Changes in health-related indicators in GoWell and other areas undergoing housing-led renewal between 2000/02 and 2010/12

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Contents

Summary

To provide background and context to the GoWell study, which is examining the impact of housing-led neighbourhood renewal programmes on health and wellbeing in Glasgow, a series of descriptive analyses of change in health-related indicators over a ten-year period (2000/02 to 2010/12) was undertaken.

To a degree, the analyses update those included within a 2008 GoWell report. Three broad groups of indicators were analysed: population size; maternity-related indicators (teenage pregnancy, breastfeeding, maternal smoking); and life expectancy and mortality (all-cause, and cause-specific mortality, including cancer, heart disease, stroke, alcohol- and drug-related deaths, suicide). Analyses were undertaken for GoWell study areas, GoWell area types, the 'GoWell East' area, and the other so-called 'Transformational Regeneration Areas' (TRAs) in Glasgow. Comparative analyses for Glasgow as a whole and Scotland were also included. Areas were defined by census-based geographical units in 2001 and 2011.

Improvements in a range of health-related indicators were observed in the various areas over the period. For outcomes such as mortality and life expectancy, rates of improvement tended to be broadly similar to those seen for Glasgow and Scotland. As a result, despite these improvements, rates remained high in most areas compared with Glasgow and Scotland: this was especially true of alcohol- and drug-related mortality.

For the majority of areas, improvements in the maternity-related indicators exceeded those observed at the national level and, for some specific areas, those also observed for Glasgow. However, in many cases, changes in those, and other, indicators were greatest in areas which have also experienced considerable change in population size, making interpretation of these limited trends problematic. It is not possible in these analyses to assess whether the changes in the population composition (rather than changes experienced by longstanding residents as a result of the interventions) account for the changes in the indicators. Furthermore, the nature of the analyses (ecological and cross-sectional), as well as issues relating to the timing and progress of the housing investment and regeneration processes, mean that the observed changes cannot be attributed to the neighbourhood renewal programmes.

These issues are at the heart of broader discussions concerning the extent to which housing-led regeneration is likely to impact on social and health inequalities in the city, and the methods needed to ascertain such impacts.

Acknowledgements

Grateful thanks are due to:

Background

GoWell is a ten-year research project seeking to investigate the impact of housing-led regeneration on individual and community health and wellbeing in Glasgow. As part of a regeneration programme spanning the city, 15 study areas were chosen for in-depth research. These areas have received, or were due to receive, different levels of regeneration investment, and on that basis were grouped into five corresponding area 'types'. These are: Transformational Regeneration Areas (TRAs), neighbourhoods characterised by substantial planned demolition and rebuilding; Local Regeneration Areas (LRAs), where more limited, and smaller-scale, restructuring is/was planned; Wider Surrounding Areas (WSAs), neighbourhoods adjacent to the TRAs and LRAs which are likely to be affected by the impact of regeneration in the latter, while also undergoing improvements themselves; Housing Improvement Areas (HIAs), in which substantial internal and external upgrading of dwellings was planned; and Peripheral Estates (PEs), two large-scale housing estates on the city boundary. Table 1 in the 'Methods' section of this report lists the individual areas under each of these categories.

Alongside these 15 areas, there is also interest in changes being made to a large section of the east end of the city, described in this report as 'GoWell East'[i], as well as five other TRAs which were not included in the original GoWell evaluation programme: the latter are included in this report under the heading of 'non-GoWell TRAs', and are also listed in Table 1.

People with lower socioeconomic status are more likely to live in neighbourhoods where environmental disadvantages are concentrated[1,2]. Health outcomes are poorer in such neighbourhoods than those with more affluent residents. Thus, by targeting these areas, area-based regeneration programmes have the potential to improve the health of those living in the poorest circumstances. However, at present there is limited evidence about the effects of largescale area-based regeneration programmes on health, and less is known about the impact on health inequalities[3-5]. Furthermore, it is possible that even though the overall health of the residents of these areas may improve on average, inequalities within the area may widen if the poorest households do not benefit equally or greater than those in better positions[6-8]. For this reason, analysis of changes in indicators of health and wellbeing in the study areas over the period of the GoWell research programme are of interest, and the programme provides an opportunity to explore changes in these indicators over time, and to use learning from other GoWell research to help interpret these.

A report published in 2008 summarised analyses of a range of health- and wellbeing-related indicators for the GoWell areas for a single period in the early 2000s[9], and we were interested in assessing changes in these areas over the subsequent years. However, it is important to state at the outset that any observed changes in the areas cannot be attributed to the effects of the housing-led regeneration and improvement programmes. This is for a number of reasons, including the following:

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[i] The GoWell East area comprises six relatively deprived communities in east Glasgow: Bridgeton; Calton; Camlachie; Dalmarnock; Gallowgate; and (part of) Parkhead. More information is available online at: http://www.gowellonline.com/goeast

- The nature of the analyses themselves (cross-sectional and ecological) prevent any causal attribution[ii].
- Although the study has now exceeded the initial ten-year time frame, delays to the regeneration programmes (principally in relation to demolition, clearance and rebuilding) mean that in a number of important areas, the interventions are not yet complete.
- As described in the Methods section, the period of analysis has had to be restricted to a comparison between 2000/02 and 2010/12: however, the majority of the interventions of interest did not commence until at least 2006[10].
- Many of the indicators analysed (e.g. life expectancy, many causes of death) are likely to be influenced by a range of important health determinants that accrue and interact over the whole life-course rather than over four or five years.

These, and related, points are discussed further later in the report.

[ii] To attribute any identified changes in, for example, health over time to the effects of a housing intervention, individual, longitudinal data would be required whereby the same individuals were followed over time, controlling for a range of other influences on health (e.g. socioeconomic circumstances, previous medical history, behavioural factors), alongside housing information. The data on which the analyses in this report are based are ecological (not individual) and cross-sectional (not longitudinal), meaning that it is difficult to reach any conclusions about causality.

Aims

Given the limitations described above, analyses were undertaken to provide a purely descriptive overview of change in health-related factors in the various areas where housing and regeneration interventions have taken (or are still taking) place. The aim is to furnish other components of the GoWell research programme with useful contextual information, bearing in mind that one of the stated objectives of the study is to monitor 'the effects of regeneration policy on area-based health and social inequalities across Glasgow'[11].

This report provides a summary of an extensive range of analyses of health-related indicators for GoWell areas and other areas undergoing regeneration in Glasgow, in comparison with the city as a whole and Scotland. Data are aggregated for two three-year periods around the last two censuses (i.e. for 2000/02 and 2010/12).

To a degree, this updates some of the analyses published in 2008. However, it should be noted that the results presented here are generally based on different time periods, geographical boundaries and other definitions, and thus in most cases are not directly comparable[iii].

[iii] Important methodological differences between the two sets of analyses (which make comparisons difficult) include: different population denominator data (as discussed further in the Methods section of this report); different geographical boundaries (as also stated in the Methods section, the analyses presented in this report are based on areas defined by 2001 and 2011 Census output areas to enable the use of more accurate census population denominator data); a different 'standard' population for use in calculating standardised mortality rates which produces quite different values to those based on the previous standard population (the World Health Organization (WHO) updated its standard population in 2013); different time periods (as is described in the Methods section, the analyses presented in this report are based on three-year periods around the census year i.e. 2000-2002 and 2010-2012, whereas the analyses published in 2008 were primarily undertaken for the period 2001-2005).

Methods

Indicators

The set of indicators to be analysed was agreed in advance, and is a subset of those included in the 2008 report. The indicators were as follows:

- Population size.

- Breastfeeding (at 6-8 weeks).

- Teenage pregnancies.

- Maternal smoking (recorded at first Health Visitor visit).

- Life expectancy at birth.

- All-cause mortality (all ages, age 0-64 years, males and females, and calculated as European age-standardised rates per 100,000 population).

- Cause-specific mortality (all ages, age 0-64 years, males and females, and calculated as European age-standardised rates per 100,000 population) for the following causes:

  o All cancer.

  o Lung cancer.

  o Diseases of the circulatory system (including, separately, ischaemic heart disease and cerebrovascular disease).

  o Alcohol-related deaths.

  o Drug-related poisonings.

  o All external causes.

  o Suicide.

Note: full definitions (including, for example, ICD codes for all causes of death) are available on request. Where appropriate and potentially helpful, some definitions are clarified within the Results section of this paper.

Areas

Analyses were undertaken for:

- each of the 15 GoWell study areas
- all GoWell area types (Transformational Regeneration Areas (TRAs); Local Regeneration Areas (LRAs); Wider Surrounding Areas (WSAs); Housing Improvement Areas (HIAs); Peripheral Estates (PEs))
- GoWell East area
- non-GoWell TRAs (Gallowgate, Govan/Ibrox, Laurieston, Maryhill, North Toryglen)
- Glasgow City
- Scotland.

The full list of areas, and their corresponding area type, is listed in Table 1 below.

Table 1.

Area type	Individual areas
Housing Improvement Areas (HIAs)	Birness Drive Carntyne Govan Riddrie Townhead multi-storey flats (MSFs)
Local Regeneration Areas (LRAs)	Gorbals Riverside Scotstoun core St Andrews Drive
Peripheral Estates (PEs)	Castlemilk Drumchapel
Transformational Regeneration Areas (TRAs)	Red Road core Shawbridge Sighthill
Wider Surrounding Areas (WSAs)	Red Road surround Scotstoun surround
Non-GoWell TRAs	Gallowgate Govan/Ibrox Laurieston Maryhill North Toryglen

NB It is important to note that although the analyses were undertaken at all the levels listed above, in the vast majority of cases results are **not** presented here at individual area level (GoWell study area, or the other TRAs). This is because of the small population sizes of many of these areas and the frequently very small number of 'events' (e.g. deaths from a particular cause) which took place in the time periods that were analysed. Both these factors make interpretation of changes over time at this level extremely problematic, and the presentation of potentially identifiable cases unethical.

Geographical definitions of areas

All areas were defined by sets of census output areas for 2001 and 2011. This was to ensure that the most accurate population denominator data from the censuses could be used: the previous analyses published in 2008 used population data from the Community Health Index (CHI), but the level of population change experienced recently in many regeneration areas have rendered these data unreliable. The output areas (the smallest geographical unit at which census data are made available) were mapped to the GoWell and other areas using Geographical Information System software (GIS).

Time periods

As stated, population data were obtained from the 2001 and 2011 Censuses. All other data were aggregated over three-year periods around those time points (i.e. 2000-2002 and 2010-2012).

Statistical presentation and significance

For the most part, the figures shown have been calculated as percentages (e.g. the percentage of mothers breastfeeding), years of expected life, and standardised mortality rates. In all those cases, 95% confidence intervals are also shown as an indication of levels of uncertainty associated with the accuracy of these types of statistics. Generally speaking, the smaller the population size and number of events (e.g. deaths), the greater the level of uncertainty, and the wider the 95% confidence intervals.

No formal statistical testing of differences between rates between the two time points was undertaken. However, for simplicity and readability, this report uses the term 'significant' to describe differences between values that appear meaningful in a statistical sense i.e. simply where two sets of 95% confidence intervals around the rates or percentages do not overlap[iv].

Further details of all the above methodological details are available on request.

[iv] It should be noted, however – as many statisticians would point out – that non-overlapping 95% confidence intervals do not always imply statistical significance. Indeed, a number of commentators have argued strongly that the 'arbitrary division of results' into 'significant' and 'non-significant' in this manner is unhelpful, and instead significance 'should be interpreted in the context of the type of study and other available evidence'[12].

Results

1. Population size

The total population size of both Glasgow and Scotland increased between 2001 and 2011, following periods of decline (long-term decline in Glasgow, relatively short-term decline in Scotland)[13,14,v].

Figure 1 shows the percentage change[vi] in the total population size for each individual GoWell study area and non-GoWell TRA, alongside comparative figures for all Glasgow and Scotland.

This emphasises that the vast majority of areas undergoing housing improvement, especially TRAs (GoWell and non-GoWell), have experienced considerable levels of population change, in most cases greatly in excess of what has occurred at the level of the city (and country) as a whole. As is discussed elsewhere in this paper, this adds to the problems of interpreting changes in health-related indicators in many areas (and area types).

Figure 1.
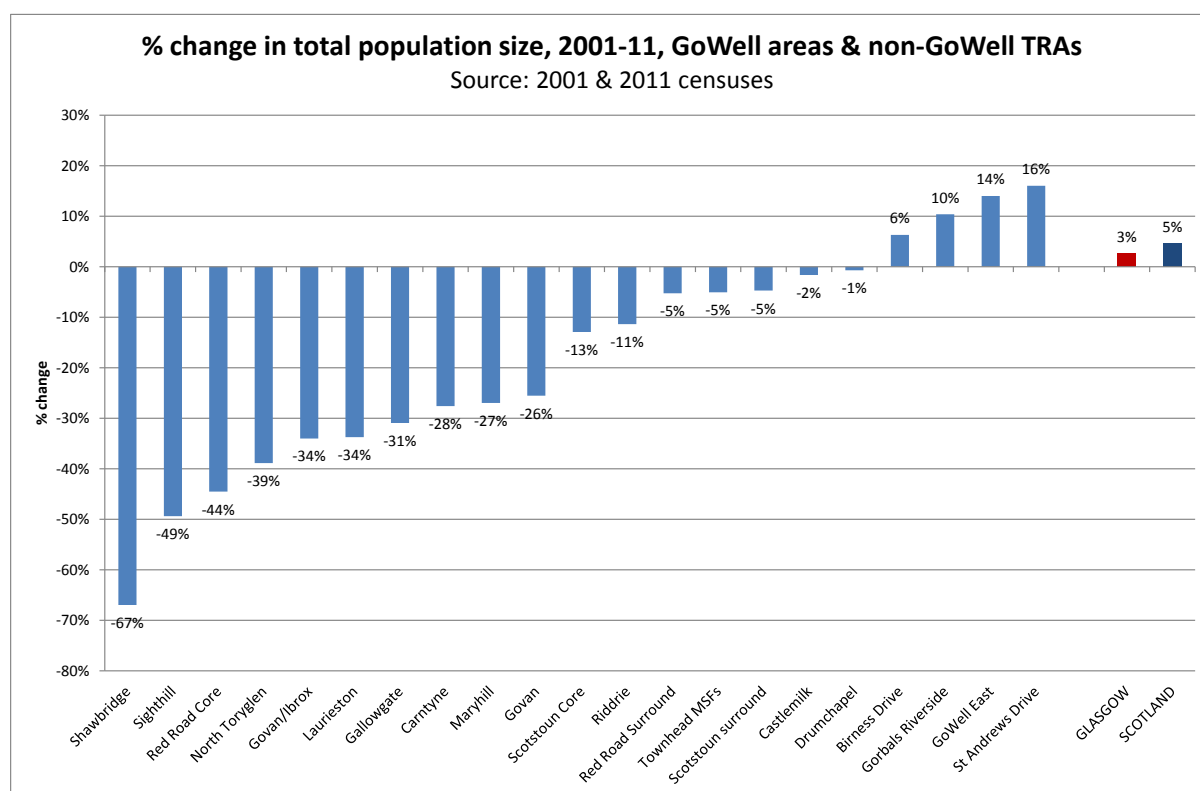
% change in total population size, 2001-11, GoWell areas & non-GoWell TRAs
Source: 2001 & 2011 censuses

