



**Investigating a ‘Glasgow
Effect’: why do equally
deprived UK cities
experience different
health outcomes?**

KEY FINDINGS

- This report summarises a range of analyses undertaken to investigate the so-called ‘Glasgow Effect’, a term used in recent years to describe the higher levels of mortality and poor health experienced in Glasgow over and above that explained by its socio-economic profile.
- The aims of the research were to establish whether there is evidence of such an ‘effect’, even when comparing Glasgow to its two most similar and comparable UK cities: Liverpool and Manchester.
- The analyses were based on the creation of a three-city deprivation index, and the calculation of a series of standardised mortality ratios (SMRs) for Glasgow relative to Liverpool and Manchester. A range of historical census and mortality data were also analysed.
- The results showed that the current deprivation profiles of Glasgow, Liverpool and Manchester are almost identical.
- Despite this, premature deaths in Glasgow for the period 2003-2007 were more than 30% higher than in Liverpool and Manchester, with all deaths around 15% higher.
- This ‘excess’ mortality was seen across virtually the whole population: all ages (except the very young), both males and females, in deprived and non-deprived neighbourhoods.
- For premature mortality, SMRs tended to be higher for the more deprived areas (particularly among males), and around a half of ‘excess’ deaths under 65 were directly related to alcohol and drugs.
- Analyses of historical data suggest it is unlikely that the deprivation profile of Glasgow has changed significantly relative to Liverpool and Manchester in recent decades; however, the mortality gap appears to have widened in the last 30 years, indicating that the ‘effect’ may be a relatively recent phenomenon.
- The results emphasise that while deprivation is a fundamental determinant of health and, therefore, an important driver of mortality, it is only one part of a complex picture. As currently measured, deprivation does not explain the higher levels of mortality experienced by Glasgow in relation to two very similar UK cities. Additional explanations are required.
- This research, in particular the creation of the small area based three-city deprivation measure, has allowed identification of communities in Glasgow which, although almost identical to similar sized areas in Liverpool and Manchester in terms of their socio-economic characteristics, have significantly poorer health outcomes. These will now be the focus for a second, qualitative, phase of research.

INTRODUCTION

The link between socio-economic circumstances and health is well established. However, the extent to which the poor health profile of Scotland – the nation with the highest mortality rates and lowest life expectancy in western Europe – can be explained in terms of socio-economic factors is less clear. Historically, Scotland's unenviable position in being what the press has labelled 'The Sick Man of Europe' has been attributed almost exclusively to its relatively high levels of socio-economic deprivation, principally in comparison to England and Wales. However, a number of publications over the past five years have highlighted a phenomenon speculatively entitled the 'Scottish Effect', a term used to describe the country's higher levels of morbidity and mortality *over and above* that explained by deprivation. One such analysis showed this 'Scottish Effect' to exist in all geographical regions of Scotland and at all levels of deprivation, but that it was most evident in the most deprived post industrial region of West Central Scotland, with Glasgow at the region's core. This led to talk of a 'Glasgow Effect', a notion reinforced by other recent research showing that mortality in the former industrial areas of West Central Scotland was higher, and was improving more slowly, than in the vast majority of other, similar, post-industrial regions of Europe, including those which currently experience worse socio-economic conditions.

Within a UK context, however, Glasgow is not alone in experiencing relatively high levels of poor health and deprivation. Liverpool and Manchester are two other cities which stand out in this regard, with high levels of poverty and the lowest life expectancy of all cities in England. The approach taken in this project, therefore, was to investigate this 'Scottish Effect' or 'Glasgow Effect' by looking in detail at the three cities of Liverpool, Manchester and Glasgow, cities which share similar histories of industrialisation and deindustrialisation, and which have high mortality associated with known problems of deprivation. Furthermore, we sought to improve on previous related analyses by employing a more up to date and spatially sensitive measure of deprivation than was previously available to researchersⁱ.

ⁱ Previous analyses were based on the Carstairs & Morris index, a composite measure of deprivation calculated from census data. This measure is now out of date (the most recent data being for 2001), but crucially was also calculated for different-sized geographies north and south of the border: the relatively large size of these areas (especially in the two English cities), and the variation in size between the Scottish and English geographies is potentially problematic in measuring the effects of area-based deprivation.

AIMS & PURPOSE

Given all the above, this research sought to answer the question “is there evidence of a so-called ‘Glasgow effect?’”:

1. even when based on comparisons with its two most similar and comparable UK cities?
2. and when based on a more robust and spatially sensitive measure of deprivation than that previously available to researchers?

