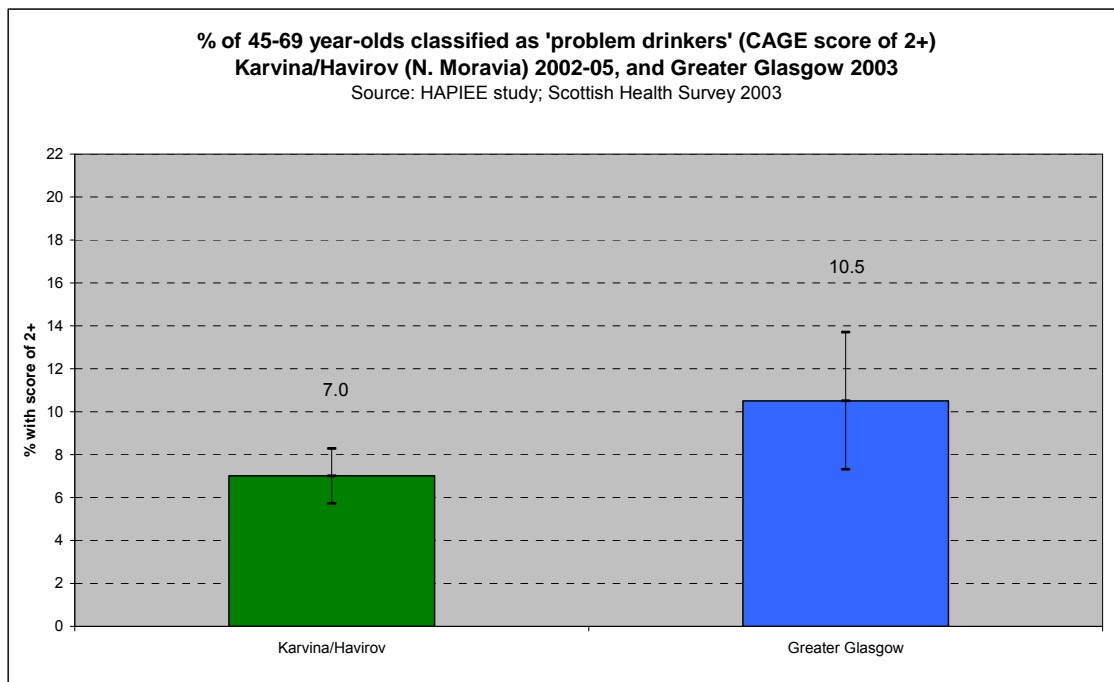
Sample size: Karvina/Havirov = 1541; Glasgow = 354

9.3 Obesity

Figure 9.3 shows that the percentage of the adult, middle-aged population in the Czech towns and in Greater Glasgow that are classified as obese are actually very similar. The figures are slightly higher among the Czech respondents, but not to a significant degree.

[xxiii] The actual four 'CAGE' questions are: 1) Have you ever felt you needed to **C**ut down on your drinking? 2) Have people **A**nnoyed you by criticizing your drinking? 3) Have you ever felt **G**uilty about drinking? 4) Have you ever felt you needed a drink first thing in the morning (**E**ye-opener) to steady your nerves or to get rid of a hangover?

Figure 9.3

**% of 45-69 year-olds classed as obese (BMI >= 30),
Karvina/Havirov (N. Moravia) 2002/05 and Greater Glasgow, 2003**
Source: HAPIEE study; Scottish Health Survey (SHeS)
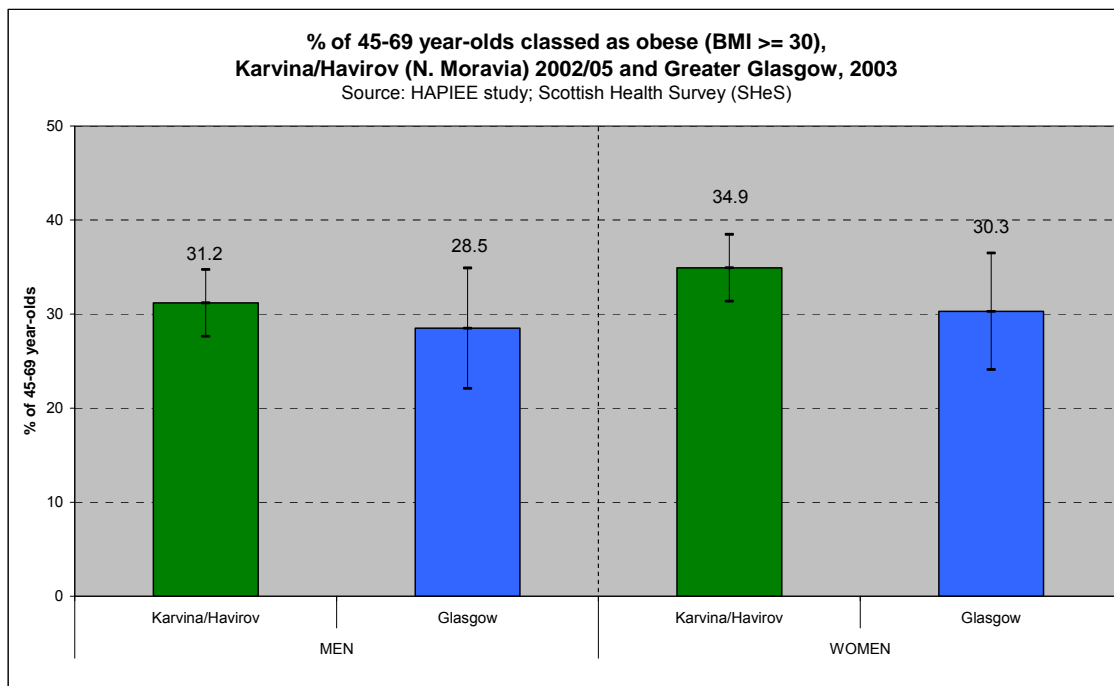
Sample size: Karvina/Havirov = 1344; Glasgow = 406

Summary: Health behaviours

As with the previous section on the physical environment, comparable data on health behaviours are limited. No information is available, for example, in relation to levels of physical activity, diet, drugs misuse or total levels of alcohol consumption. In relation to the latter, however, the analyses undertaken for the first *Aftershock* report showed rates of liver cirrhosis mortality to be higher among the WCS population, suggesting higher consumption among part of the population. Data shown here also suggest higher levels of **problem drinking**, although the small sample sizes mean we cannot be sure. The section has also shown there to be no significant differences in levels of **obesity** among middle aged residents, nor in relation to male **smoking** prevalence. Female smoking prevalence was, however, higher in WCS.

10. Child and maternal health

In the penultimate section of this case study, we briefly compare indicators relevant to the important topic of child and maternal health. Note that a handful of indicators presented elsewhere in this report (e.g. lone parent households, fertility rates) are clearly also relevant to this section.