Figure 2 confirms that there has been an overall loss of population across all the GoWell study areas combined, but an even greater loss among the TRAs elsewhere in the city. In contrast, the GoWell East area has seen a notable *increase* in its total population size. Figure 3 shows that among the GoWell area types, the greatest decline has been among the TRAs, followed by the HIAs. Population sizes have been more stable in PEs and LRAs (although, as Figure 1 shows, the figure for LRAs masks considerable variation across the three individual areas of that type e.g. population increases of 10% and 16% in Gorbals Riverside and St Andrews Drive respectively, and a 13% decrease in the Scotstoun core area).
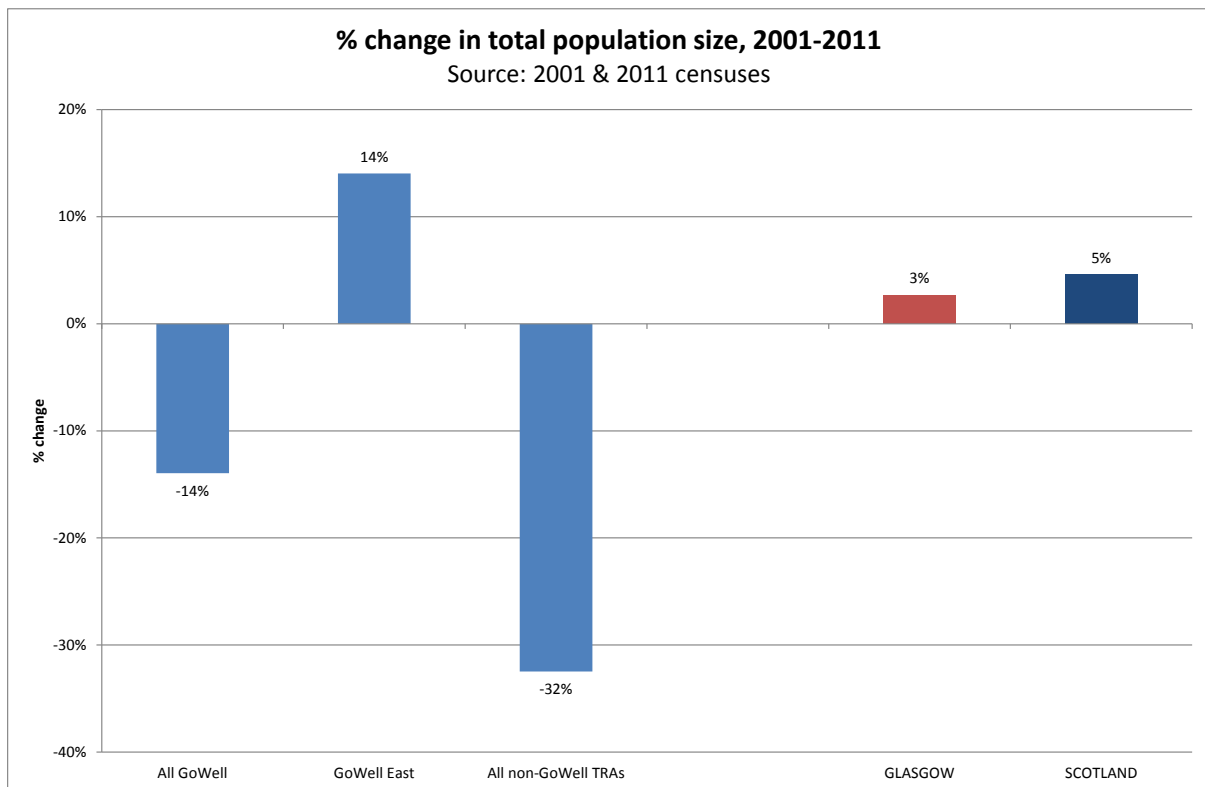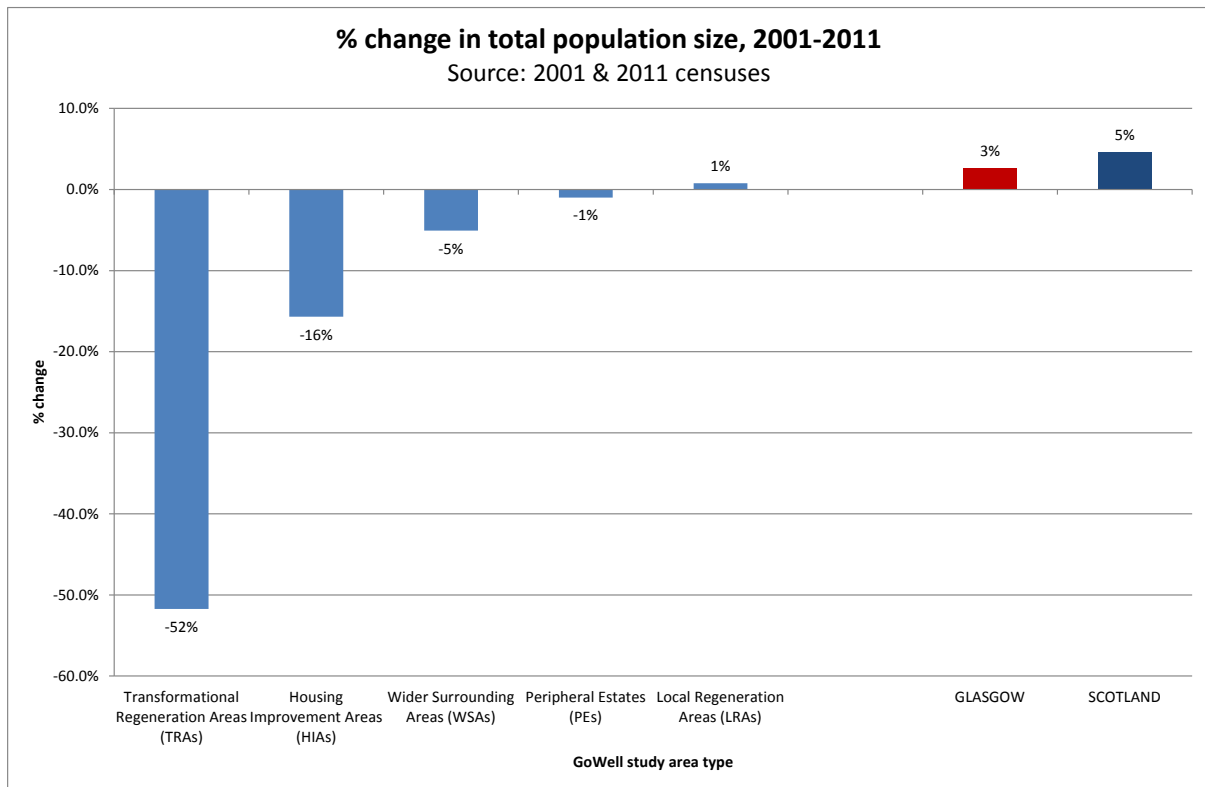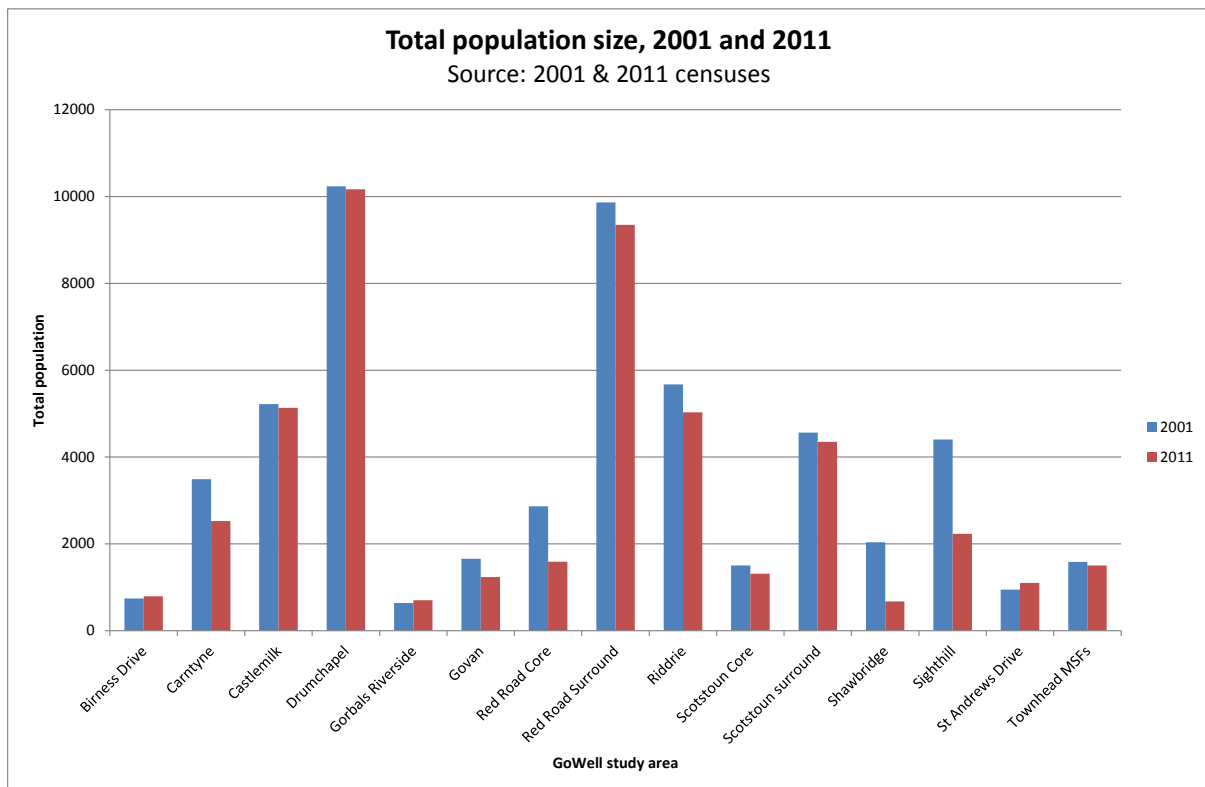
Figure 2.

% change in total population size, 2001-2011
Source: 2001 & 2011 censuses

12

Figure 3.

% change in total population size, 2001-2011
Source: 2001 & 2011 censuses

It is worth bearing in mind the considerable variation in overall population size across the different areas. As one example, Figure 4 shows the total size of the resident population in 2001 and 2011 for each of the GoWell study areas, with numbers ranging from a few hundred (Gorbals Riverside) to more than 10,000 (Drumchapel).

Figure 4.

Although not shown here, the population size of the non-GoWell TRAs also varies enormously: from just over 800 (North Toryglen) to over 4,000 in Govan/Ibrox (the latter figure having decreased from around 6,500 since 2001)[vii].

The largest area considered in this report is GoWell East. The 14% increase in population size shown in Figure 2 represents an increase from 19,420 to 22,146 between 2001 and 2011.

[vii] Total population sizes of the non-GoWell TRAs in 2011 were: North Toryglen: 815; Gallowgate: 842; Laurieston: 1,386; Maryhill: 2,517; Govan/Ibrox: 4,303.

Finally, Figure 5 shows the total population size in the two periods by area type. The smallest is the LRAs (around 3,100 in 2011) and the largest the PEs (around 15,000).

Figure 5.

Total population size, 2001 and 2011
Source: 2001 & 2011 censuses
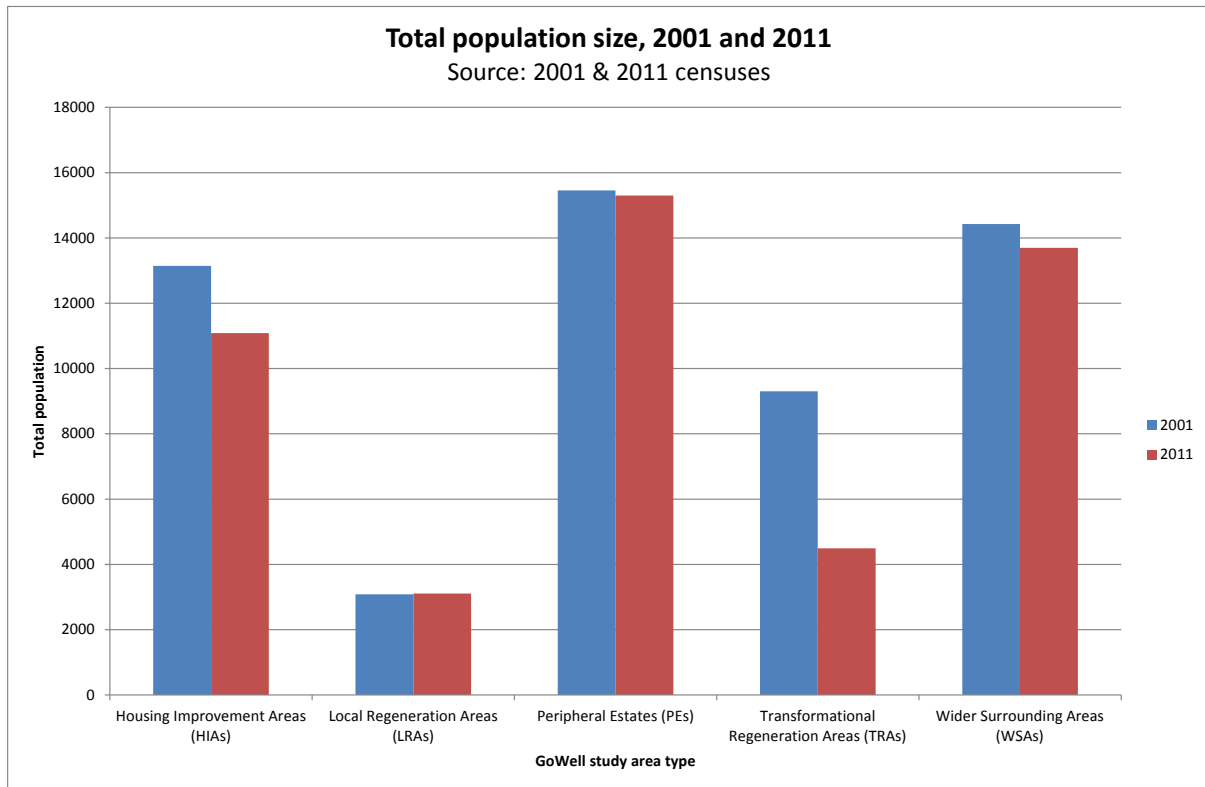
2. Maternity-related indicators

Teenage pregnancies

Between 2000/02 and 2010/12, rates of teenage pregnancies fell considerably in both Scotland as a whole (from 5.5% to 4.4% of females aged 15-19 years, a reduction of 20%) and, to a larger extent, in Glasgow (from 6.4% to 4.6%, a reduction of 29%). The decrease across all the GoWell areas was very similar to that observed in Glasgow (-28%), but it was even greater in the GoWell East area (-46%) and in the non-GoWell TRAs (-51%). Rates for the two time periods are shown in Figure 6.

Figure 6

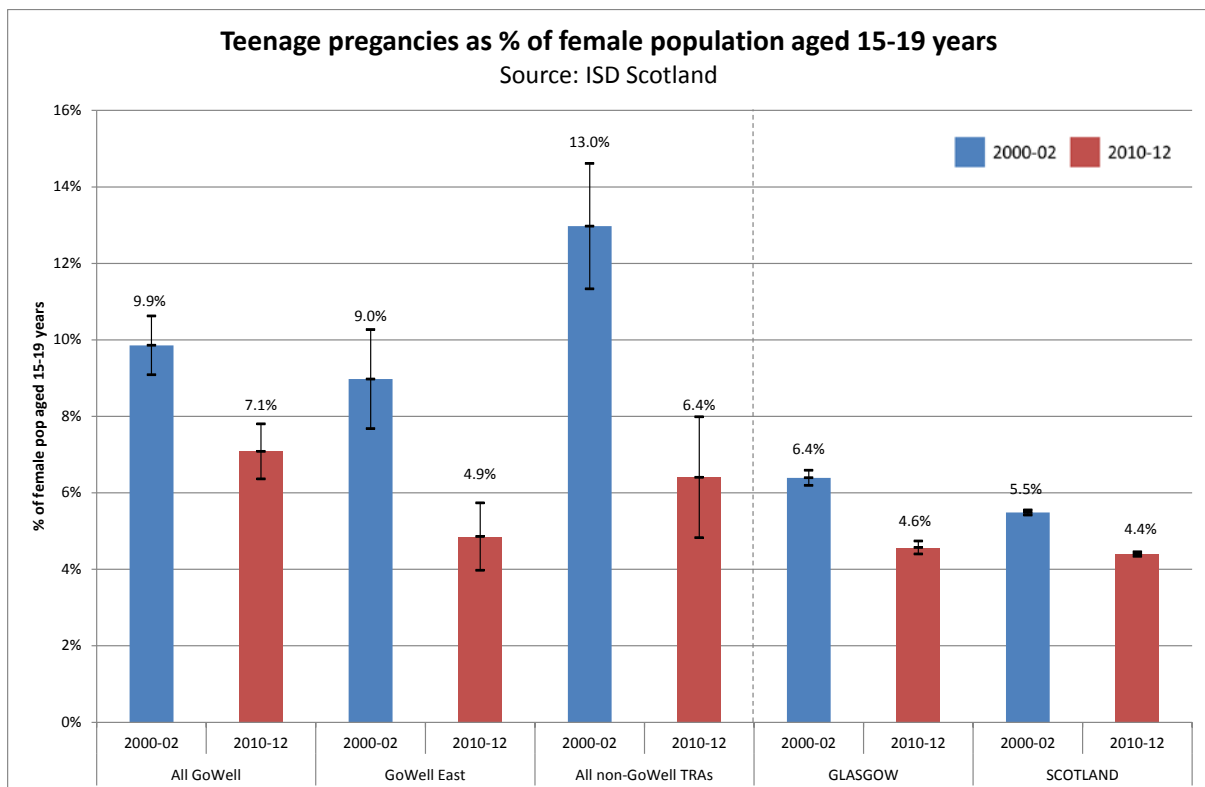Teenage pregancies as % of female population aged 15-19 years
Source: ISD Scotland