In addition, the study aimed to lay the foundation for a second, qualitative, phase of research by creating a means of identifying communities in Glasgow which experience significantly different health outcomes compared to identically deprived communities in Liverpool and Manchester.

APPROACHES & METHODS

Data were assembled for the populations of the three cities: Glasgow, Manchester and Liverpool. ‘Income deprivation’ (a measure of the proportion of the population in receipt of key income-related benefits, as well as children dependent on adult recipients of those benefits) was calculated for similarly-sized small areas in each city (average population: 1,600). Importantly, this measure of deprivation was shown to be a very good proxy for multiple deprivation, as currently measured across Scotland and England.

Detailed mortality and population data were obtained from national statistical agencies. A series of standardised mortality ratios (SMRs) were calculated for Glasgow relative to Liverpool and Manchester, standardising for age, sex and income deprivation decile. A range of historical census, population and mortality data were also analysed.

FINDINGS & CONCLUSIONS

Deprivation profiles

- The overall levels of deprivation in Glasgow, Liverpool and Manchester were almost identical, with almost a quarter of the total population in each classed as income deprived: 24.8%, 24.6% and 23.4% respectively. The distribution of deprivation across each city's small areas was also almost identical with the ratio of most deprived/least deprived decile in each city being: 9.7, 10.0 and 10.1 respectively. The above is summarised in Figure 1.

Mortality analyses

- Despite these near identical deprivation profiles, all-cause premature mortality (deaths under 65) in Glasgow relative to Liverpool and Manchester was more than 30% higher. For all deaths, mortality in Glasgow was 14% higher. 'Excess' mortality was greatest in the working-age groups of 15-44 and 45-64, where it was 45% and 30% higher respectively. However, childhood (age 0-15) mortality was significantly lower in Glasgow relative to Liverpool and Manchester. Across most age groups, SMRs were highest for comparisons of deaths among males. All these findings are presented (with full SMRs and 95% confidence intervals) in Table 1.
- SMRs were also calculated for each deprivation decile of the three cities (Figure 2). For all deaths, 'excess' mortality for Glasgow relative to Liverpool/Manchester was seen across the whole population: for example mortality was 18% higher in the most deprived decile (decile 10), but also 15% higher in the least deprived decile (decile 1). For premature mortality (deaths <65 years), SMRs tended to be higher in the more deprived deciles. SMRs were generally higher for males.
- A number of causes of death were analysed. SMRs for the more common causes of death (all cancers; diseases of the circulatory system (a grouping which includes heart disease and stroke)) were similar to the SMRs calculated for all deaths. However, notably higher SMRs were evident for other causes: deaths among Glaswegians (relative to residents of Liverpool and Manchester) were 27% higher in relation to lung cancer, 32% higher for external causes, almost 70% higher for suicide, 2.3 times higher for alcohol-related causes, and almost 2.5 times higher for drug-related poisonings. These findings are shown in Figure 3.
- 'Excess mortality' in these analyses can be defined as the additional deaths experienced in Glasgow over and above what might be expected if Glasgow displayed the same age, sex and deprivation specific mortality profile as Liverpool and Manchester. On that basis, between 2003 and 2007 there were more than 4,500 'excess' deaths in Glasgow, of which almost half (2,090) occurred under the age of 65 (with almost half of these due to deaths from alcohol related causes (32%) and drugs related poisonings (17%)).
- Analysis of long term trends in premature mortality for the three cities back to the 1920s suggests that the current situation (higher mortality rates in Glasgow compared to Liverpool and Manchester) has not always been the case. A widening gap (with rates in Glasgow improving more slowly than rates in the English cities) appears for the first time at the start of the 1980s, but has continued over the past 25-30 years. This might suggest that the 'excess' – the Glasgow Effect – is a relatively recent phenomenon.

Possible explanations

Preliminary explorations of a number of potential explanations for the findings were undertaken during the course of study. Relevant results included the following:

- Analysis of a range of historic data suggests that it is unlikely that any significant change in the relative deprivation status of the three cities has taken place which might account for the difference in mortality rates. For example, levels of poverty and unemployment in the three cities have been consistently similar over the past 40-50 years.
- As might be expected given the known close links between deprivation and important health behaviours, city level estimates of smoking, alcohol consumption, healthy eating and obesity showed very little difference between these three equally deprived cities. However, given the higher mortality rates for alcohol, drugs and lung cancer seen in Glasgow, this perhaps suggests an 'extreme' behavioural risk profile among some elements of the Glasgow population which is not identified from routine health surveys and prevalence data.
- Analyses of a range of other relevant data sets (e.g. educational attainment, teenage pregnancy, lone parent households) also showed very little difference between the cities.
- The results did not appear to be influenced by factors such as migration and population composition (ethnic and age breakdown of the cities' populations).