Important data have also already been presented in the main report. These showed that:

- *births to young mothers* (age <20) are much more common in WCS than in Northern Moravia (in 2005-06, 8.5% of all births in WCS were to mothers under 20; the equivalent figure for Northern Moravia was 4.2%);
- the percentage of babies who are of *low birth-weight* is higher in WCS than in Northern Moravia;
- *termination of pregnancy* rates are similar between the two regions.

In this section we look in more detail at two of these indicators, both in terms of trends and sub-regional figures: low birth-weight babies and terminations of pregnancy. We also compare rates and trends in teenage terminations of pregnancy, and consider data on infant mortality.

10.1 Infant mortality

Figure 10.1 shows trends in infant mortality rates between 1995-1997 and 2005-2007. This shows that infant mortality rates in WCS are now higher than in Northern Moravia. This is principally due to a rapid decrease in infant deaths in the Czech region since mid 1990s. Rates in WCS did not change markedly between 1997 and 2005; however, as was shown in the first *Aftershock* report (and in many other publications), they decreased year on year prior to 1996.

Figure 10.1

Infant deaths per 1,000 live births (3 year rolling averages), 1995-2005
Source: calculated from data from GRO(S) and Institute of Health Information & Statistics of Czech Republic
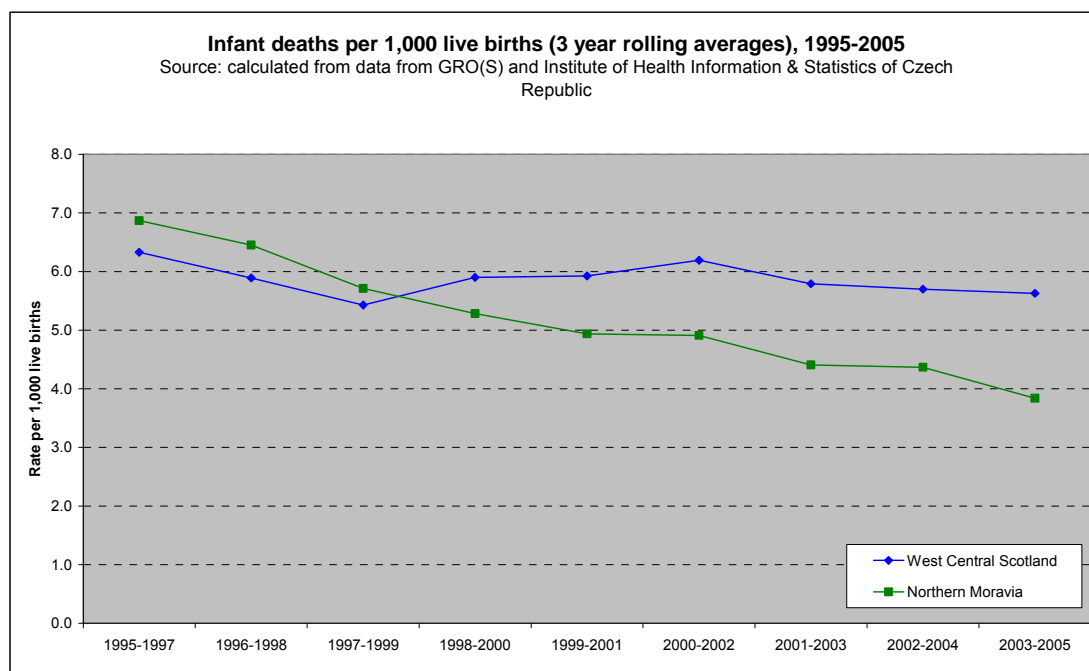
10.2 Low birth-weight babies

Figure 10.2 shows trends in the percentage of low birth-weight babies born in WCS and Northern Moravia (and its two constituent parts, Moravskoslezský and Olomoucký) between 1980 and 2007. Rates have consistently been higher in WCS, although the gap narrowed between 2005 and 2007, principally because of a decrease in rates in WCS. Figure 10.3 presents the same data for the most recent period only, but broken down by sub-region (*okresy* in Northern Moravia; local authority areas in WCS). This shows that the higher rates of low birth-weight births in WCS are driven by particularly high rates in Glasgow, Inverclyde and Ayrshire (North and East). Indeed it is notable that the six sub-regions with the highest rates are all in WCS.

Figure 10.2

Low birthweight (<2500g) babies as a percentage of all live births, 1980-2007
Source: Czech Statistical Office; ISD Scotland

Figure 10.3

Low birthweight (<2500g) babies as a percentage of all live births, 2005-07
Source: Czech Statistical Office; ISD Scotland
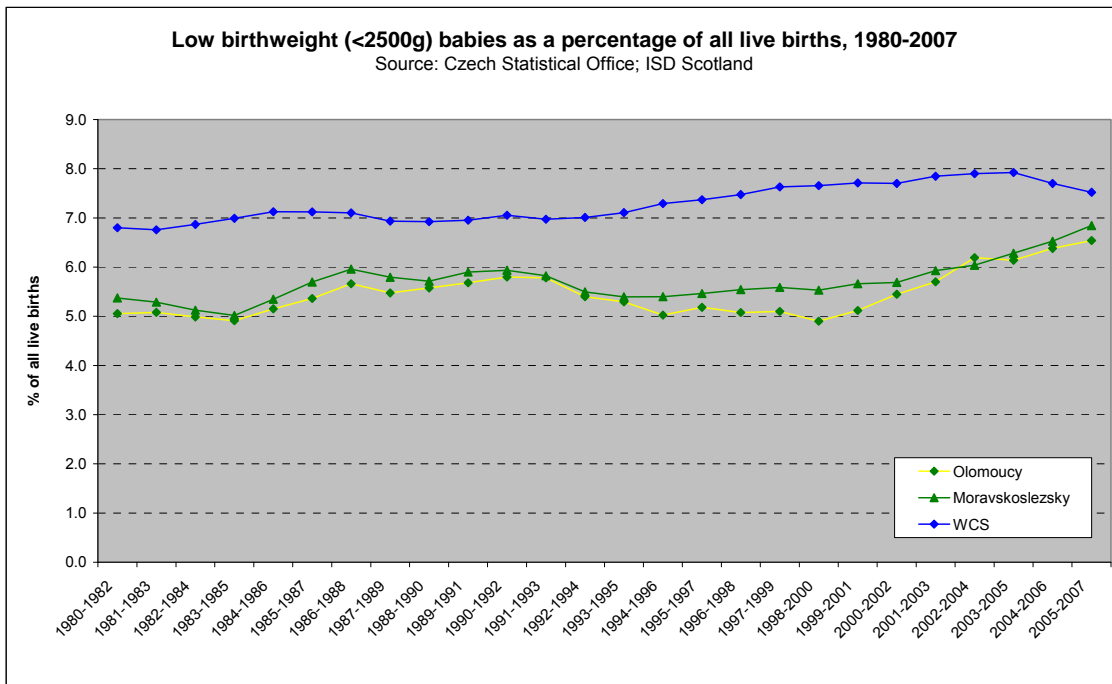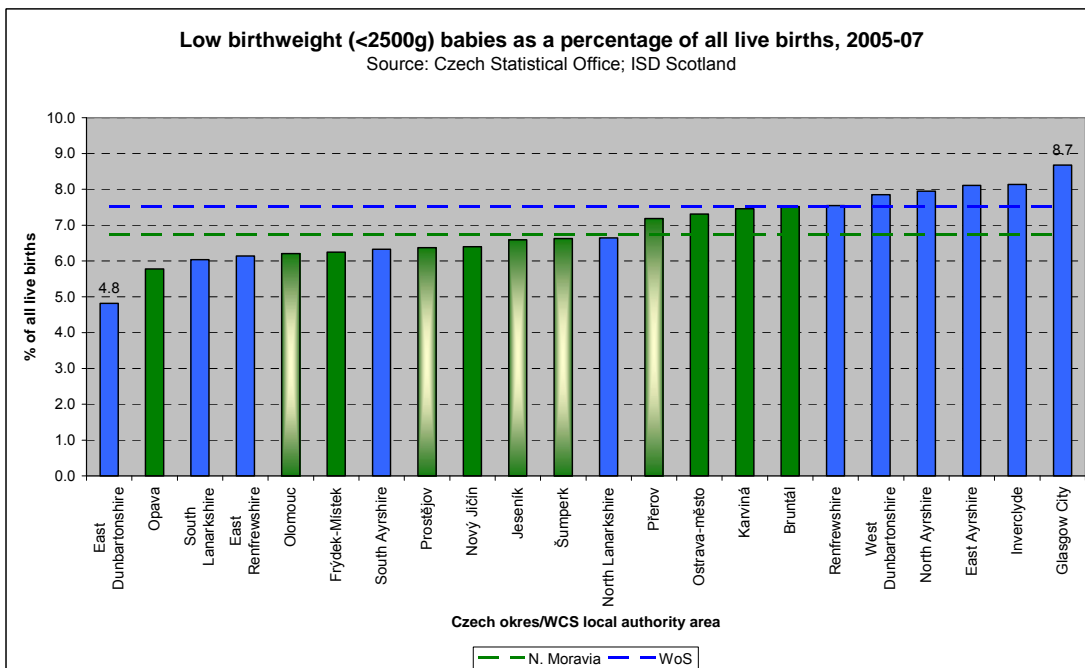
10.3 Terminations of pregnancy