Figure 7 shows that this decrease was generally observed across all GoWell area types, with the exception of HIAs, where there was a small increase. In percentage terms, these decreases generally matched (LRAs: -29%) or bettered (PEs: -34%, TRAs: -35%, WSAs: -37%) the percentage decrease observed in Glasgow.
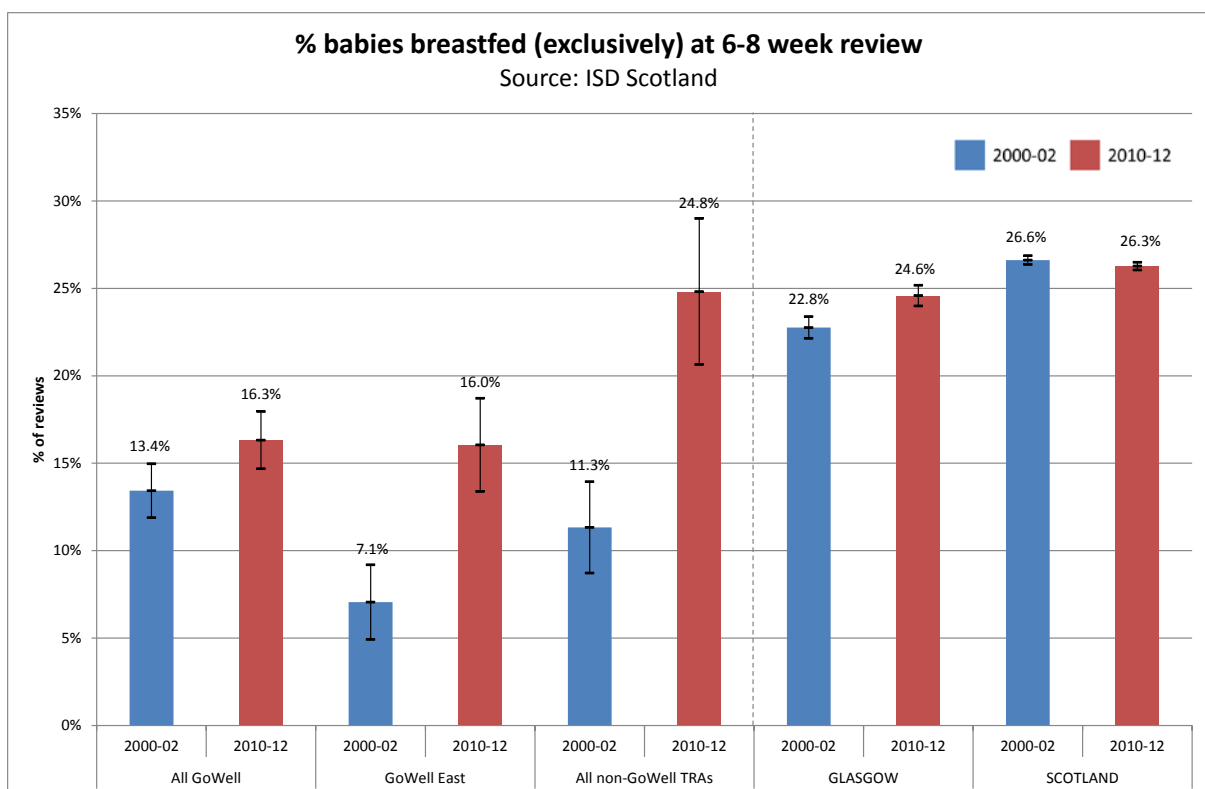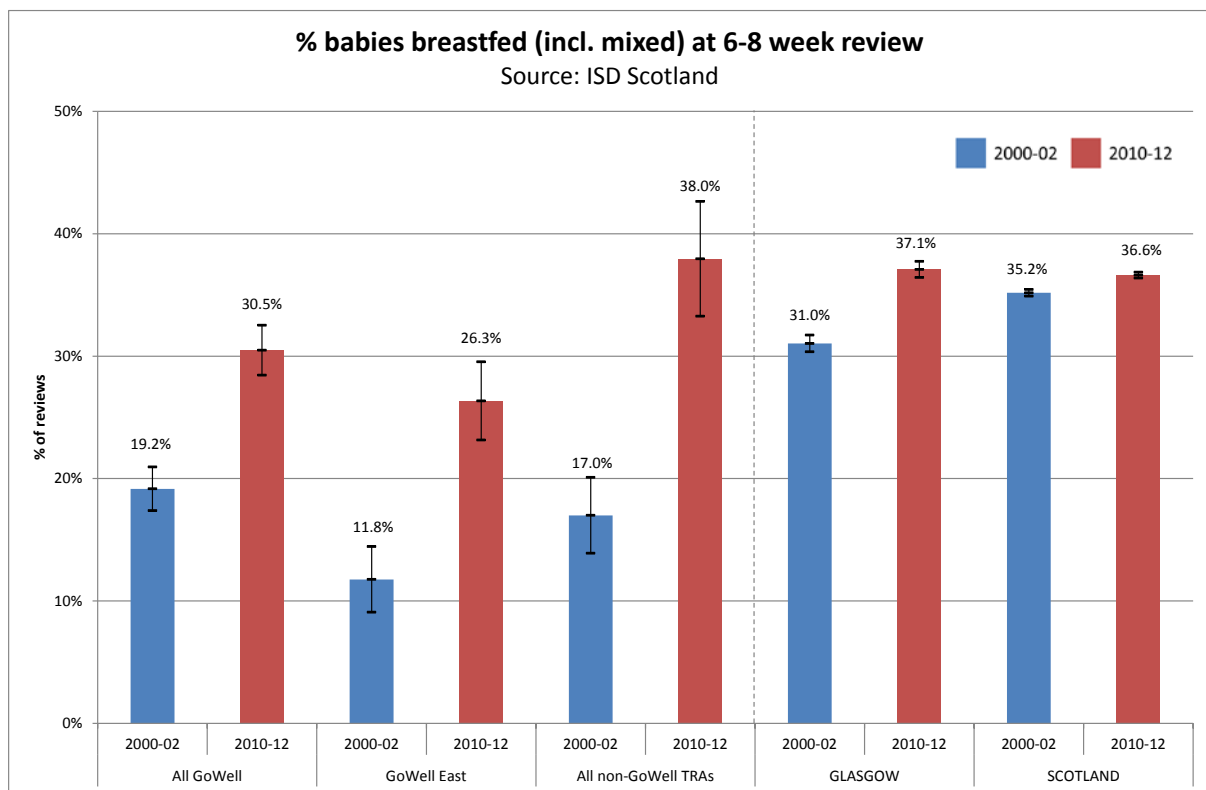
Figure 7
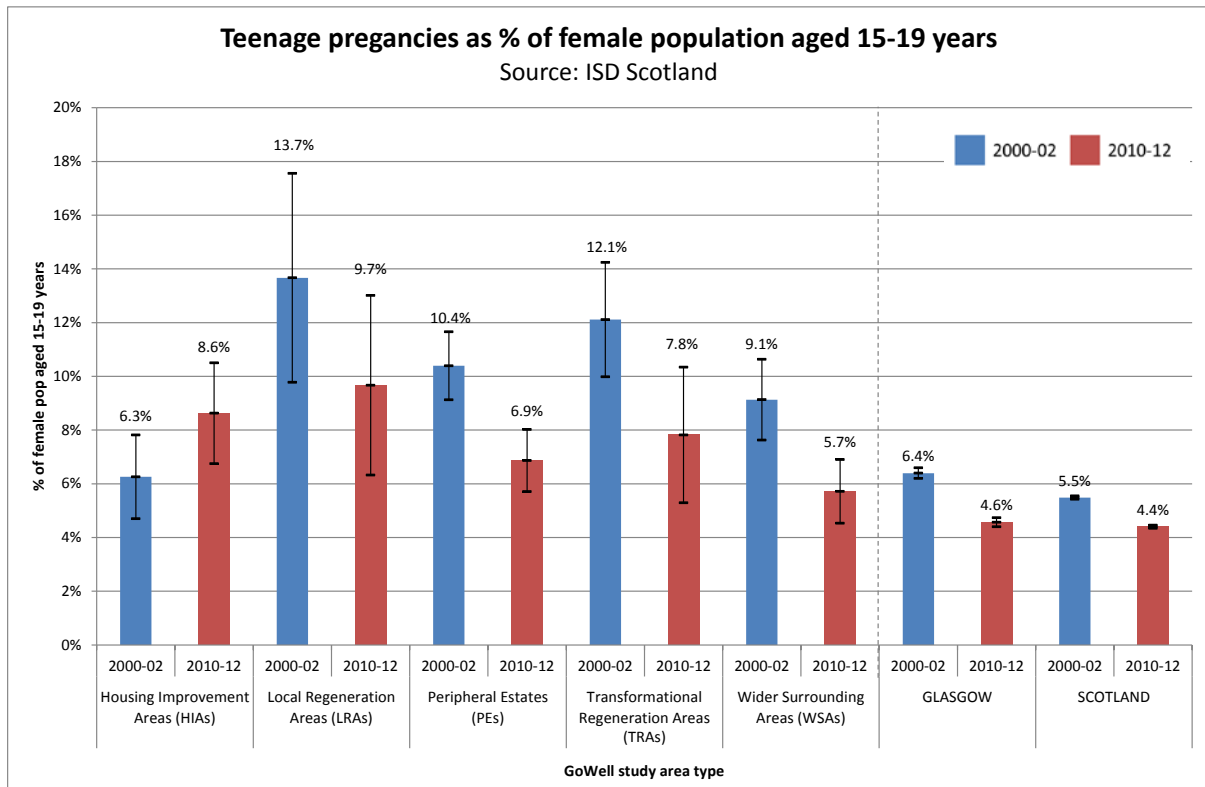
Breastfeeding

At the national level, there has been little change in rates of breastfeeding over a number of years. However, within Glasgow notable increases across housing intervention areas were recorded between 2000/02 and 2010/12: this is true both of babies being exclusively breastfed (Figure 8), and those receiving a mix of breast and formula feed (Figure 9). In GoWell East and the non-GoWell TRAs, breastfeeding rates more than doubled, and this level of increase resulted in breastfeeding rates in the non-GoWell TRAs being – by 2010/12 – on a par with Glasgow as a whole (this is true of both exclusive and mixed breastfeeding).
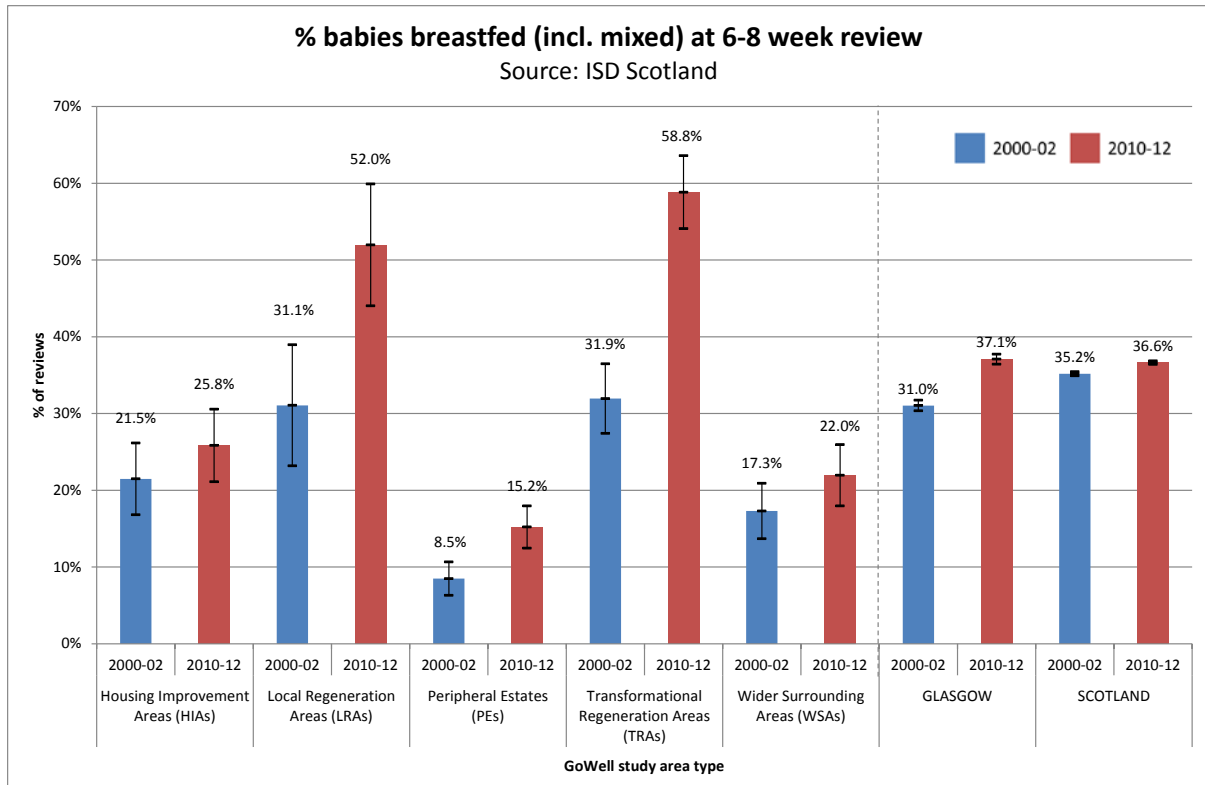
Figure 8

Figure 9

% babies breastfed (incl. mixed) at 6-8 week review
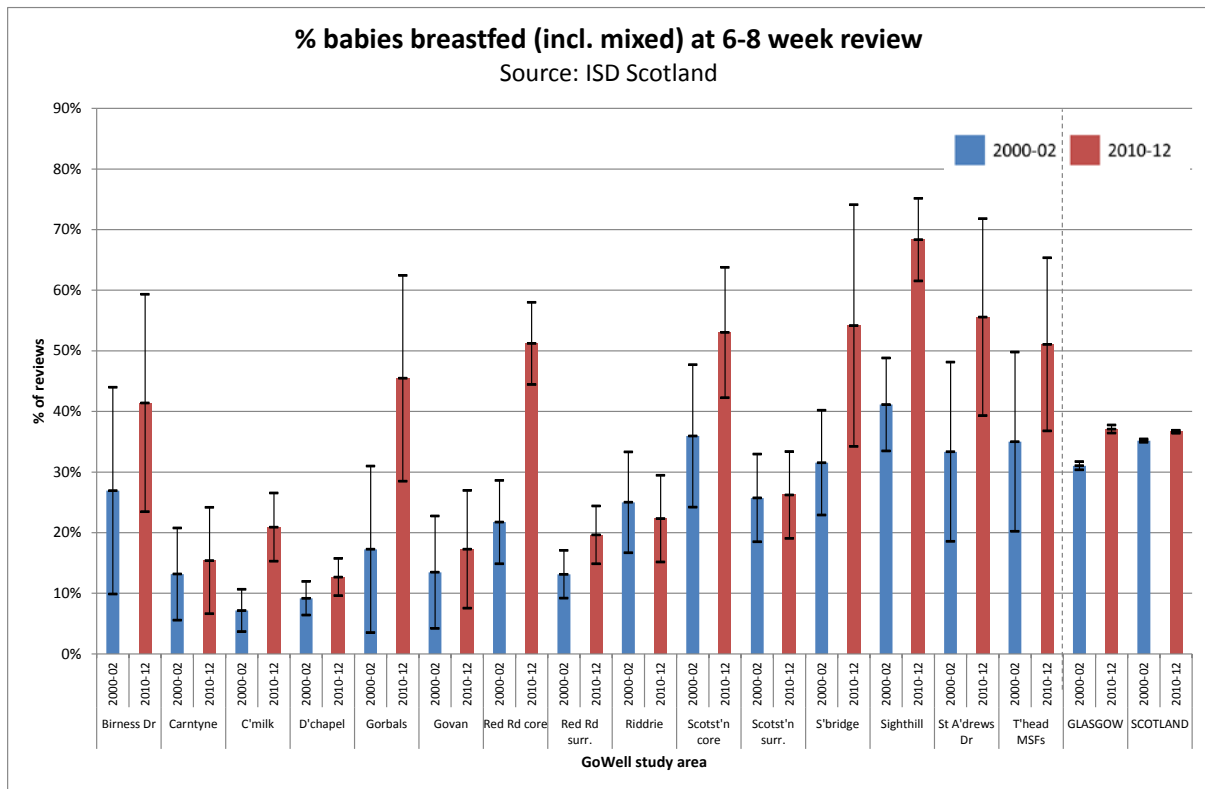Source: ISD Scotland

Interpretation of trends at the level of area type (Figure 10) and, especially, study area (Figure 11) and non-GoWell TRA (Figure 12), are problematic because of small numbers and levels of population change. Nonetheless, in overview, increases are evident across all areas.
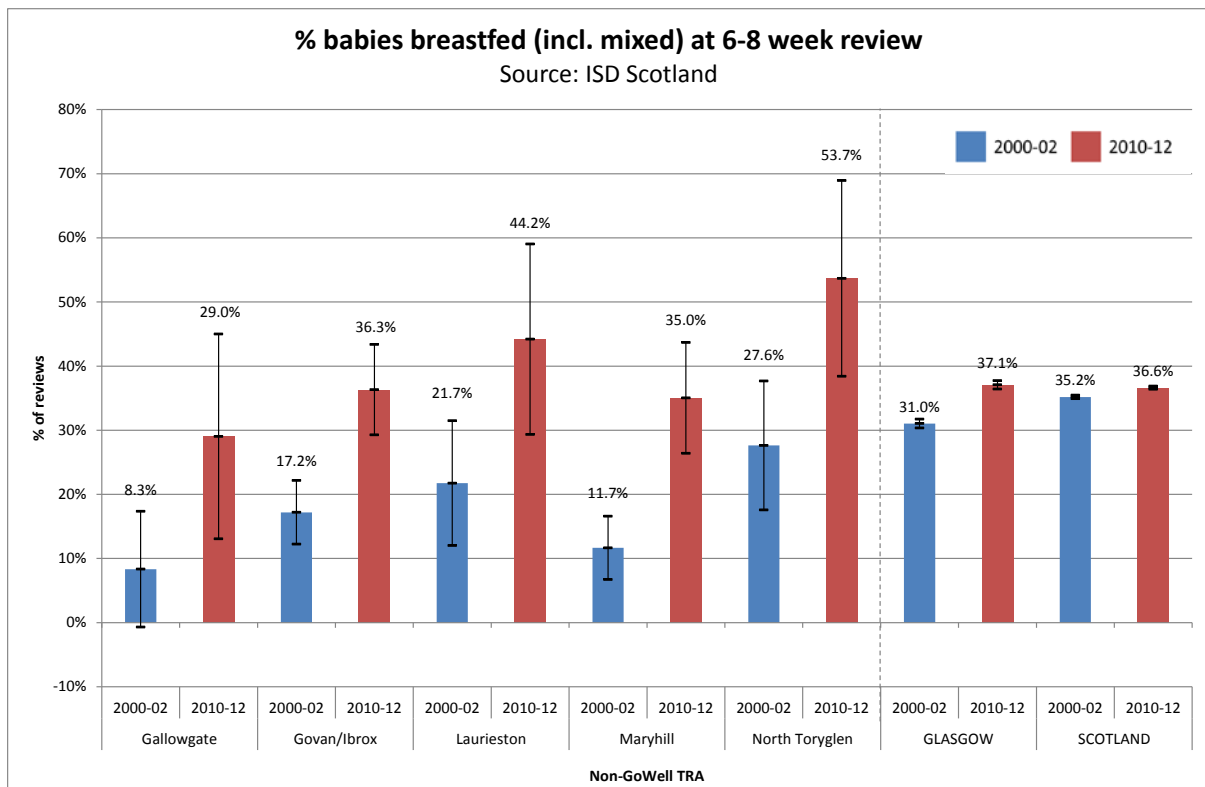
Figure 10

Figure 11

% babies breastfed (incl. mixed) at 6-8 week review
Source: ISD Scotland

Figure 12

% babies breastfed (incl. mixed) at 6-8 week review
Source: ISD Scotland

Maternal smoking

There has been a marked decline in rates of maternal smoking (as recorded by health visitors at their initial visit around ten days after the birth of the baby[viii]) across Scotland in recent times. This is confirmed by the analyses presented here comparing rates between 2000/02 and 2010/12: these show a decrease of approximately 30% over that period (from 25% of mothers in 2000/02 to 17% in 2010/12). However, the decline was even greater in Glasgow, falling from 31% to 16%, a reduction of almost 50%. As Figure 13 shows, similar reductions to Glasgow's were observed across the GoWell areas, GoWell East and the non-GoWell TRAs.

Although the level of reduction varies across the different GoWell area types, all types showed a marked decrease (Figure 14): only in HIAs was the reduction not statistically 'significant' (in the sense of the 95% confidence intervals not overlapping). As with other analyses, interpretation of change over time at the level of individual study area is difficult due to population size: however, Figures 15 and 16 show a consistent reduction in maternal smoking rates across the vast majority of areas (GoWell and non-GoWell study areas).