A number of potential explanations for the results have been suggested, ranging from 'downstream' health determinants to 'upstream' societal phenomena. These include: **artefact** (i.e. deprivation is still the cause, but we are not measuring/capturing it properly); **migration**; **genetics**; **health behaviours**; different **individual values**; **family, gender relations or parenting** differences; **inequalities**; concentrations of **deprivation**; lower **social capital**; **deindustrialisation**; **sectarianism**; different culture of **substance misuse**; culture of **boundlessness and alienation**; culture of **limited social mobility**; **political attack**; differences in **health service supply or demand**. The plausibility of, and evidence for, these potential explanations has been examined to inform the next phase of research aimed at investigating what lies behind the so called 'Glasgow Effect'. This work will be reported in a future GCPH report.

Overall conclusion and next steps

These results emphasise that while deprivation is a fundamental determinant of health and, therefore, an important driver of mortality, it is only one part of a complex picture. As currently measured, deprivation does not explain the higher levels of mortality experienced by Glasgow in relation to two very similar UK cities. Additional explanations are required.

These are now being investigated in detail through a second phase of research, including detailed comparisons of equally deprived areas in the three cities (and made possible by the development of the three-city deprivation measure described in the paper).

Figure 1

Distribution of 'income deprivation' across Glasgow, Liverpool and Manchester, showing the proportion of the total population in each of the cities' small areas classed as 'income deprived'