We must be very cautious in making cross-country comparisons of abortion statistics. This is not just because of cultural differences that might influence such data, but in particular because of different legal requirements that exist in different countries. In the Czech Republic the gestational limit at which terminations of pregnancy are normally allowed is 12 weeks whereas in the UK (and obviously WCS) terminations are legally allowed up to 24 weeks[49,50]. However, other criteria which require to be met in relation to granting abortion requests also differ: terminations can be granted for a wider set of reasons in the Czech Republic compared to the UK[xxiv].

Historically, termination of pregnancy rates in the Czech Republic were very high. As Figure 10.4 shows, this was true of Northern Moravia as well. However, Figure 10.4 also shows that rates in the region (and the country as a whole) have decreased markedly since the later 1980s. The figure for Northern Moravia in 2005-2007 was less than a third of that in 1987-1989. This decrease has been attributed to wider availability of reliable contraception and better sex education[14, 51]. Figure 10.4 also shows that, in contrast, rates among WCS females have been increasing: although the WCS figure for 2005-2007 was still lower that of Northern Moravia, the rates in WCS have doubled over a 20-25 year period.

[xxiv] Grounds on which abortion can be permitted in the Czech Republic: to save the life of the woman; to preserve physical health; to preserve mental health; rape or incest; foetal impairment; economic or social reasons; available on request. In the UK abortions are not available automatically 'on request'; nor does the 'rape or incest' criterion apply. However, the other grounds listed above (to save the life of the woman; to preserve physical health; to preserve mental health; foetal impairment; economic or social reasons) also apply to the UK.

Figure 10.4

Terminations of pregnancy per 100 females aged 15-44, 1980-2007
Source: Czech Statistical Office/ISD Scotland
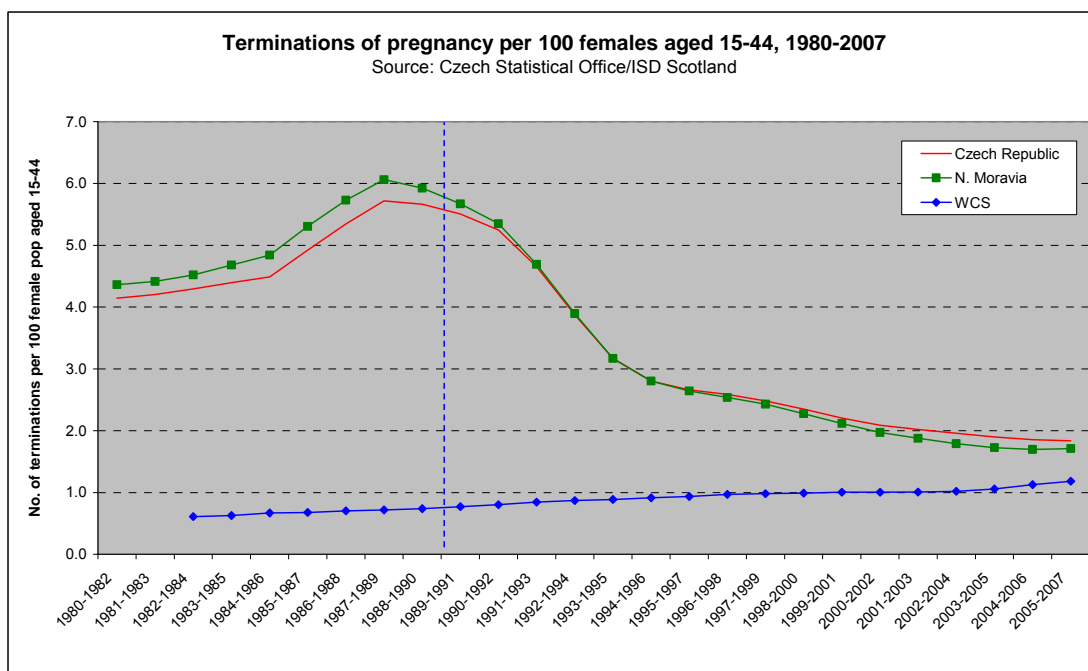
Sub-regional analyses (in this case Czech *okresy* compared to WCS local authority areas) for 2004-2006 show that the current higher rates of abortion in Northern Moravia are seen across the whole region i.e. rates are higher in every *okres* compared to the Scottish local authority areas. This is shown in Figure 10.5.