Figure 13
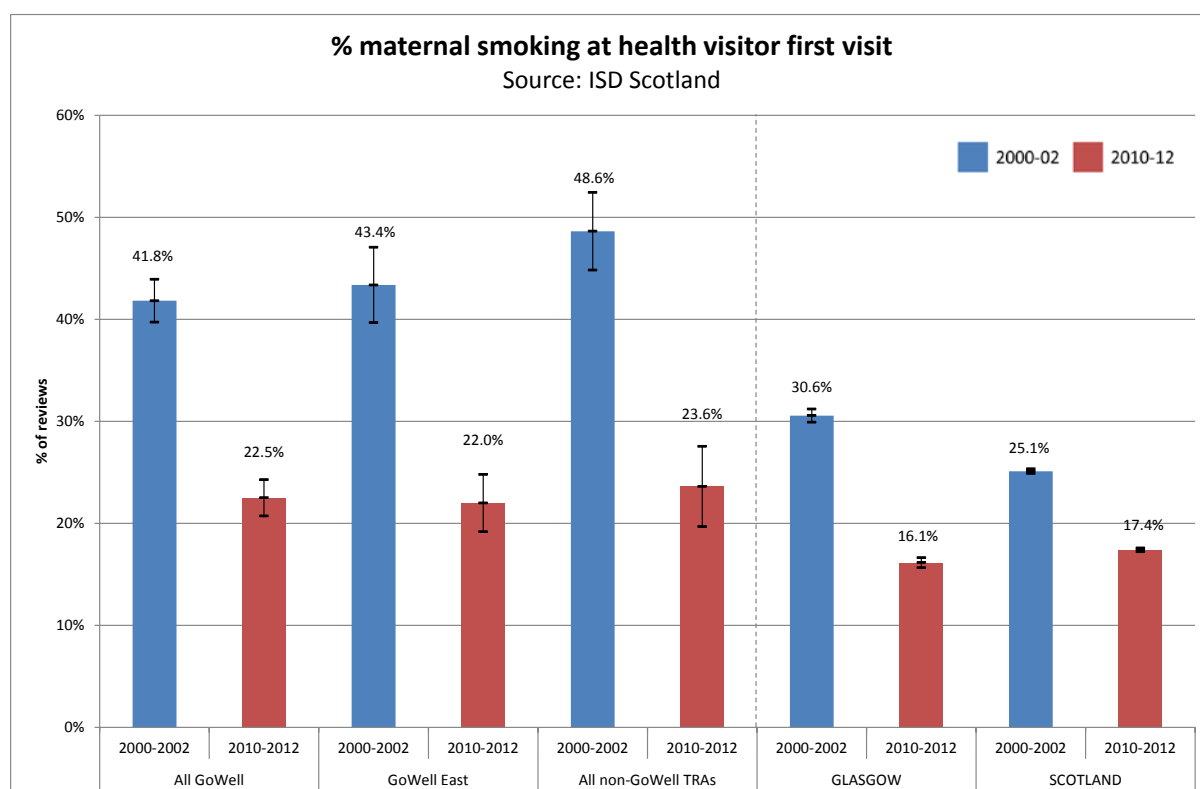
[viii] There are two routinely recorded (and published) data sources for maternal smoking: one is recorded at the first antenatal hospital visit; the second at the first health visitor review approximately ten days after the birth. Although the former should theoretically provide a more accurate figure of maternal smoking, a number of analyses by ISD Scotland and others have shown previously that within Glasgow in particular these data can be highly problematic. Thus, the health visitor data are deemed to be preferable.
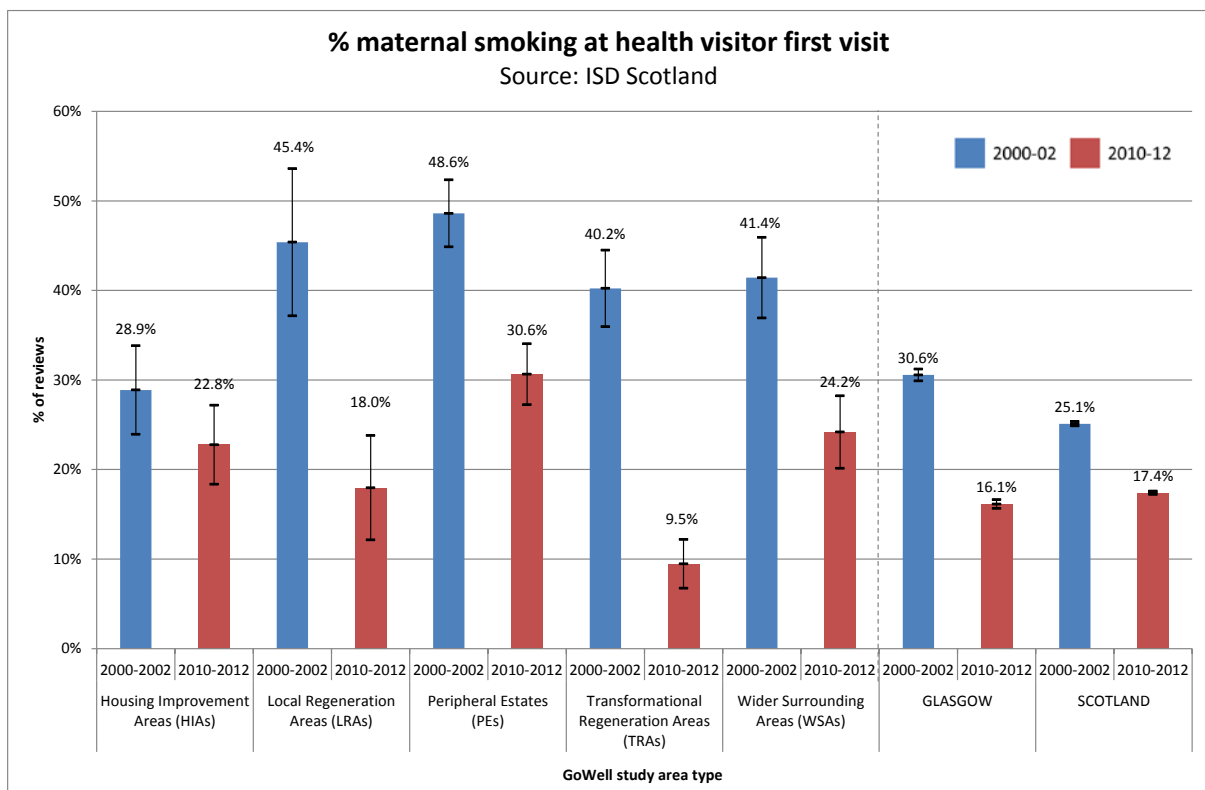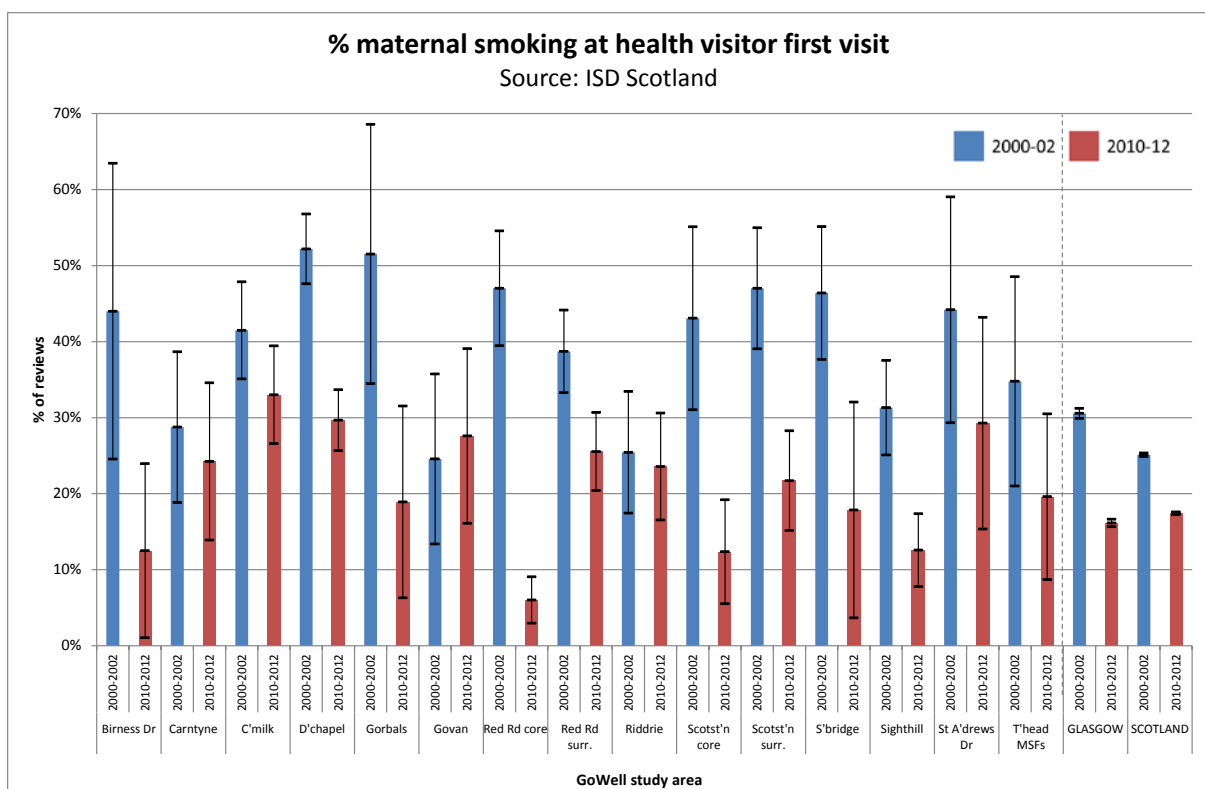
Figure 14

% maternal smoking at health visitor first visit
Source: ISD Scotland

Figure 15

% maternal smoking at health visitor first visit
Source: ISD Scotland

Figure 16

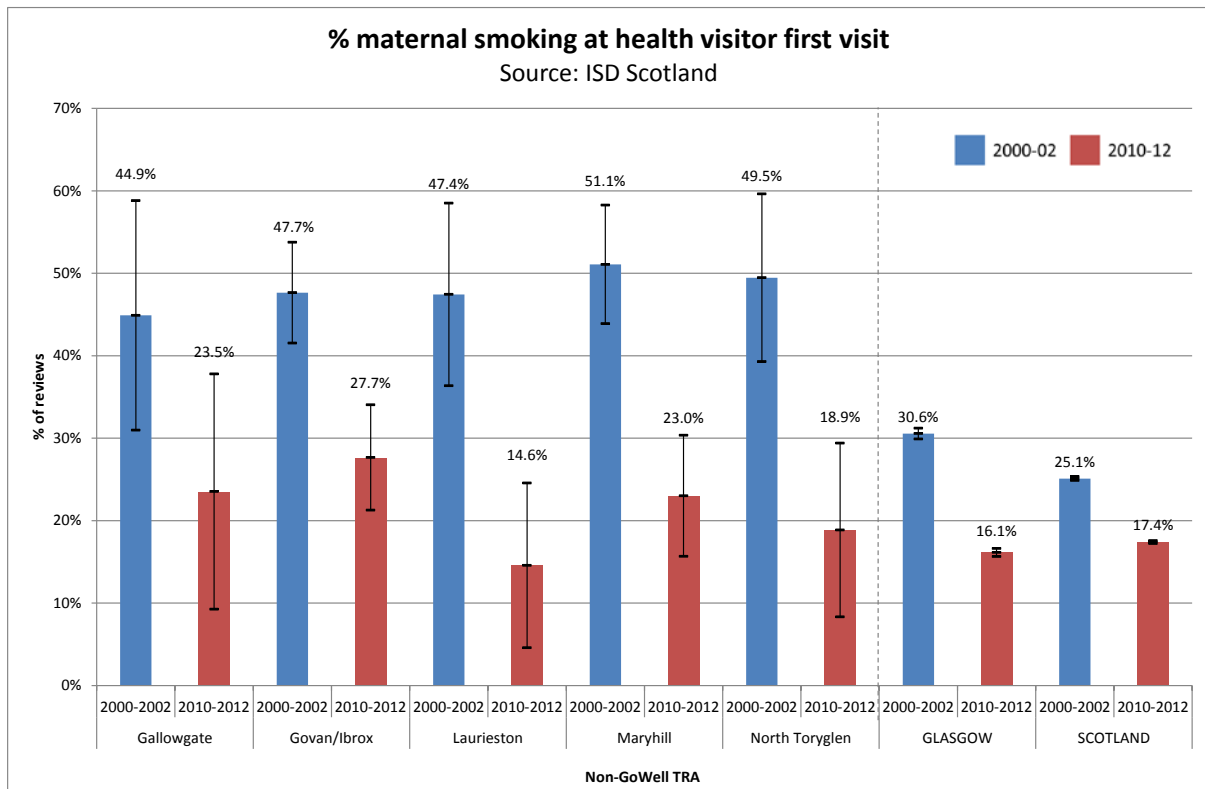% maternal smoking at health visitor first visit
Source: ISD Scotland

3. Life expectancy & mortality
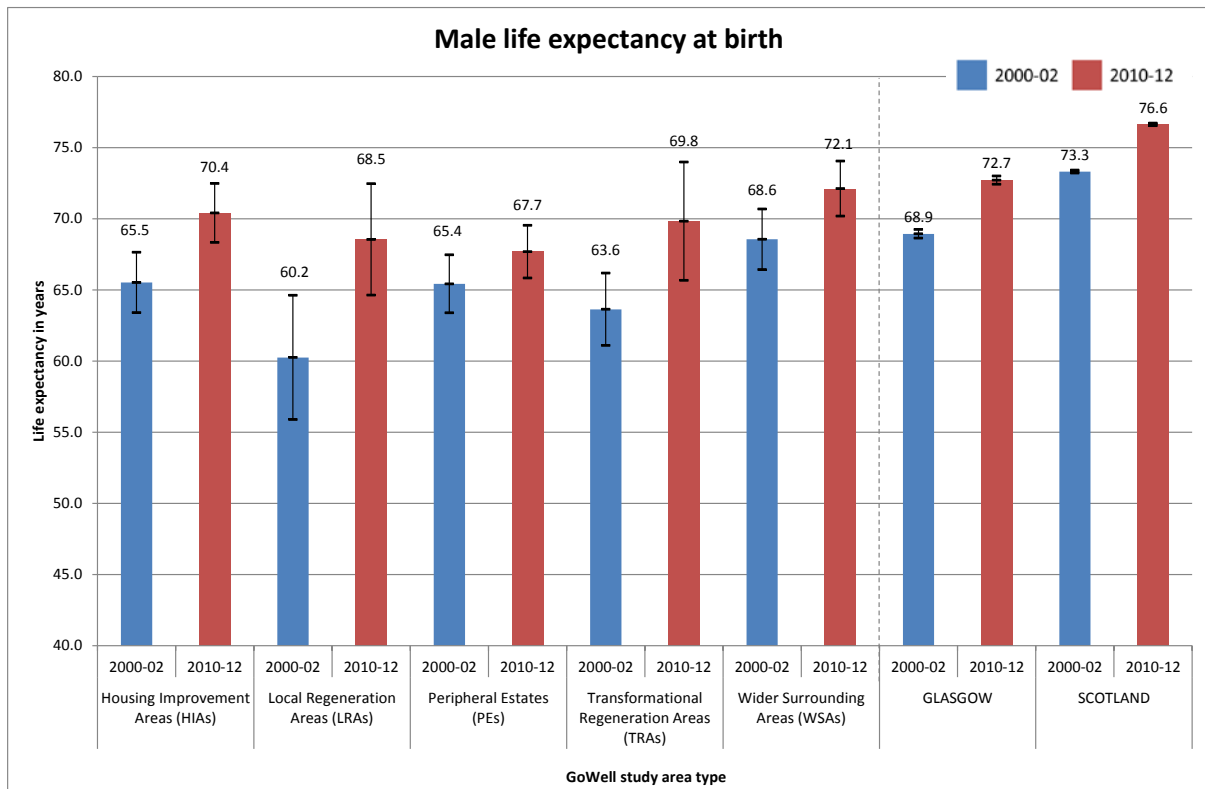
Life expectancy

Between 2000/02 and 2010/12, male life expectancy in Glasgow increased by 3.8 years (an approximate 5.5% improvement). This was a slightly greater improvement than that observed for Scotland (3.3 years, 4.5%). Broadly similar increases were seen across the GoWell areas and non-GoWell TRAs, although a greater increase was observed in the GoWell East area (6.3 years, 10%). These are shown in Figure 17. Improvements were also seen across the five different GoWell area types, although the smaller population sizes and numbers of deaths, and resulting overlapping 95% confidence intervals, make meaningful interpretation of change over time at this level more problematic (Figure 18)[ix].

Figure 17
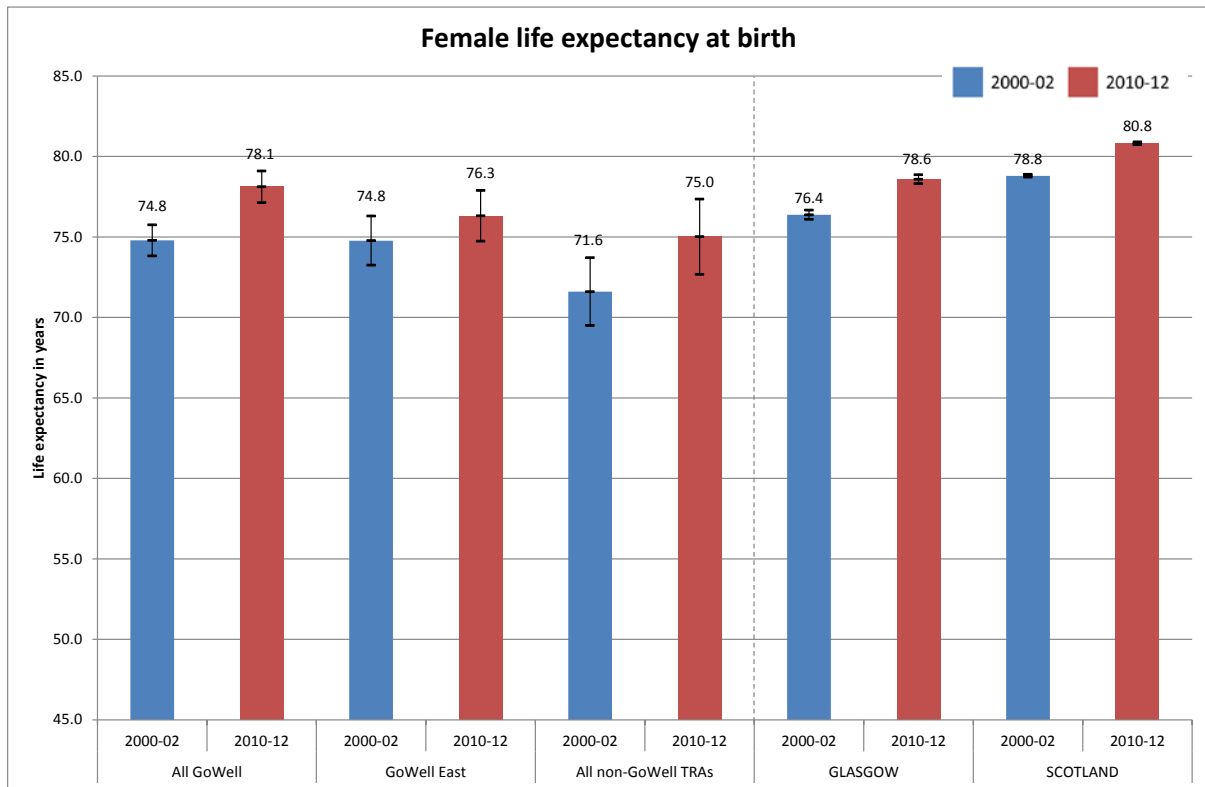

Male life expectancy at birth
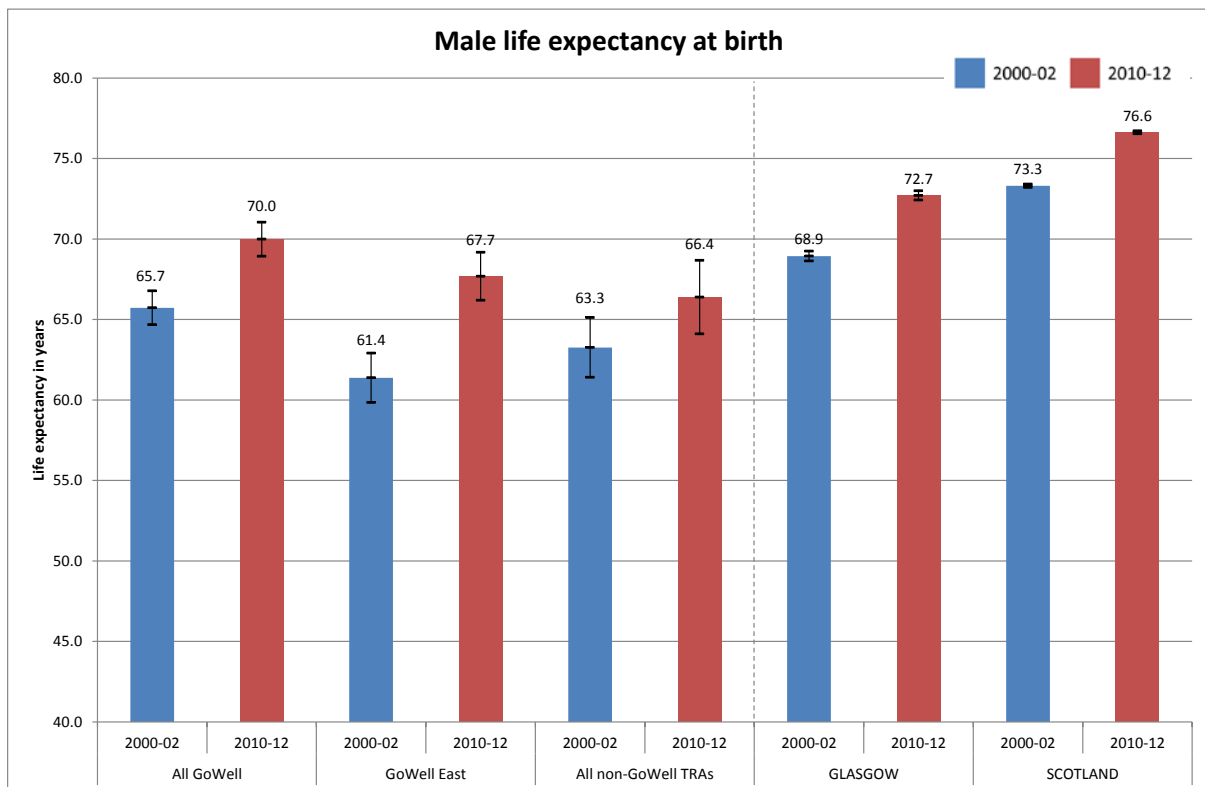
[ix] Note, however, that 'significant' change (i.e. in the sense of the 95% confidence intervals *not* overlapping) was observed for HIAs: male life expectancy increased 4.9 years (or 7.5%).