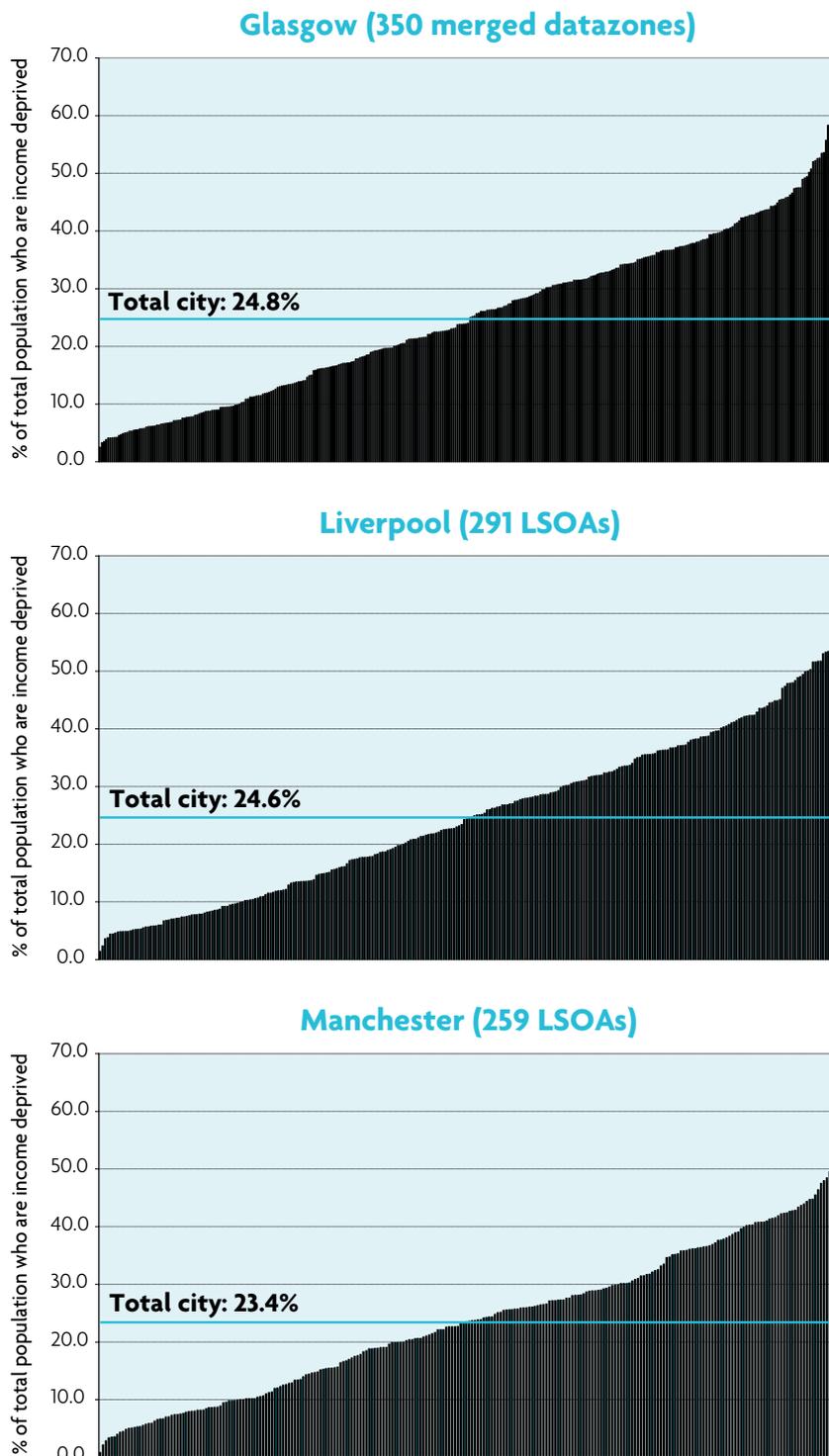


Table 1

Standardised all-cause mortality ratios 2003-2007 for Glasgow relative to Liverpool and Manchester (combined), indirectly standardised by five-year age band, sex, and income deprivation decile.

Age group	SMRs (95% confidence intervals)		
	Total population	Males	Females
All ages	114.4 (113.2 to 115.5)	122.4 (120.6 to 124.2)	107.7 (106.1 to 109.2)
Age <65 years	131.4 (128.6 to 134.1)	135.6 (132.0 to 139.1)	124.4 (120.0 to 128.8)
0-14 years	81.3 (71.2 to 91.3)	78.8 (65.8 to 91.7)	84.7 (68.9 to 100.5)
15-44 years	145.8 (139.5 to 152.0)	160.4 (152.1 to 168.6)	121.4 (112.1 to 130.7)
45-64 years	130.3 (127.1 to 133.5)	131.6 (127.5 to 135.7)	128.1 (122.9 to 133.3)
65+ years	109.8 (108.5 to 111.1)	117.0 (114.9 to 119.1)	104.8 (103.2 to 106.5)

Figure 2

Standardised all-cause mortality ratios 2003-2007 for Glasgow relative to Liverpool and Manchester (combined), broken down by deprivation decile, for (a) all deaths and (b) deaths under 65 years.