Figure 10.5

Terminations of pregnancy per 100 females aged 15-44, 2004-06 (3 year average)
West Central Scotland local authorities and Northern Moravian districts
Sources: Source: Czech Statistical Office; ISD Scotland
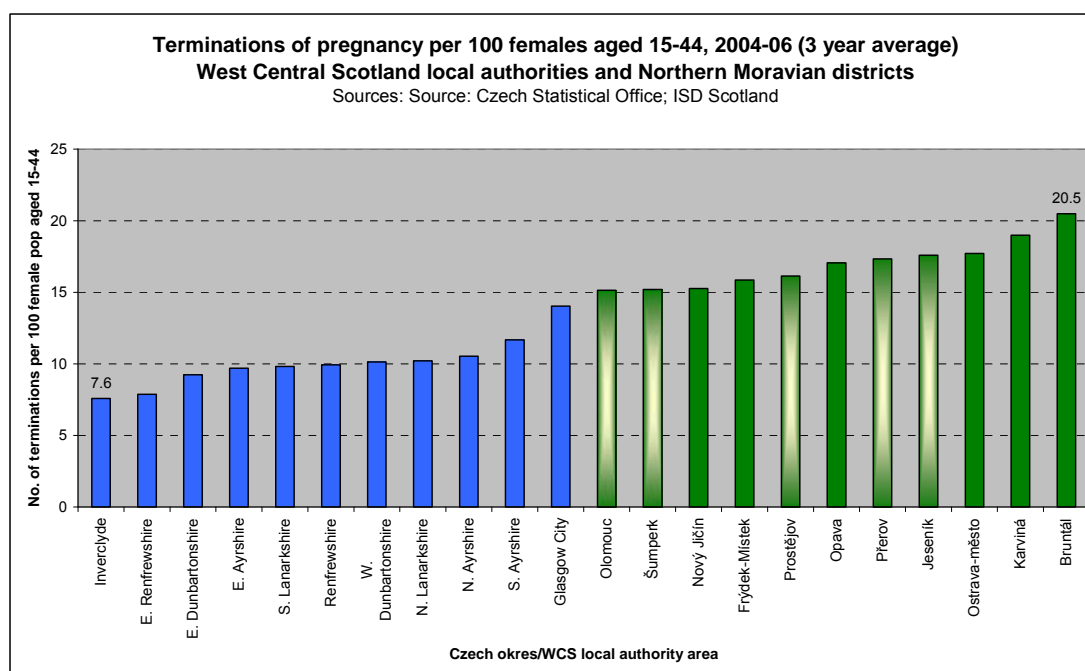
10.4 Teenage terminations of pregnancy

The contrast between the decreasing abortion rates seen in Northern Moravia and the increasing rates seen in WCS is particularly striking in the case of *teenage* termination of pregnancy rates. Figure 10.6 show trends in termination rates among females aged 13-19[xxv]. While rates among Northern Moravia teenagers have decreased by around 60%, in WCS they have *increased* by more than 40%. This decrease is seen across all Northern Moravia *okresy,* with all districts having lower rates than that of WCS (Figure 10.7).

[xxv] Note that for reasons of data availability, these are shown as percentages of 15-19 year-olds (rather than 13-19 year olds)

Figure 10.6

Teenage (13-19) terminations of pregnancy per 100 females aged 15-19, 1992-2007
Source: Czech Statistical Office; ISD Scotland

Figure 10.7

Teenage (13-19) terminations of pregnancy per 100 females aged 15-19, 1992-2007
West Central Scotland and Northern Moravian districts
Source: Czech Statistical Office; ISD Scotland
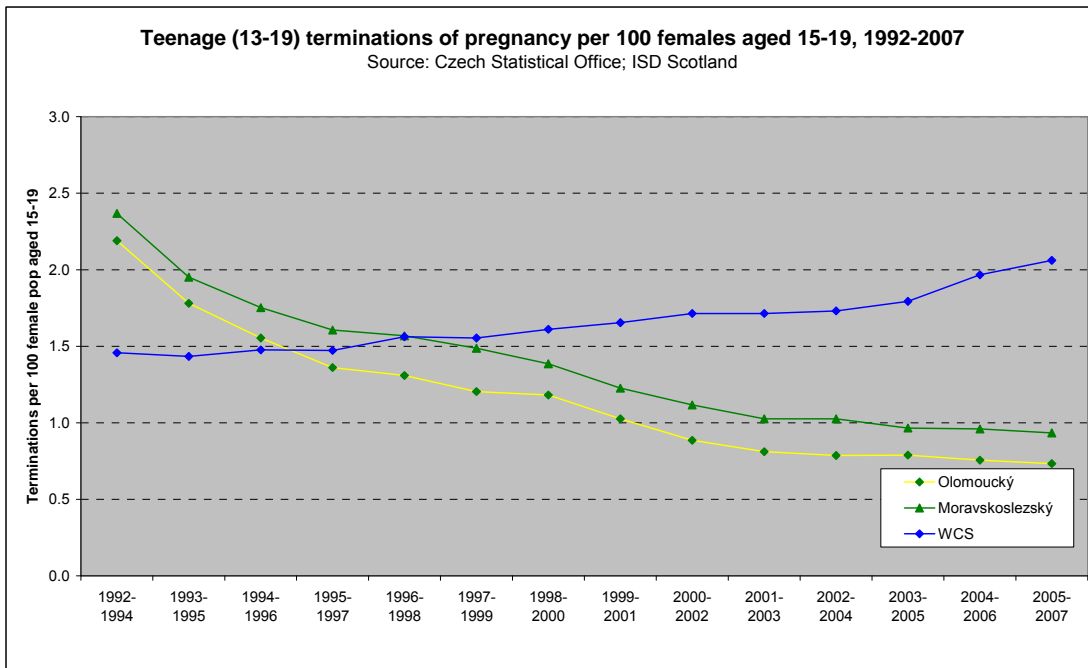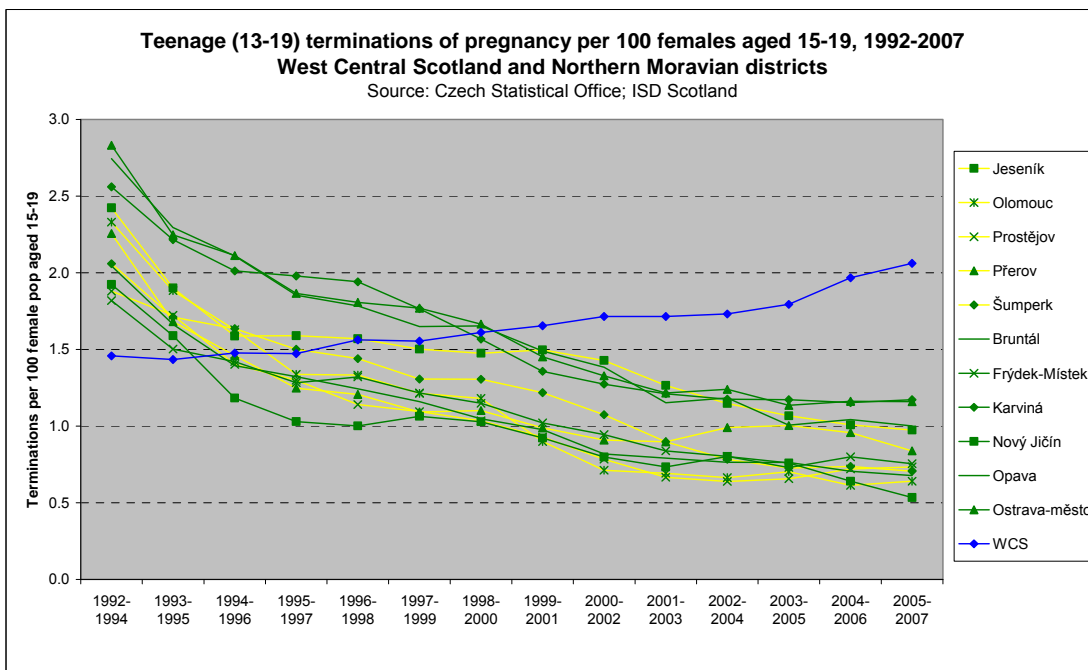
Although, as stated above, given the different legal, definitional and cultural influences on abortion rates in the two countries, interpretation of trends can be problematic, Figures 10.6 and 10.7 still highlight a worrying trend among teenagers in WCS. Although the Scottish data are neither new nor surprising, taken in conjunction with the data already presented on teenage mothers and lone parents (many of whom are also relatively young[52]), this topic area is one of the few where clear and consistent differences between the Scottish and Czech populations emerge.