Figure 18
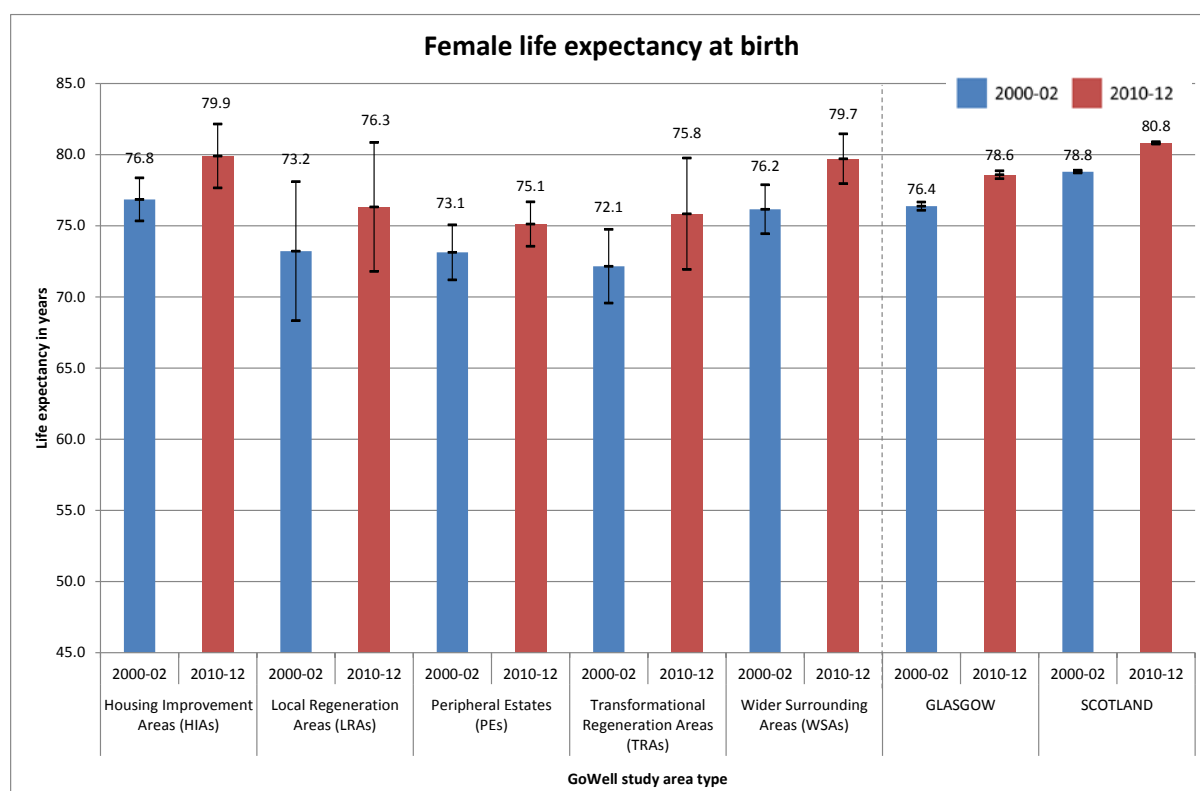

Male life expectancy at birth

Similar trends are observed for female life expectancy (Figures 19 and 20), although absolute increases were lower (e.g. approximately two-year increases in both Scotland and Glasgow), and the above-average increase in life expectancy observed for males in the GoWell East area was not seen for females. Again, at the level of area type, overlapping 95% confidence intervals mean we are limited in what we can say about 'significant' change (in a statistical sense)[x].

Figure 19

Female life expectancy at birth

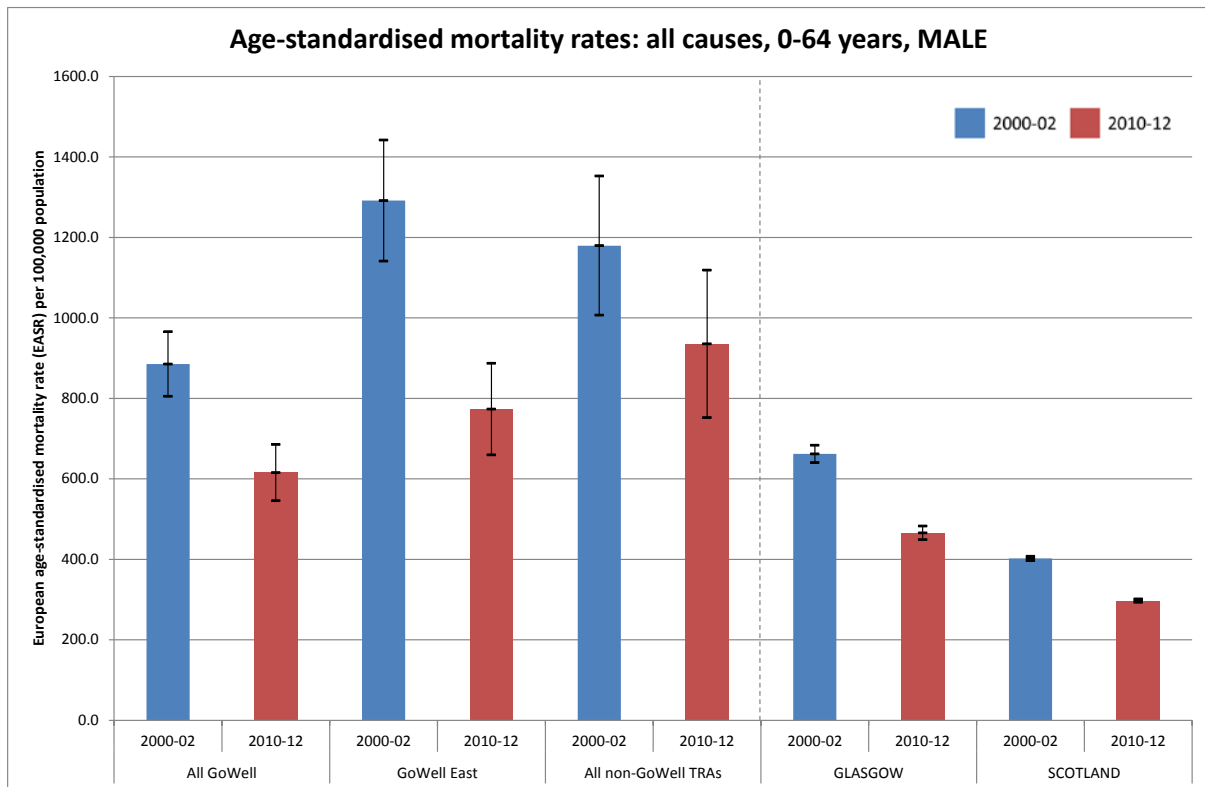**Figure 20**

Female life expectancy at birth

Mortality

Detailed trends in <u>all-cause mortality</u> for all ages are not presented here, given their similarity to the life expectancy results shown in the previous section. However, it is worth highlighting the notable decrease in rates of all-cause *premature* mortality (age<65 years) among men in the GoWell East area in particular. The reduction shown in Figure 21 represents a 40% decline over the period (compared with -30% for Glasgow and -26% for Scotland).[xi]

[xi] Among men, all-cause mortality rates for *all ages* decreased in Scotland in the period by 22%. The equivalent figure for Glasgow was similar: -19%. As with life expectancy, 'significant' change was observed in GoWell East (-22%) and HIAs (also -22%). Among females, all-age mortality rates decreased by 15% in Scotland and by 14% in Glasgow. HIAs also saw a 'significant' reduction in rates (-29%).

Figure 21

Age-standardised mortality rates: all causes, 0-64 years, MALE

All cancers: Figure 22 shows that for men, mortality from all cancers declined in both Glasgow (-10%) and Scotland (-13%). However, such decreases were less apparent across GoWell areas, GoWell East and the non-GoWell TRAs. No significant changes in male cancer mortality rates were observed across area types (Figure 23).
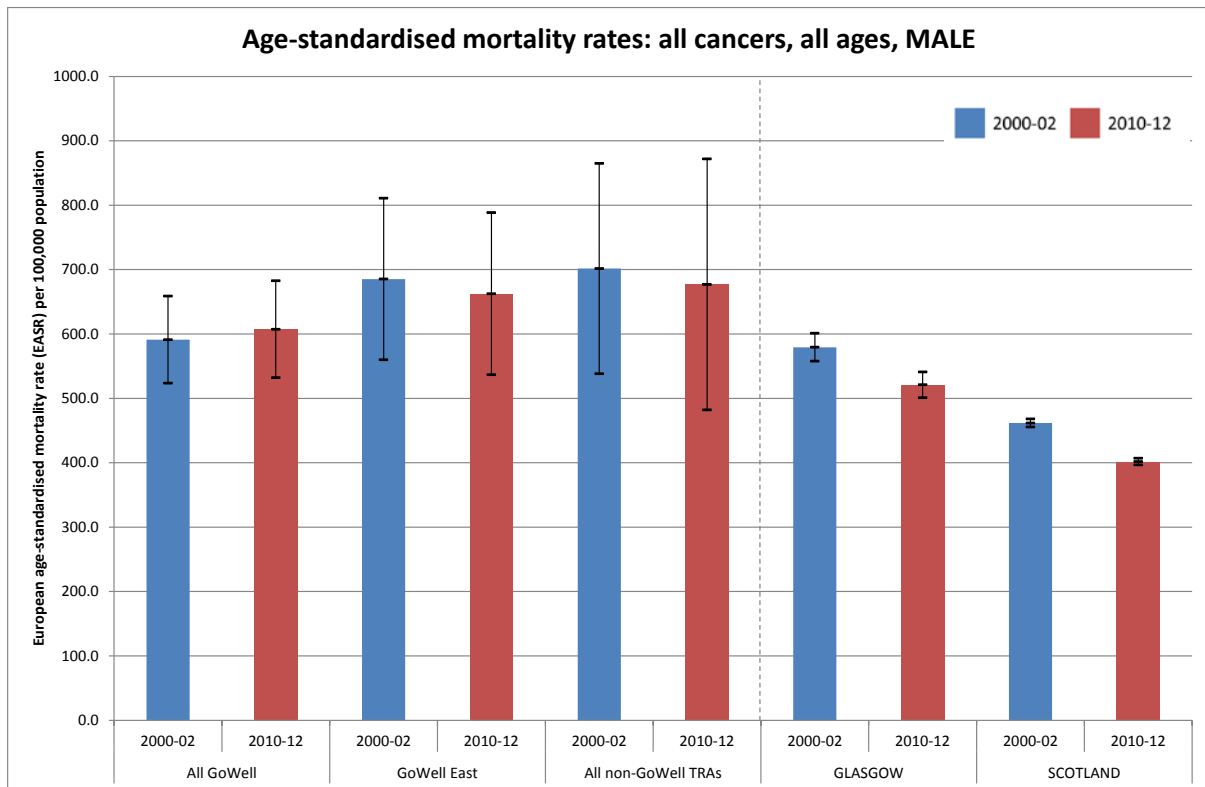
Figure 22

Figure 22: Age-standardised mortality rates: all cancers, all ages, MALE

Figure 23

Figure 23: Age-standardised mortality rates: all cancers, all ages, MALE
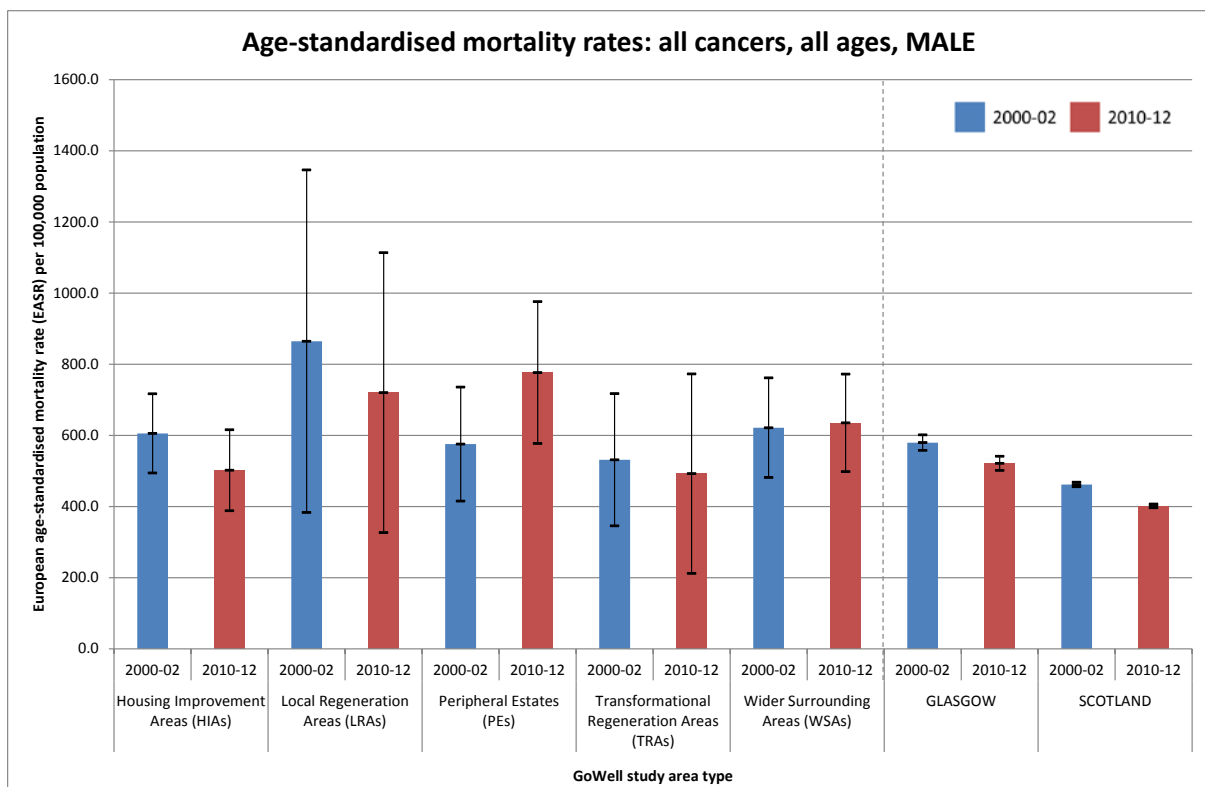
For females, Figure 24 shows that mortality rates decreased in Scotland (-6%) and also (although to a lesser, and non-significant, degree) in Glasgow (-4%). However, generally such decreases were not observed in housing intervention areas, although interpretation of change over time is again difficult because of overlapping 95% confidence intervals (even more problematic at the level of GoWell area type (Figure 25)).