Calculated from various sources

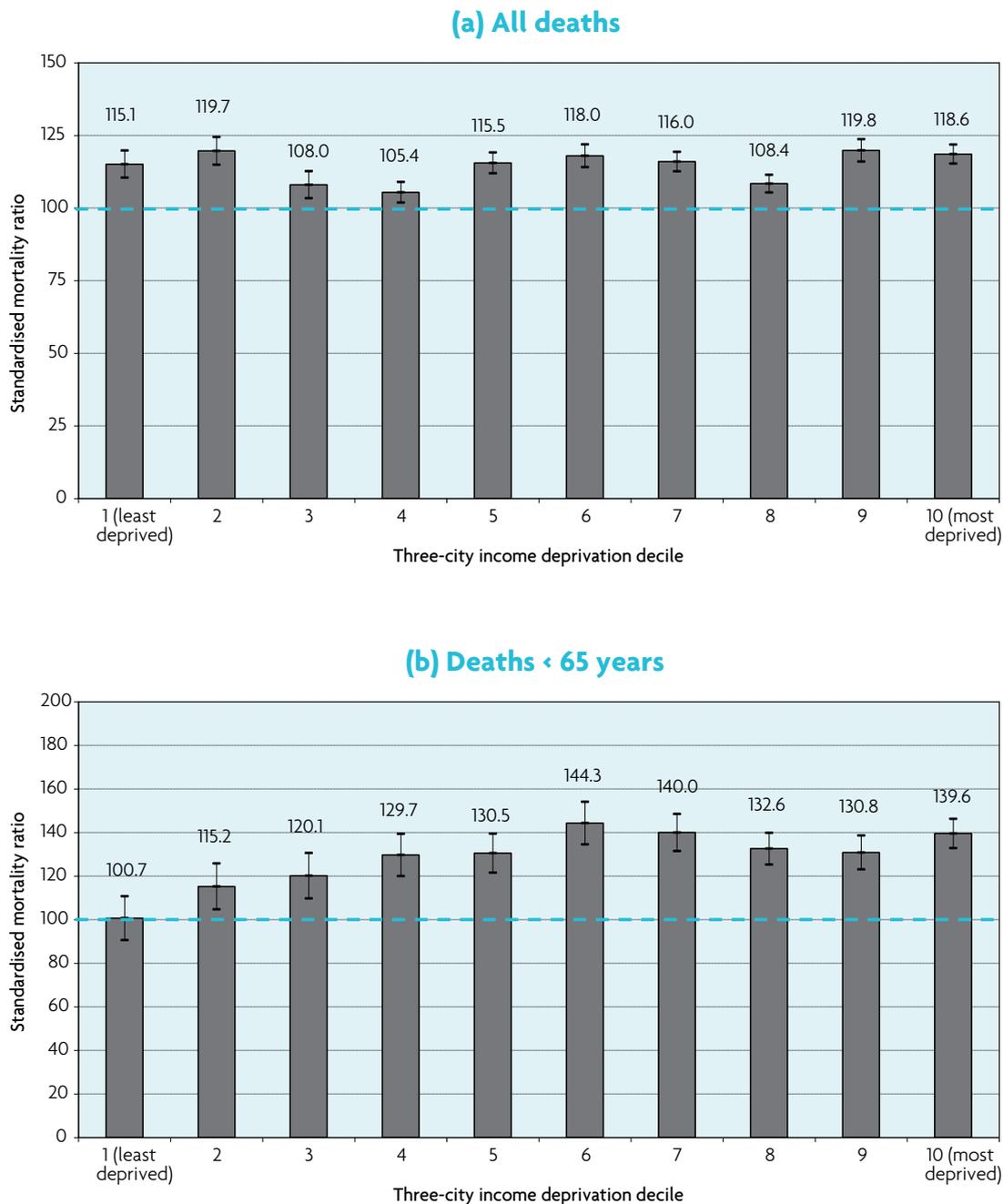
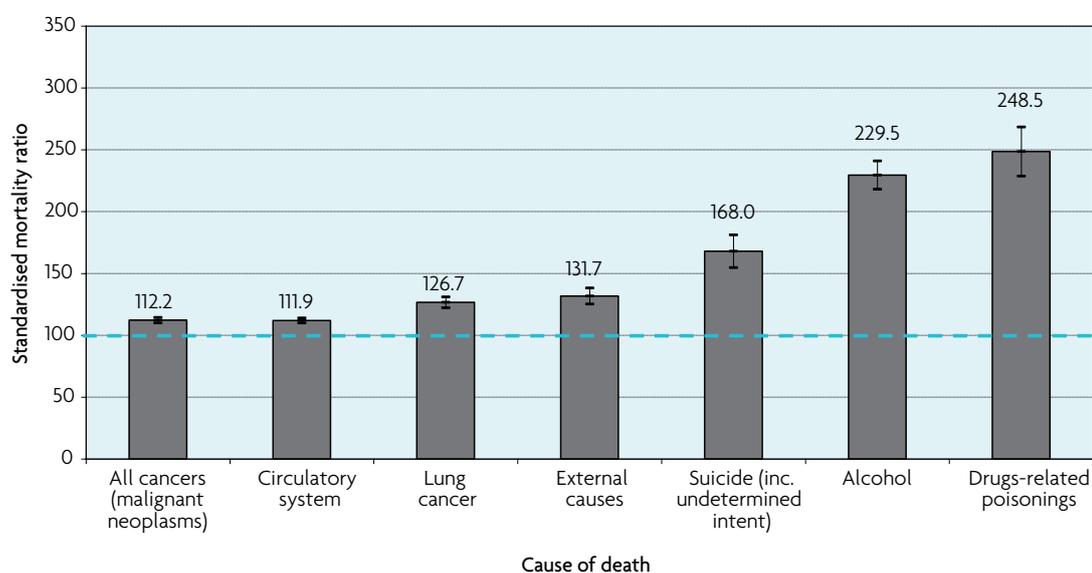


Figure 3

All ages, both sexes: cause-specific standardised mortality ratios 2003-07, Glasgow relative to Liverpool & Manchester, standardised by age, sex and deprivation decile

Calculated from various sources



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