10.5 Other indicators

As with every section of the case study, analyses are limited by the availability of comparable regional data. Data for other important child and maternal health related topics such as breastfeeding, and adolescent health behaviours are not available at this level. However, national comparisons suggest that *breastfeeding* rates in the Czech Republic are twice that of Scotland[xxvi, 53], while survey comparisons of 15 year-olds suggest that although *smoking* rates are slightly higher among Czech boys than their Scottish counterparts, *alcohol use, cannabis use* and *sexual experience* are more common among Scottish teenagers compared to Czechs of the same age[54].

[xxvi] Percentage of infants breastfed at three months of age – Czech Republic: 61.2%; Scotland: 30%

Summary: Child and maternal health

Analyses of child and maternal health related indicators highlight a number of areas of concern. For example:

- **Births to teenage mothers** are considerably higher in WCS than in Northern Moravia.
- Similarly, **teenage abortion rates** are also much higher, and are increasing, in WCS.
- Births of **low birth-weight babies** are higher in WCS.
- Although **infant mortality** rates are comparable to most European post-industrial regions[1], they are higher than in Northern Moravia.

11. Summary & discussion

Figure 11.1 presents an at-a-glance summary of the indicators presented within the case study. It is a (very crude) attempt to summarise 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 these two post-industrial regions: WCS and Northern Moravia.

Note that 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 'worse' to have poorer health; that it is 'better' high levels of educational attainment)[xxvii].

In presenting only cross-sectional data at the overall regional level, Figure 11.1 also omits some of important detail, particularly in relation to sub-regional analyses and trends. However, where possible, these have been described in detail in the preceding pages.

This Figure, and the case study generally, shows that there are a number of areas where clear differences exist between the regions. In summary:

- Male mortality rates, although currently slightly higher in Northern Moravia, are improving faster relative to WCS. Female mortality rates are lower, and improving faster.

[xxvii] 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 shown earlier in Figure 4.2, although female life expectancy is actually higher in Northern Moravia than in WCS, the 95% intervals for the Czech 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'.

- WCS generally compares favourably in economic terms e.g. lower unemployment, higher car ownership, better perceived adequacy of income.

- However, there is some evidence of greater within-region inequality in relation to income in WCS.

- Interesting differences emerge in relation to adults living alone: the percentage in this category is much higher in WCS.

- In terms of educational attainment, WCS has a relatively higher percentage of its adult population educated to tertiary level, but also a higher percentage with no educational qualifications at all.

- Alcohol harm is higher in WCS.

- Obesity and smoking levels are similar, with the exception of female smoking in WCS which is higher.

- Lone parent households are much more common in WCS.

- Other issues relating to maternal well-being compare poorly: numbers of infant deaths, teenage mothers, teenage abortions, and low birth-weight babies are all relatively higher in WCS.

- There is some evidence of greater area-based inequalities in WCS: this appears true in relation to mortality, and also with regard to some key indicators such as lone parent households, economic activity and aspects of educational attainment. However, these comparisons are constrained by the different geographical units of measurement in the Scottish and Czech region.

Figure 11.1 Summary 'spine chart' comparing WCS and Northern Moravia for key indicators

	Indicator	WCS Value	NM Value	Measure	Is WCS worse than, similar to, or better than Northern Moravia?	Time Period	WCS Region	NM Region	Fig
Key indicators summary for West Central Scotland compared to Northern Moravia									
Health & Function	Life expectancy - males	73.3	72.6	yrs	(similar)	2005-07	WCS	NM	4.1
	Life expectancy - females	78.8	79.6	yrs	(similar)	2005-07	WCS	NM	4.2
	Self-assessed health - 'good' or 'very good'	71.8	59.6	%	(better)	2008	GGC	NM	mr
	Adults with limiting long-term limiting illness	28.0	30.2	%	(similar)	2008	GGC	NM	mr
	Mean life satisfaction score	7.3	6.2	avg	(better)	2008	GGC	NM	mr
Prosperity & poverty	Male employment rate	73.8	68.3	%	(better)	2003-05	WCS	NM	5.6
	Female employment rate	63.5	51.5	%	(better)	2003-35	WCS	NM	5.7
	Unemployment rate	7.5	14.2	%	(better)	2001	WCS	NM	5.1
	Men aged 25-49 not in employment	21.7	17.0	%	(worse)	2001	WCS	NM	mr
	Perceived adequacy of income	11.4	42.9	%	(better)	2007	WCS	NM	5.12
	Economically active population	61.8	61.6	%	(similar)	2001	WCS	NM	5.8
Inequal-ities	Population living in relative poverty	18.9	9.5	%	(worse)	2003	SWS	NM	5.13
	Income inequality	0.30	0.28	Gini	(similar)	2003-04	WCS	M	mr
Social Environment	Lone parent households	28.5	22.2	%	(worse)	2001	WCS	NM	7.6
	Single person households	33.8	28.7	%	(worse)	2001	WCS	NM	7.8
	Adults (45-69) who are married	53.2	75.6	%	(worse)	2002-05	G	K/H	7.10
	Education: tertiary (level 5/6) qualifications	24.4	8.9	%	(better)	1999-01	Sclyde	NM	7.3
	Education: no qualifications	32.3	25.2	%	(worse)	1999-01	Sclyde	NM	7.1
	Social capital - club etc membership (45-69)	12.6	23.7	%	(worse)	2002-08	G	K/H	7.12
	Social capital - trust people in area (45-69)	67.5	52.6	%	(better)	2002-08	G	K/H	7.11
	Social capital - voter turnout	58.3	62.2	%	(similar)	2005-06	WCS	NM	7.15
Physical Environment	Climate - average annual irradiance	2460	2723	w	(worse)	2005	G	O	mr
	Overcrowding (rooms per head of pop)	2.0	1.1	cr	(better)	2001	WCS	NM	8.2
	Perception of neighbourhood safety	70.6	61.1	%	(better)	2007-08	WCS	NM	mr
Behaviour	Male smoking prevalence (45-69)	37.0	31.6	%	(similar)	2002-06	G	K/H	9.1
	Female smoking prevalence (45-69)	38.0	23.4	%	(worse)	2002-06	G	K/H	9.1
	Male obesity (45-69)	28.5	31.2	%	(similar)	2002-05	GG	K/H	9.3
	Female obesity (45-69)	30.3	34.9	%	(similar)	2002-05	GG	K/H	9.3
	Male liver cirrhosis mortality	46.3	36.7	sr	(worse)	2003-05	WCS	NM	2.6
	Female liver cirrhosis mortality	19.6	13.6	sr	(worse)	2003-05	WCS	NM	a/s
Child & Maternal	Births to teenage mothers	8.5	4.2	%	(worse)	2005-06	WCS	NM	mr
	Teenage terminations of pregnancy	2.1	0.9	%	(worse)	2005-07	WCS	NM	10.6
	Infant deaths	5.6	3.8	cr2	(worse)	2003-05	WCS	NM	10.1
	Low birth-weight babies	7.5	6.7	%	(similar)	2005-07	WCS	NM	10.2