Figure 24

Age-standardised mortality rates: all cancers, all ages, FEMALE

Figure 25

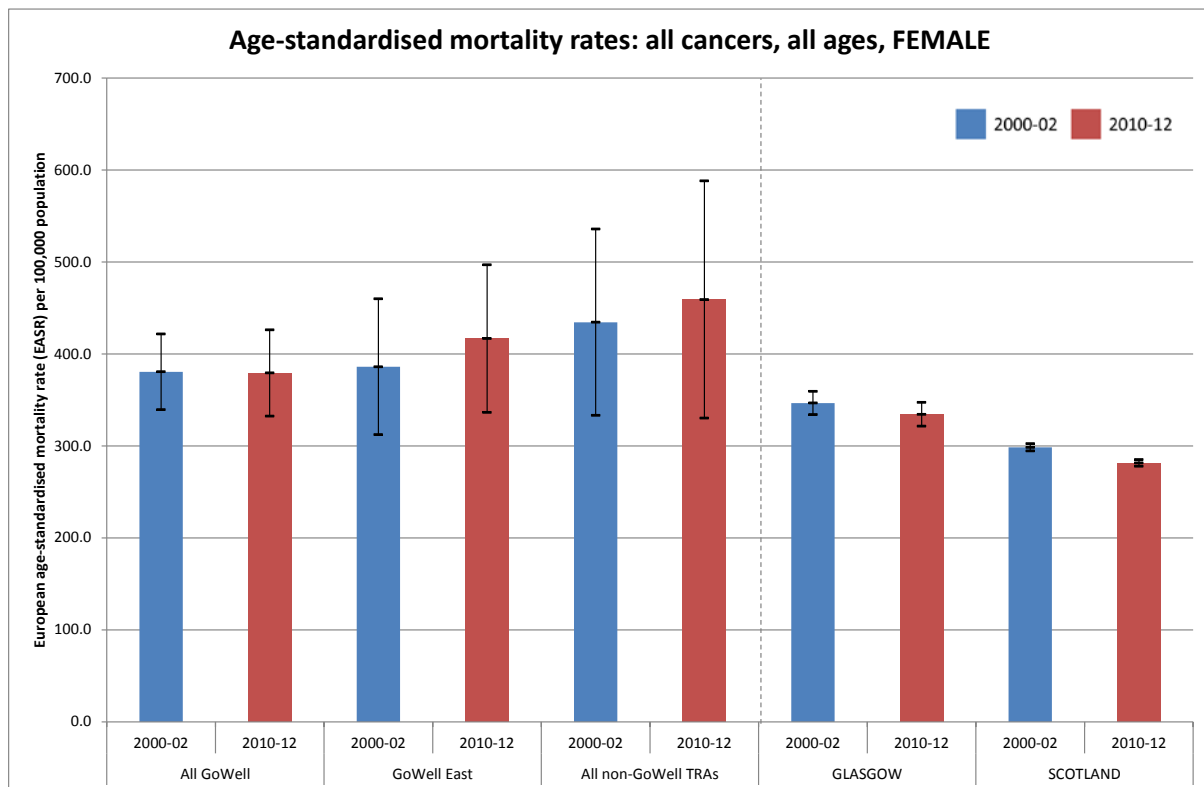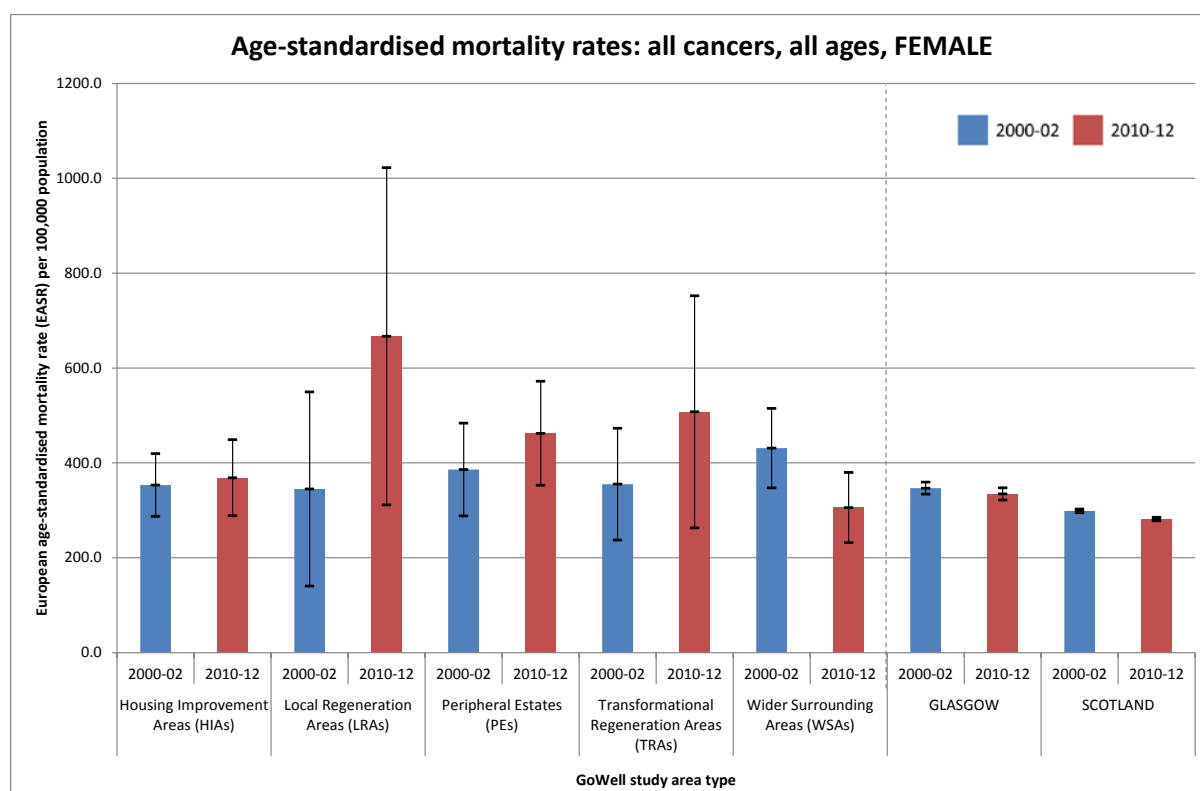**Age-standardised mortality rates: all cancers, all ages, FEMALE**

Note that Figure 25 suggests that there has been a notable increase in female cancer mortality rates in LRAs. It is worth highlighting, however, that, as reflected in the wide 95% confidence intervals, these calculations are based on very small numbers. The increase in this particular rate is based on only 11 deaths over the first three-year period (2000-02) and 14 deaths over the second three-year period (2010-12), accompanied by a small decrease in the size of the female population over time.

Lung cancer: at the national level, the contrasting trends in lung cancer mortality for men and women are well known. Rates among males have declined sharply since their peak in the mid-1970s to early 1980s; in contrast, rates for women peaked in the mid-1990s and have not decreased significantly since. This reflects cohort effects related to the different peak periods of male and female smoking prevalence[15]. This is shown (over the more limited time period included in these analyses) in Figures 26 and 27: rates among Scottish males declined (by -20%), but rates for females increased (by 8%). As can be seen, these same gender differences in trends have also been observed in Glasgow[xii] and the various intervention areas with, in most cases, reductions among male deaths, and slight increases among females. However, any reductions have been slight, and rates for both males and females tend to be notably higher in the housing and regeneration intervention areas compared with Glasgow and Scotland as a whole.

[xii] Mortality rates for Glasgow *decreased* by 17% for males, but *increased* by 17% for females.

Figure 26

Age-standardised mortality rates: lung cancer, all ages, MALE

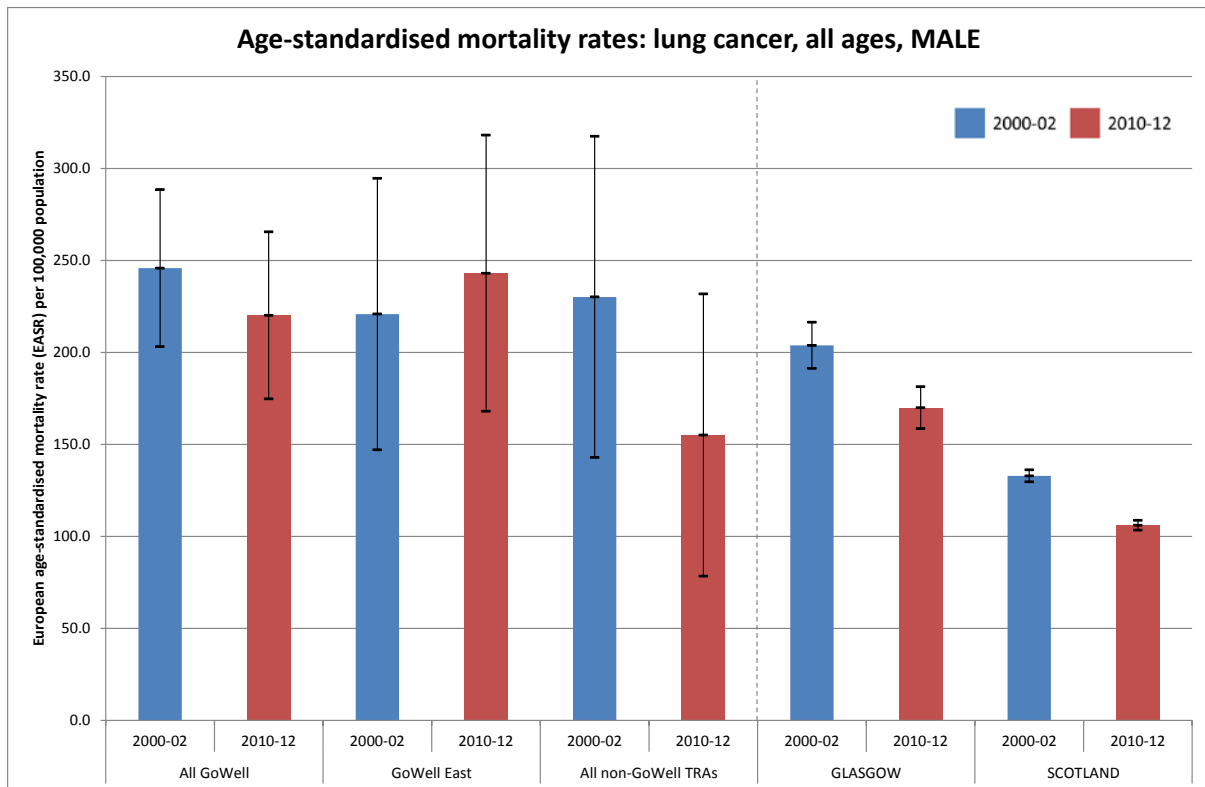
Figure 27
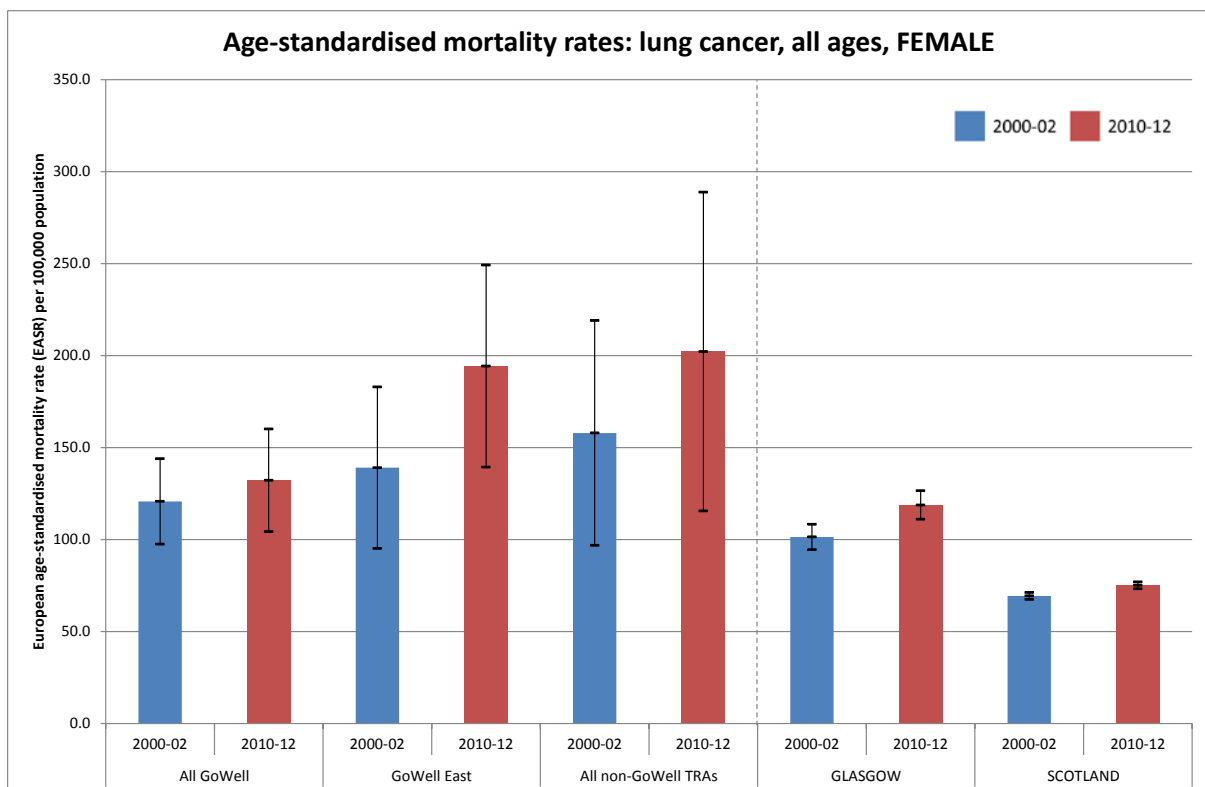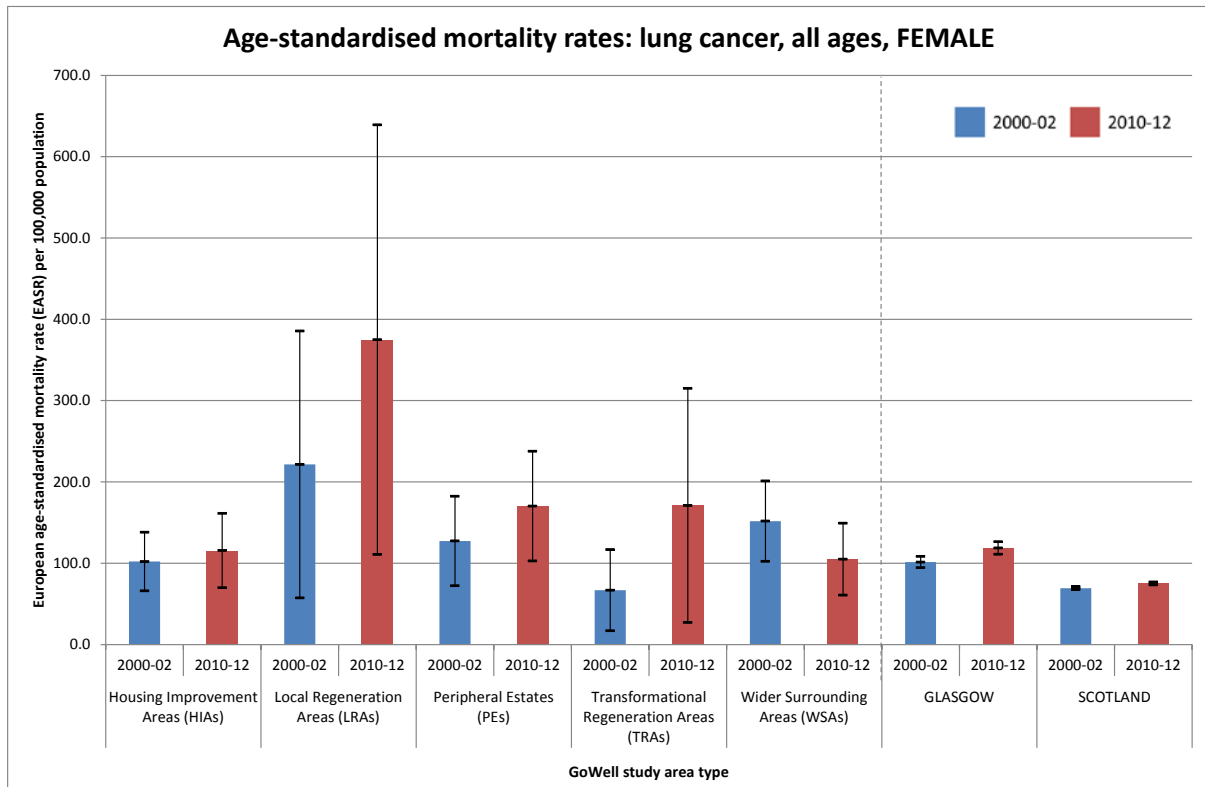

Age-standardised mortality rates: lung cancer, all ages, FEMALE

No significant changes were observed across area types (as with other analyses, this is a reflection of small numbers). As one example, female rates by area type are shown in Figure 28.

Figure 28

Age-standardised mortality rates: lung cancer, all ages, FEMALE

Diseases of the circulatory system: Figures 29 and 30 show that the notable decreases in mortality rates for this cause that have been observed in Glasgow and Scotland in recent times (approximately -40% for both males and females) have also been seen across Glasgow's housing and regeneration intervention areas. Figure 31 (showing % change in mortality rates for males and females combined) confirms that the rates of decrease seen in Glasgow and Scotland are broadly similar to those seen across the different GoWell area types.