Key: Measures – 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); cr2: crude rate per 1,000 live births. Regions – WCS: West Central Scotland; GGC: Greater Glasgow & Clyde; GG: Greater Glasgow; SWS: South West Scotland; G: Glasgow; Sclyde: Strathclyde; NM: Northern Moravia; M: Moravskoslezský; K/H: Karviná & Havirov; O: Ostrava. Figures – mr: presented in main report; a/s: presented in first 'Aftershock' report.Note that in many cases (for the sake of consistency) data are quoted for all of Northern Moravia even though the relevant Figure in the report presents the data separately for Moravskoslezský and Olomoucký.

In conclusion, we return to the two research questions posed at the beginning of this case study:

1. Can WCS's relatively slower rate of health improvement be explained purely in terms of socio-economic factors?
2. Do comparisons of other health determinant information identify important differences between WCS and this post-industrial region of the Czech Republic?

The answer to the first question would appear to be *no.* In absolute terms WCS and its regions appear to have a better economic profile than Northern Moravia. However, there is some limited evidence of greater income inequality in WCS compared to the Czech region, and this may be an important factor.

The answer to the second is *yes*. This is true especially in relation to particular types of households (lone parents, adults living alone), and particularly true of aspects of child and maternal health.

The concluding remarks made in the main report apply here. We have identified some important differences in WCS compared to Northern Moravia, but it is difficult to quantify their impact on health outcomes, or on the rate of improvement in health outcomes. However, these results add to the evidence that economic issues alone do not appear to be the principal issue. Further research is required, focussing not on routine administrative data, but based on the collation of new data to test specific hypotheses – and this is now being undertaken as part of a programme of work focussing on the key WCS city, Glasgow, and its most comparable post-industrial cities in the UK, Liverpool and Manchester. The results of that research will be available in 2012.

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Appendix 1

Figure(s)	Description	Source	Notes & definitions
2.1	Map of the region	Created using boundaries provided with ESRI ArcGIS software	
2.2-2.9	Mortality trends for specific causes of death, West Central Scotland (WCS) and Northern Moravia (NM), 1991-2005.	Calculated from mortality and population data from GRO(S) (WCS) and the Institute of Health Information & Statistics of Czech Republic (NM). Extracted from the first 'Aftershock of Deindustrialisation' analyses and report.	Data presented as European aged standardised rates (EASRs) i.e. directly standardised to the European standard population. ICD codes for individual causes of death are listed in Appendix 3 of the first 'Aftershock' report.
3.1	Age structure of HAPIEE study sample of Havirov and Karviná (2002-05) compared to published population estimates for residents of Glasgow City (2001), aged 45-69.	HAPIEE study; General Register Office of Scotland (GRO(S))[xxviii] 2001 mid-year estimates.	
3.2	Total population of N. Moravian districts (*okresy*) and WCS CHP areas, 2007.	Czech Statistical Office; GRO(S).	

[xxviii] Note that since the start of this study, the General Register Office for Scotland (GRO(S)) has been renamed National Records of Scotland.

Figure(s)	Description	Source	Notes & definitions
4.1-4.8	Trends in male and female life expectancy, WCS (including selected local authority areas) and NM (including selected *okresy*), 1982-2007	Calculated from population and mortality data from GRO(S) and the Czech Statistical Office	Estimates calculated using Chiang (II) methodology for individual years, and presented as three year rolling averages.
4.9-4.10	Trends in male and female life expectancy, Scotland and the Czech Republic, 1974-2007.	ScotPHO: Scotland & European Health for All (HfA) Database	See www.scotpho.org.uk for details of definitions and sources..
4.11	Self rated health, ages 45-69, Havirov and Karviná (2002-05) and Glasgow City, (2008)	HAPIEE study; NHS Greater Glasgow & Clyde (NHSGGC) Health & Wellbeing Survey	Survey question in Czech study: 'Over the last 12 months, would you say your health has been: very good; good; average; poor; very poor'. Question in NHSGGC survey: 'How would you describe your health over the past year: excellent; good; fair; poor'. Data were combined as: 'very good/good' (HAPIEE) and 'excellent/good' (NHSGGC); and 'poor/very poor' (HAPIEE) and 'poor' (NHSGGC).

Figure(s)	Description	Source	Notes & definitions
5.1-5.2	Unemployment rates, 2001	GRO(S) and Czech Statistical Office (Scottish and Czech census data).	Defined as number of unemployed adults as a percentage of the economically active population. Czech data are for adults defined as aged 15+; Scottish data are for adults aged 16-74. Additional analyses showed that these differences do not impact greatly on the results shown.
5.3	Numbers of job applicants in NM, shown as percentage of working age population, 1991-2008	Czech Statistical Office	'Working age' defined as 15-64 for males, and 15-60 for females. Note that this is approximate as retirement age in the Czech Republic can be affected by the type of employment and, in the case of females, the number of children (e.g. women with 3 children can retire earlier than women with 2 children)

Figure(s)	Description	Source	Notes & definitions
5.4	Unemployment rates, S.W. Scotland and Northern Moravia, 1993-2008	Data for 1997-2008 from Eurostat. Data for earlier period from: Overman HG, Puga D. Unemployment clusters across Europe's regions and countries, published in Economic Policy 34, April 2002: 115-147.	Data show total numbers of unemployed adults (based on ILO definition) as percentage of the economically active adult population aged 15+ in each period. Data are shown as three year rolling averages. S.W. Scotland used as proxy for WCS (see main report for discussion of principal geographies used in the project).
5.5.	Rates of unemployment within Moravskoslezský, 2005 and 2009	Professor Igor Ivan, Technical Institute of Ostrava.	Further details available on request.
5.6-5.7	Crude employment rates, WCS and NM, 1993-2005, ages 15-64	Calculated from data from: Labour Force Survey and GRO(S) for WCS; CSSR Yearbooks and Czech Labour Force Survey for NM.	Total number of employed adults aged 15-64, expressed as a percentage of the total population of same age group.