Figure 29

Age-standardised mortality rates: circ. system diseases, all ages, MALE

Figure 30

Age-standardised mortality rates: circ. system diseases, all ages, FEMALE

Figure 31

% change in age & sex standardised mortality rates, 2000/02 - 2010/12 circ. system diseases, all ages
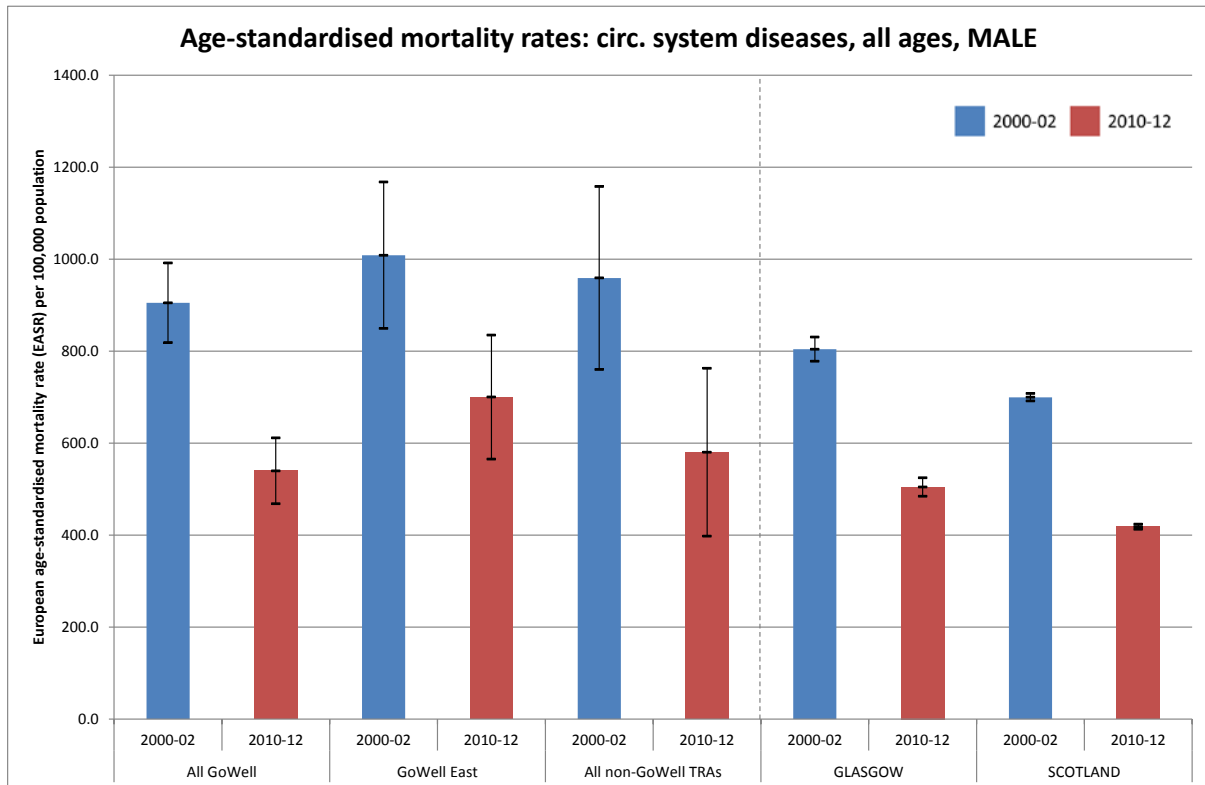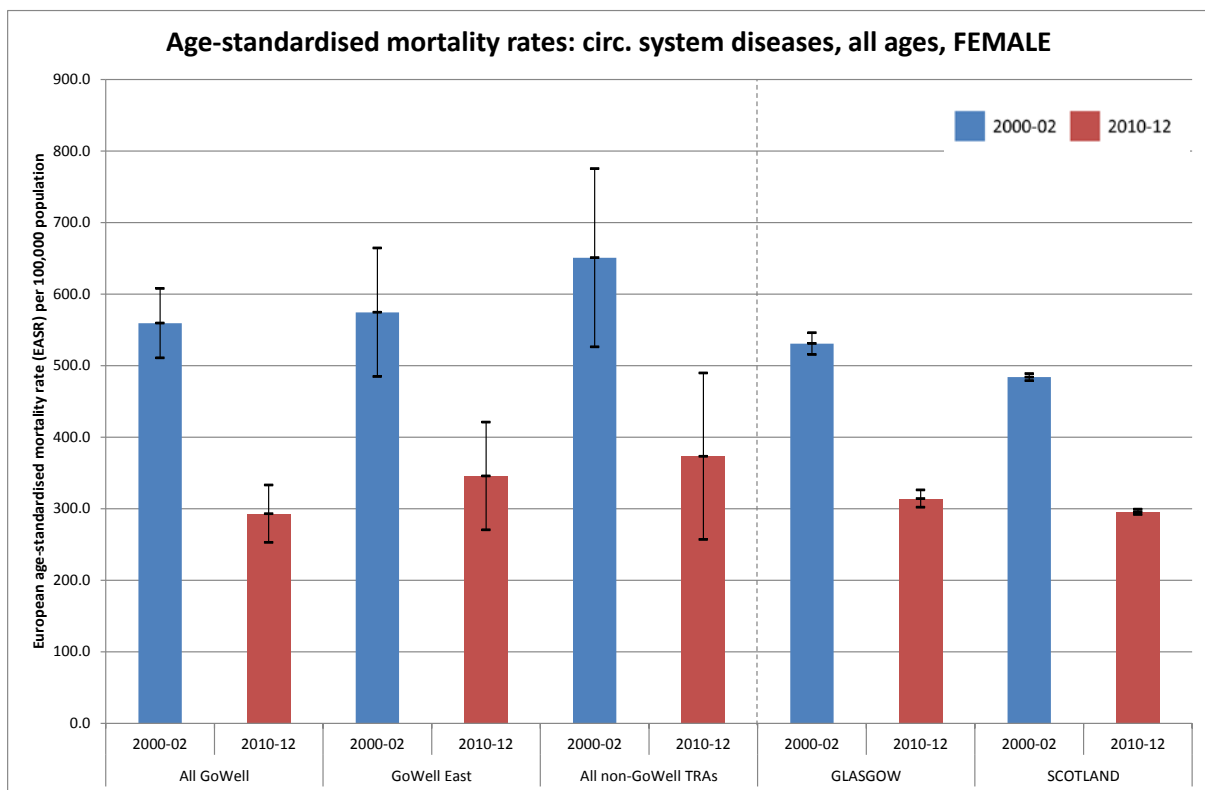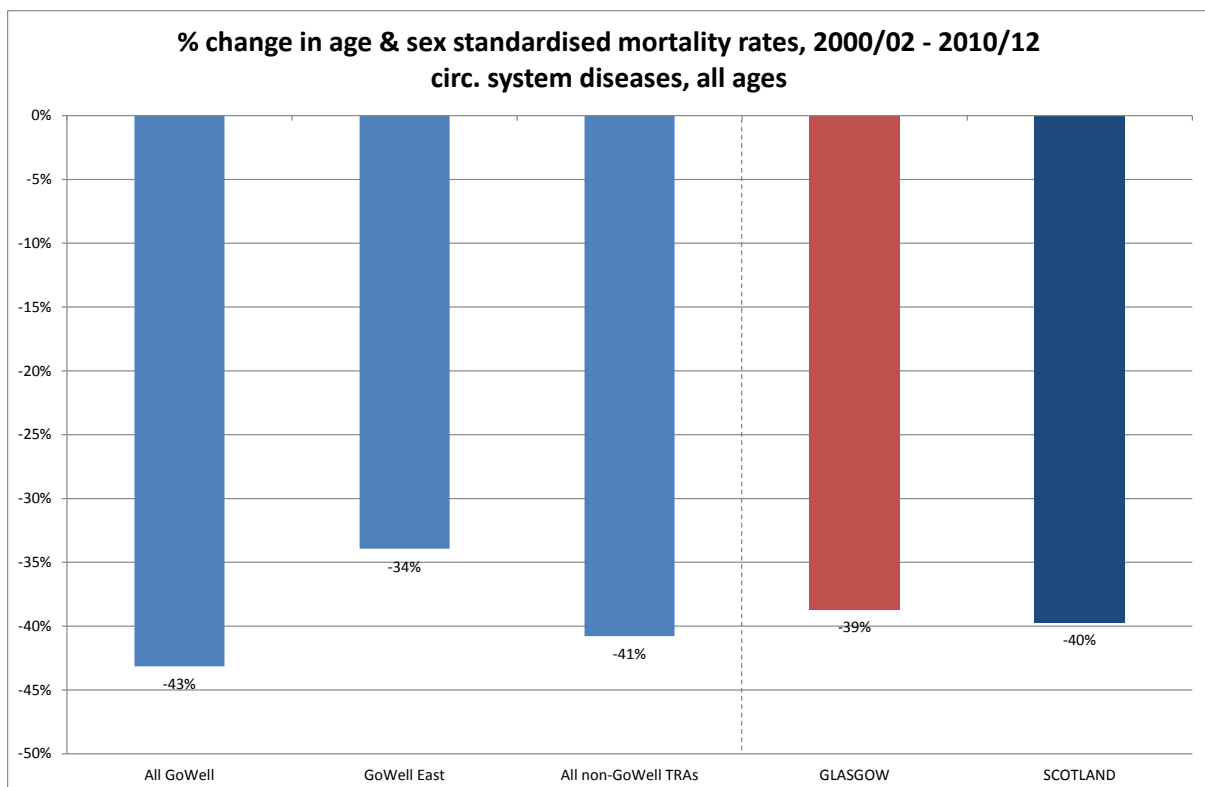
Note that changes in mortality rates for the two sub-sets of diseases of the circulatory system, ischaemic heart disease and cerebrovascular disease, are very similar to those shown for diseases of the circulatory system (i.e. very similar rates of improvement in the housing intervention areas compared with Glasgow and Scotland) and so are not shown here.

External causes: this grouping includes deaths from suicide (presented separately below) but also a range of other factors (e.g. road traffic accidents, violence, falls, fires). Mortality rates for this set of causes have not changed notably over time in Glasgow, Scotland, nor the intervention areas: this is broadly true for males (Figure 32) and females (Figure 33).

Figure 32

Figure 33

Age-standardised mortality rates: external causes, all ages, FEMALE
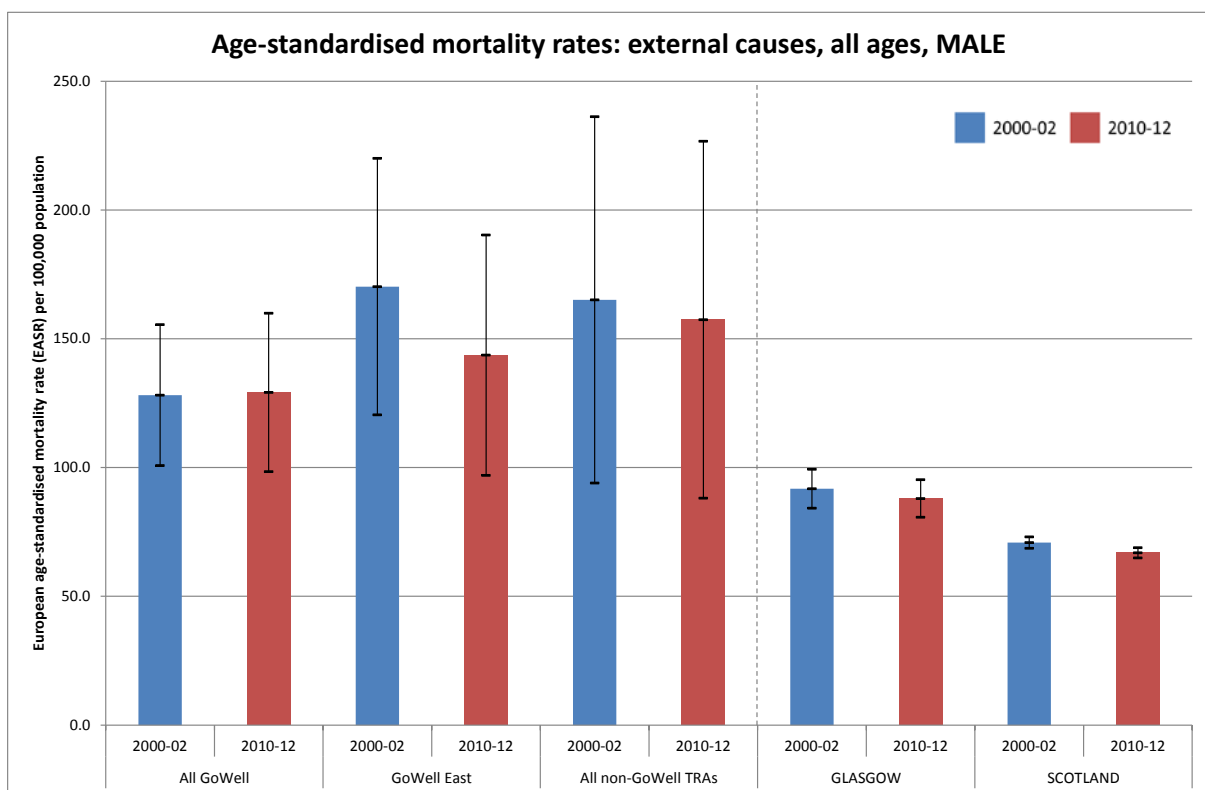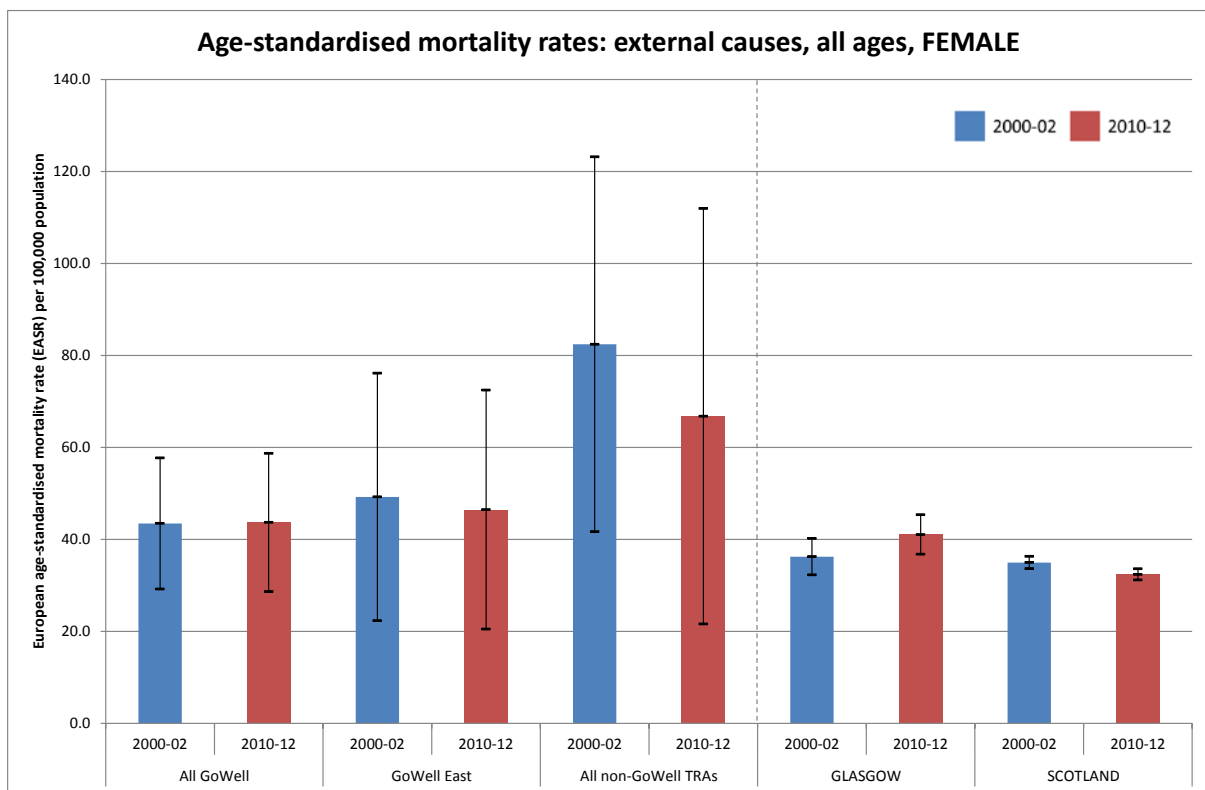
Figures 34 and 35 again confirm the difficulty of interpreting change over time at the level of GoWell area type.

Figure 34

Age-standardised mortality rates: external causes, all ages, MALE
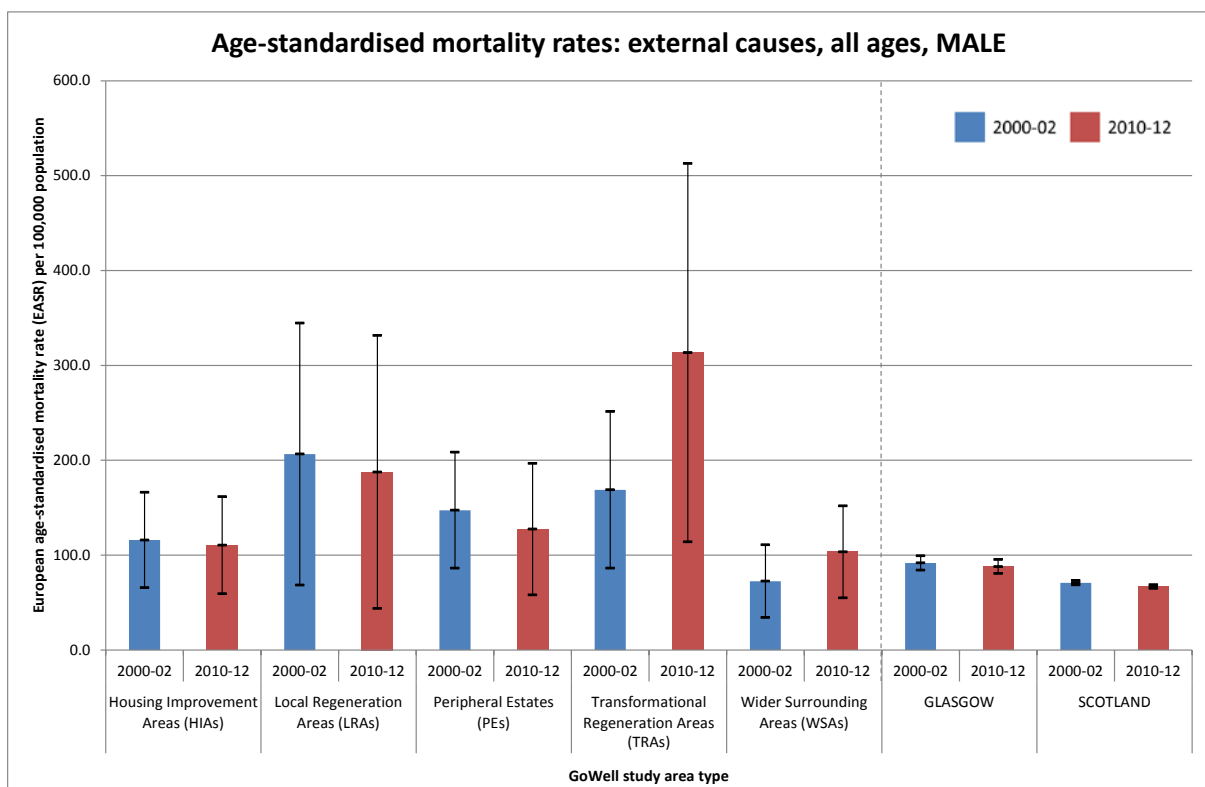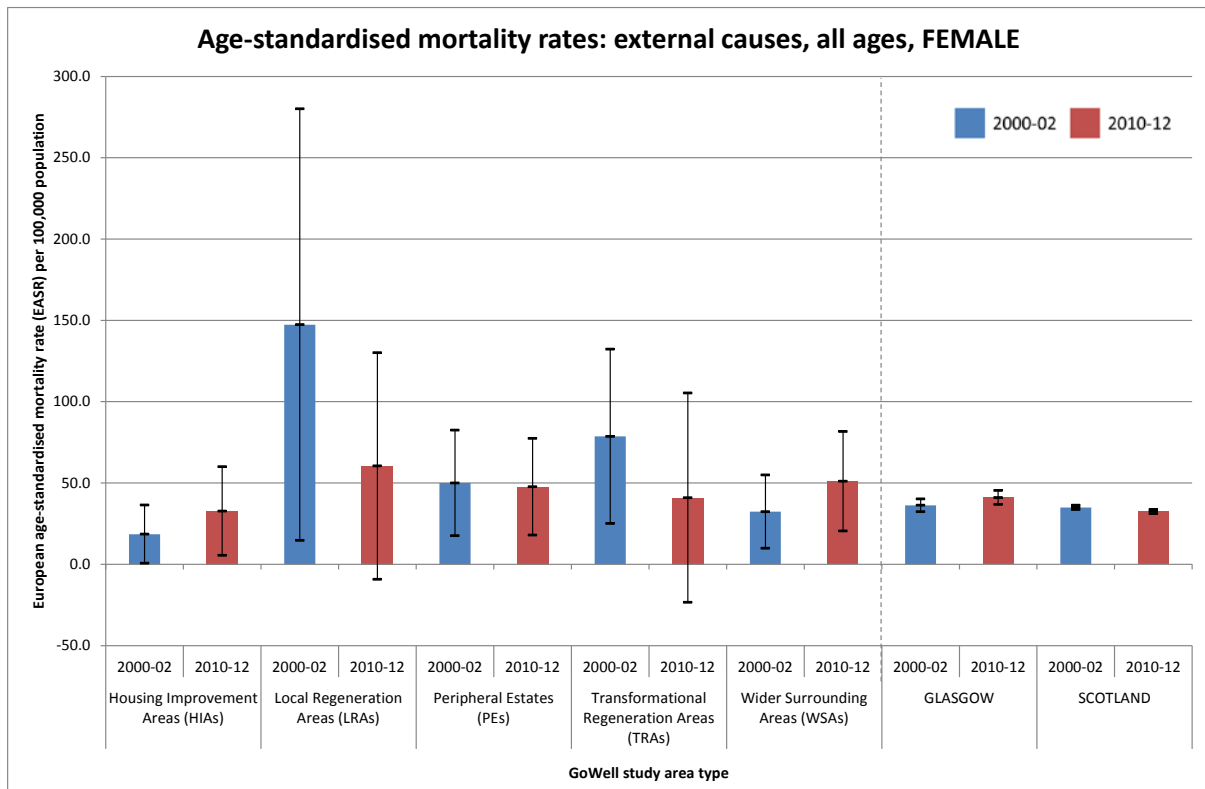
Figure 35

Suicide (including deaths of undetermined intent): Figures 36 and 37 show that the reductions in suicide mortality between 2000/02 and 2010/12 that were observed at the city and national level were not always replicated in the areas being studied, where rates also tended to be higher.