Figure(s)	Description	Source	Notes & definitions
5.8-5.9	Economically active population	GRO(S) and Czech Statistical Office (Scottish and Czech census data)	Total number of economically active adults, expressed as a percentage of total population of same age group. For NM, adults are defined as 15+ in all periods; for WCS, numerator and denominator in 1981 and 1991 were adults aged 16+, but in 2001 the 16-74 age group was used. However, comparative analyses show this to have no impact on difference in rates. However, there are a number of other differences in the definitions of 'economically active' in the two countries: for example in the Czech Republic the category includes those in prison, and those undertaking military service. However, such differences are unlikely to impact on the data presented to any great degree.
5.10-5.11	Percentage of households with no access to a car, 2001	GRO(S) and Czech Statistical Office (Scottish and Czech census data).	Scottish census question ask about cars or vans. Census only asks about the number of cars.

Figure(s)	Description	Source	Notes & definitions
5.12	Perceived adequacy of household income: percentage of adults reporting that it is difficult/very difficult 'to manage on household income nowadays', 2002-07.	Scottish Social Attitudes Survey 2007 (for WCS); European Social Survey (rounds 1 to 4 – 2002, 2004, 2006, 2008) (for NM).	For WCS adults defined as 18+; for NM adults defined as 15+.
5.13	Percentage of population living in relative poverty: 1994-2001	Data for both regions published in: Lemmi et al. Regional Indicators to reflect social exclusion and poverty VT/2003/43. Final Report. Brussels: European Commission; 2003	Estimated percentage of people in each region with an equivalised disposable income below 60% of the national median equivalised disposable income.

Moravskoslezský region used as proxy for N. Moravia. South Western Scotland used as a proxy for WCS. |
6.1	Fertility rates, 1980-2007	Calculated from data from ISD Scotland and Czech Statistical Office	Fertility rate defined as number of live births per 100 females aged 15-44
6.2	Total numbers of births and deaths 1982-2007	GRO(S); Czech Statistical Office	
6.3	Population trends (total population, and by selected age group), 1980-2007	GRO(S); Czech Statistical Office	

Figure(s)	Description	Source	Notes & definitions
6.4-6.5	Population age breakdown, 1982 and 2007	GRO(S); Czech Statistical Office	
6.6	Dependency ratio, 1982-2005	Calculated from data from GRO(S) and Czech Statistical Office	Dependency ratio calculated as population aged 0-14 and 65+ divided by the population aged 15-64 (and multiplied by 100)
6.7-6.8	Population density, 2007	Calculated from data from GRO(S) and Czech Statistical Office	Defined as number of persons per square kilometre

Figure(s)	Description	Source	Notes & definitions
7.1-7.2	Percentage of the adult (15+) population with no educational qualifications, 1980-2001.	Czech Statistical Office (NM); Labour Force Survey (Strathclyde – Figure 7.1); GRO(S) census data (WCS – Figure 7.2)	Data from both sources mapped to ISCED (International Standard Classification of Education) categories. 'No qualifications' defined by ISCED levels 0-2. For NM, census categories of 'no education' and 'basic education' and 'uncompleted basic education' were used. For Scottish data ISCED 0-2 equates to 'No qualifications' to NVQ Level 1. For NM, adult population defined as age 15+ in both Figures. Adult population for Strathclyde (Figure 7.1) defined as 16+. Adult population for WCS local authority areas (Figure 7.2) defined as 16-74. This may slightly inflate the figures for N. Moravian compared to WCS areas. Labour Force Survey data used for trend line in Figure 7.1 because of lack of availability of 1991 data from the census. Strathclyde used as proxy for WCS in Figure 7.1.

Figure(s)	Description	Source	Notes & definitions
7.3-7.4	Percentage of adults with tertiary level qualifications, 1980-2004	Czech Statistical Office for NM; Labour Force Survey for Strathclyde (Figure 7.3); Annual Population Survey (APS) for WCS local authority areas (Figure 7.4)	Tertiary level qualifications defined as ISCED levels 5-6. For N. Moravia this included census categories of: higher professional schools; bachelor programmes; university education; doctoral programmes. For WCS this relates to NVQ Level 4+ for WCS. For NM, adult population defined as age 15+ in both Figures. Adult population for Strathclyde (Figure 7.3) defined as 16+. However, the adult population for WCS local authority areas in Figure 7.4 was defined as 16-64. This is likely to inflate the figures for the Scottish areas. Comparative analysis of APS 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%). Strathclyde used as proxy for WCS in Figure 7.4.

Figure(s)	Description	Source	Notes & definitions
7.5	Percentage of 45-69 year-olds with university level education, Havirov and Karviná (NM) and Glasgow, 2002/05 and 2001.	HAPIEE study; GRO(S) Scottish census data	HAPIEE data based on survey question: 'What is your highest completed level of education?', with those selecting 'university (degree)' option included. Data extracted from census by GRO(S) for residents of Glasgow in same age group with 'first degree' or 'higher degree' qualifications only.

Figure(s)	Description	Source	Notes & definitions
6-7.7	Lone parent households with dependent children, 1991-2001	GRO(S) and Czech Statistical Office (Scottish and Czech census data)	Total number of lone parent households with dependent children expressed as a percentage of all households with dependent children. Note that the definition of a 'dependent' child differs between the Czech Republic and Scotland. In the Czech census a dependent child is defined as 'any person whose relation to the census household head is son or daughter, is economically inactive, and is 0-25 years of age'; in the Scottish census a dependent child is 'a person in a household aged 0 to 15 (whether or not in a family) or a person aged 16 to 18 who is a full-time student in a family with parent(s)'. Thus, comparison of data for these two definitions is likely to overestimate the figure for NM in comparison to WCS.
7.8-7.9	Single person households, 1980-2001	GRO(S) and Czech Statistical Office (Scottish and Czech census data)	Total number of single person households expressed as a percentage of all households.

Figure(s)	Description	Source	Notes & definitions
7.10	Marital status among 45-69 year-olds, Havirov and Karviná (NM) and Glasgow, 2002/05 and 2001	HAPIEE study; GRO(S) Scottish census data	
7.11	Social capital: % of 45-69 year-olds who say they can trust people in their local area, Havirov and Karviná (NM) and Glasgow, 2002/05 and 2001	HAPIEE study; NHS Greater Glasgow & Clyde Health & Wellbeing Survey	Note the slight differences in the two survey questions: the HAPIEE questionnaire asks, 'Is there trust among people in your area of residence?' (with options of: always, mostly, sometimes, rarely, never) while the Scottish survey asks, 'Generally speaking, you can trust people in my local area' (with options of: strongly agree, agree, neither agree nor disagree, strongly disagree). The different wording may lead to a slightly different interpretation of the question on the part of the survey respondents in the two regions.

Figure(s)	Description	Source	Notes & definitions
7.12	Social capital: % of 45-69 year-olds who are members of clubs, organisation etc., Havirov and Karviná (NM) and Glasgow, 2002/05 and 2001	HAPIEE study; NHS Greater Glasgow & Clyde Health & Wellbeing Survey	Note the slight differences in the two survey questions: the HAPIEE questionnaire asks, 'Are you a member of club or organisation (sports club, church, political party)?', while the Scottish survey asks, 'Do you belong to any social clubs, associations, church groups or anything similar?'
7.13-7.14	% of the population with no religious affiliation, 2001	GRO(S) and Czech Statistical Office (Scottish and Czech census data)	Czech census question had two options: 'without denomination' and 'believer'; Scottish question contains many more options including 'none'.

Figure(s)	Description	Source	Notes & definitions
7.15-7.16	Electoral turnout: Czech Parliament & UK Westminster elections, N. Moravia and WCS, 1987/90 - 2006	Czech Statistical Office (NM); Scottish 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).	Czech data based on Election to the Chamber of Deputies of the Parliament of the Czech Republic for elections of 1990, 1992, 1996, 1998, 2002 and 2006. Scottish data are from elections to the Westminster parliament of 1987, 1992, 1997, 2001 and 2005 to WCS constituencies. A full list of the constituencies used in the analyses are available on request.
8.1	Climate: average daily irradiation by month, 2005, Ostrava and Glasgow	Solar Radiation Data website[xxix]	Daily irradiance, measured in watt-hours per square metre (Wh/m2), averaged over 12 months, January-December 2005. Irradiation is the power received per area, measured in watt-hours per square metre (Wh/m2).
8.2	Overcrowding: rooms per head of population, 2001, NM and WCS.	GRO(S) and Czech Statistical Office (Scottish and Czech census data)	Measure calculated as the total number of rooms in private dwellings divided by the total number of residents in region. As mentioned in the text, this is an extremely crude measure of overcrowding.

[xxix] www.soda-is.com/eng/services/services_radiation_free_eng.php

Figure(s)	Description	Source	Notes & definitions
8.3	Perception of safety at night among 45-69 year-olds, Havirov and Karviná (NM) and Glasgow, 2002/05 and 2005/06	HAPIEE study; Scottish Household Survey	Note that the analysis is based on two slightly different questions: the HAPIEE questionnaire asks, 'Do you feel safe in the area of your residence at night?', with answers of 'always' and 'mostly' shown; the Scottish Household Survey asks, 'How safe do you feel walking alone in your neighbourhood after dark?' with answers of 'very safe' and 'fairly safe' included.
8.4	Crime: ascertained offences, N. Moravia, 1991-2008	Czech Police of the Czech Republic	Data shown as crude rates per 1,000 population (three year rolling averages). 'Ascertained offences' include economic crimes and other (general) offences. Economic crimes include mainly offences in trade and financial relations. Other offences include offences of violence, offences against morality and against property, frauds and other property and other criminal acts.
8.5	Total number of crimes recorded by the police, Scotland and WCS, 1990-2007	Justice Analytical Services, Scottish Government	Total number of crimes, expressed as a crude rate per 1,000 total population (three year rolling averages).

Figure(s)	Description	Source	Notes & definitions
9.1	Smoking prevalence among 45-69 year-olds, Havirov and Karviná (NM) (2002-05) and Glasgow (2005-06).	HAPIEE study; Scottish Household Survey	
9.2	Problem drinking among 45-69 year-olds, Havirov and Karviná (NM) (2002-05) and greater Glasgow (2003).	HAPIEE study; Scottish Health Survey	Problem drinking defined as a score of 2+ on the CAGE survey questionnaire tool. The four 'CAGE' questions are: 1) Have you ever felt you needed to **C**ut down on your drinking?; 2) Have people **A**nnoyed you by criticizing your drinking?; 3) Have you ever felt **G**uilty about drinking?; 4) Have you ever felt you needed a drink first thing in the morning (**E**ye-opener) to steady your nerves or to get rid of a hangover?
9.3	Obesity: percentage of 45-69 year-olds classed as obese, Havirov and Karviná (NM) (2002-05) and greater Glasgow (2003).	HAPIEE study; Scottish Health Survey	Obesity defined as having a BMI (Body Mass Index) of 30 or more. BMI is calculated as weight (in kg) divided by height (in metres)^2.

Figure(s)	Description	Source	Notes & definitions
10.1	Infant mortality rates 1995-2005, NM and WCS	Calculated from mortality and population data from GRO(S) and the Institute of Health Information & Statistics of Czech Republic. Extracted from the first 'Aftershock of Deindustrialisation' analyses and report.	Total number of deaths under the age of 1, expressed as a crude rate per 1,000 live births (3 year rolling averages)
10.2-10.3	Low birth-weight babies	Czech Statistical Office (NM); ISD Scotland (WCS)	Total number of all live births of low birth-weight (<2,500g), expressed as a percentage of all live births (3 year rolling averages)

Figure(s)	Description	Source	Notes & definitions
10.4-10.5	Terminations of pregnancy, 1980-2007	Czech Statistical Office (NM); ISD Scotland, from notifications (to the Chief Medical Officer for Scotland) of abortions performed under the Abortion Act 1967 (WCS).	Total number of terminations, expressed as a crude rate per females aged 15-44. There are a number of differences in UK and Czech law relating to the conditions under which requests for abortions can be granted: in the Czech Republic the gestational limit is 12 weeks, whereas in the UK terminations are legally allowed up to 24 weeks. Grounds on which abortion can be permitted in the Czech Republic: to save the life of the woman; to preserve physical health; to preserve mental health; rape or incest; foetal impairment; economic or social reasons; available on request. In the UK abortions are not available automatically 'on request'; nor does the 'rape or incest' criterion apply. However, the other grounds listed above (to save the life of the woman; to preserve physical health; to preserve mental health; foetal impairment; economic or social reasons) also apply to the UK.

Figure(s)	Description	Source	Notes & definitions
10.6-10.7	Teenage terminations of pregnancy, 1980-2007	See above	Total number of terminations among females aged 13-19, expressed as a percentage of 15-19 year-olds. In addition, see notes relating to figures 10.4-10.5 above

Limburg

Merseyside

Nord-Pas-de-Calais

Northern Ireland

North Moravia

Ruhr

Saxony

Saxony-Anhalt

Silesia

Swansea & South
Wales Coalfields

Wallonia

West Central Scotland