Figure 36

Age-standardised mortality rates: suicide, all ages, MALE

Figure 37

Age-standardised mortality rates: suicide, all ages, FEMALE
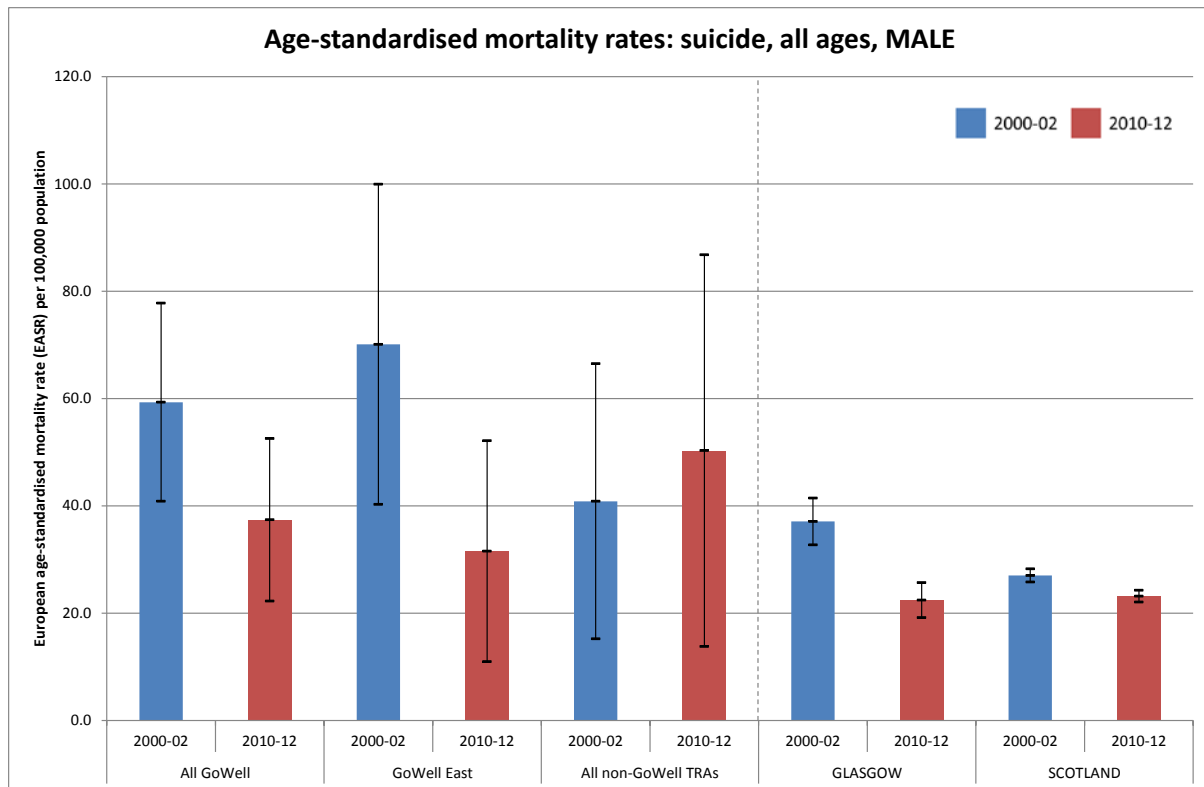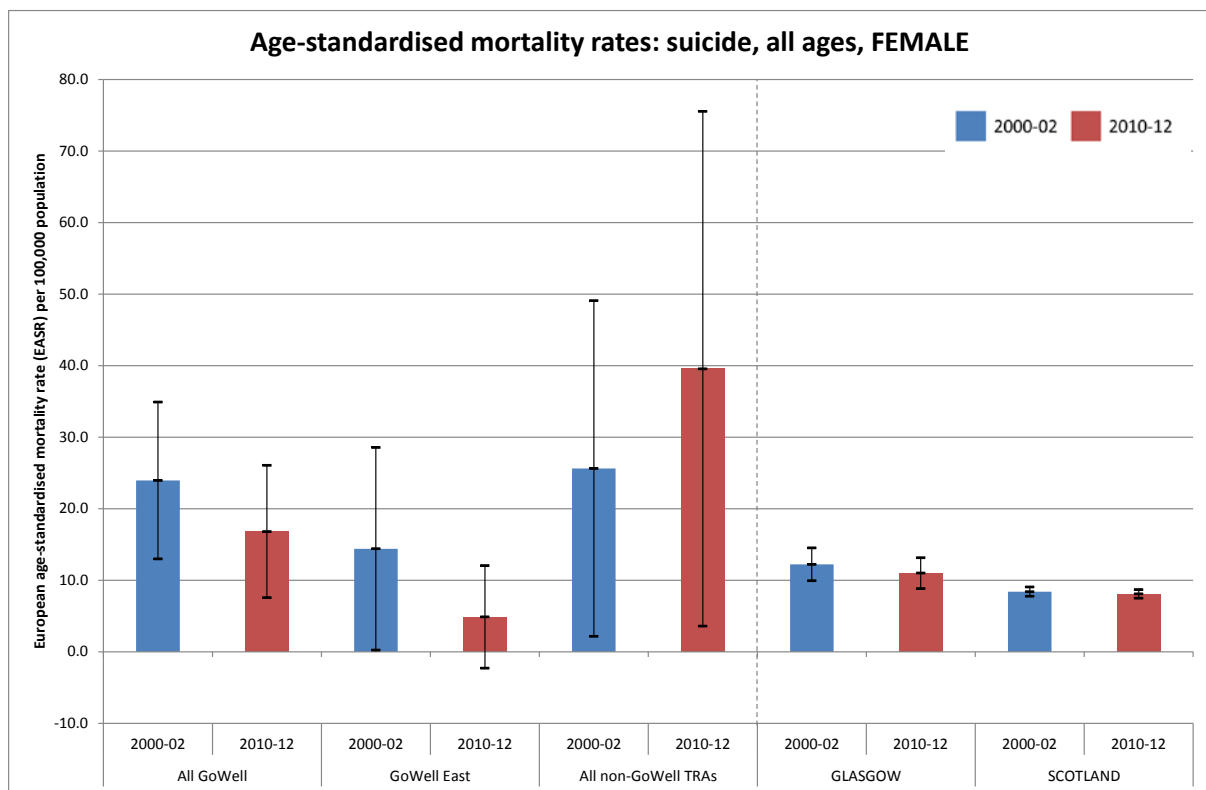
Alcohol-related mortality: there were notable decreases in this cause of death over the time period examined, both in Scotland (-24% for men, -17% for women) and Glasgow (-36% and -30% respectively). Such decreases were generally replicated across the intervention areas (Figures 38 and 39), especially so for male deaths in the GoWell East area (Figure 38).

However, it is still evident how much higher the rates of alcohol-related deaths are in the housing and regeneration areas compared with Scotland as a whole, even in the later period (and especially for men).

Figure 38

Age-standardised mortality rates: alcohol-related, all ages, MALE

Figure 39

Age-standardised mortality rates: alcohol-related, all ages, FEMALE

Drug-related poisonings: nationally, mortality from this cause increased over the period among both males (31%) and females (37%). In Glasgow, an increase was observed for women (39% - albeit that small numbers mean this was not statistically significant), but not men, for whom there was a small (-8%) decrease. Small numbers of deaths make interpretation of change over time in the various area types difficult (Figures 40 and 41)[xiii], although the decrease in rates in GoWell East – although not statistically significant – is still potentially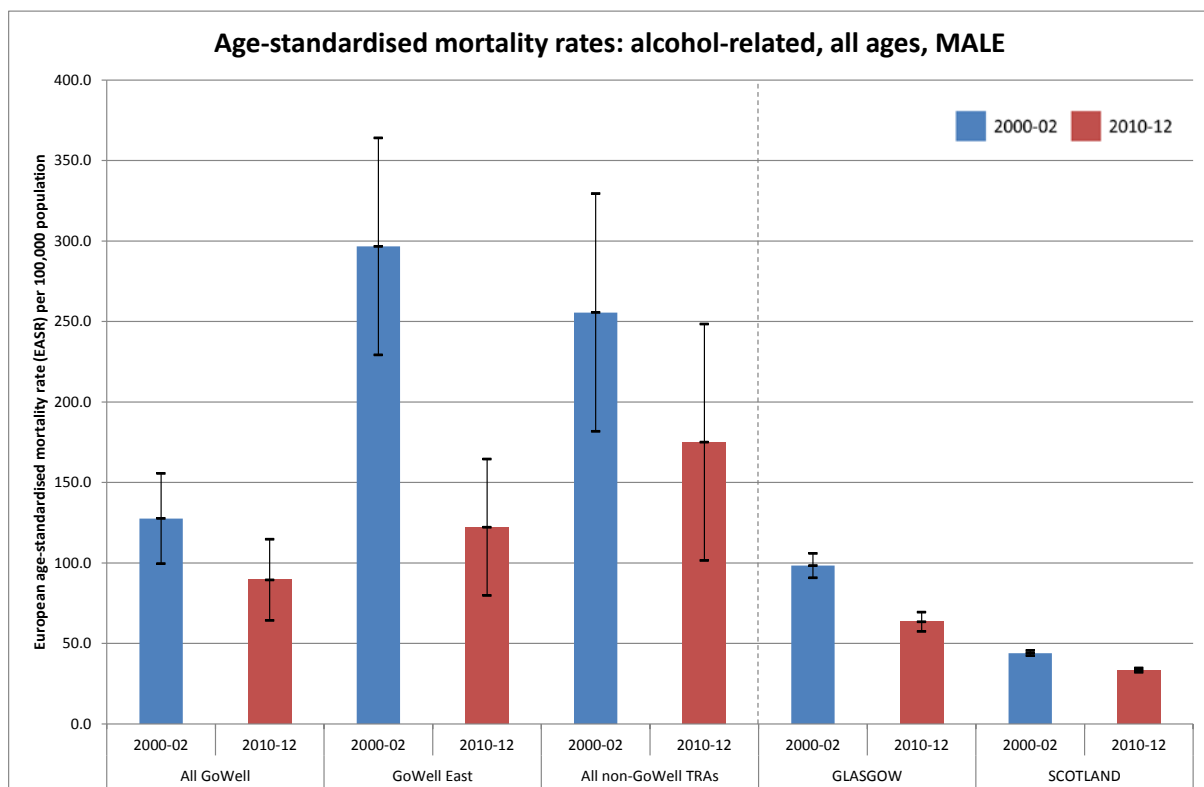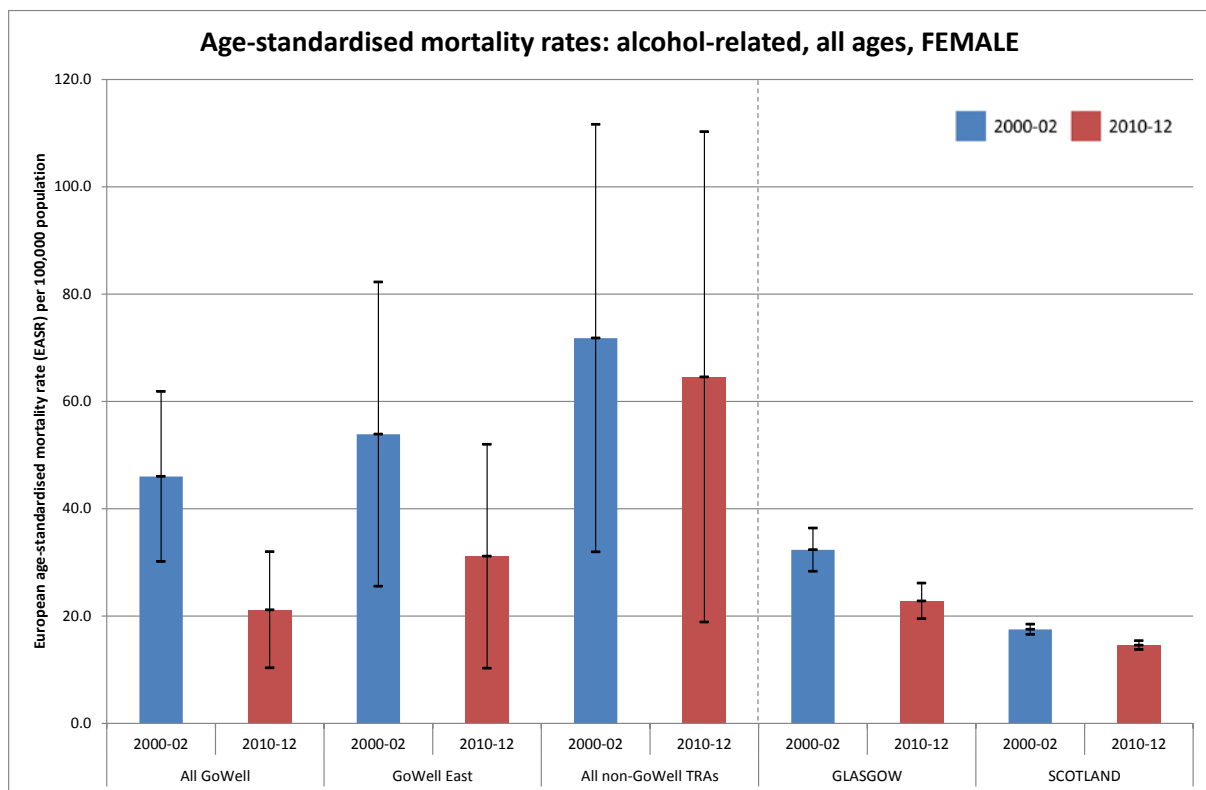 of interest. However, as with alcohol-related mortality, rates from this cause of death remain much higher than the equivalent figures for Scotland (especially among men).

Figure 40

Age-standardised mortality rates: drug-related, all ages, MALE
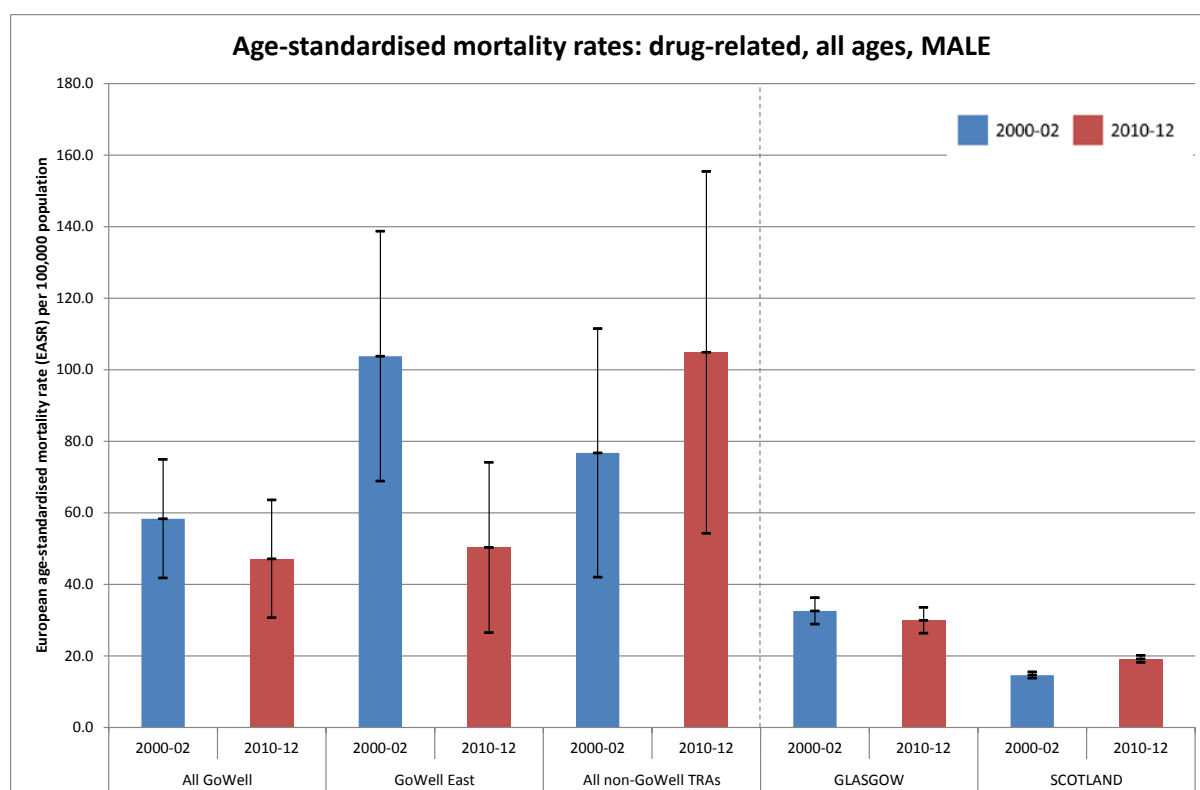
[xiii] Note, for example, the apparent increase in the mortality rate among males in non-GoWell TRAs. The overlapping 95% confidence intervals suggest this is not a meaningful increase, and indeed closer inspection of the data shows that there were a total of 19 deaths in the first three-year period, and 17 deaths in the second. However, the large decrease in population size resulted in an increase in the rate between the two points in time. Thus an apparent increase is in fact based on a reduction from an average of around six deaths per year to around five deaths per year, accompanied by a change in the population size.

Figure 41

Age-standardised mortality rates: drug-related, all ages, FEMALE
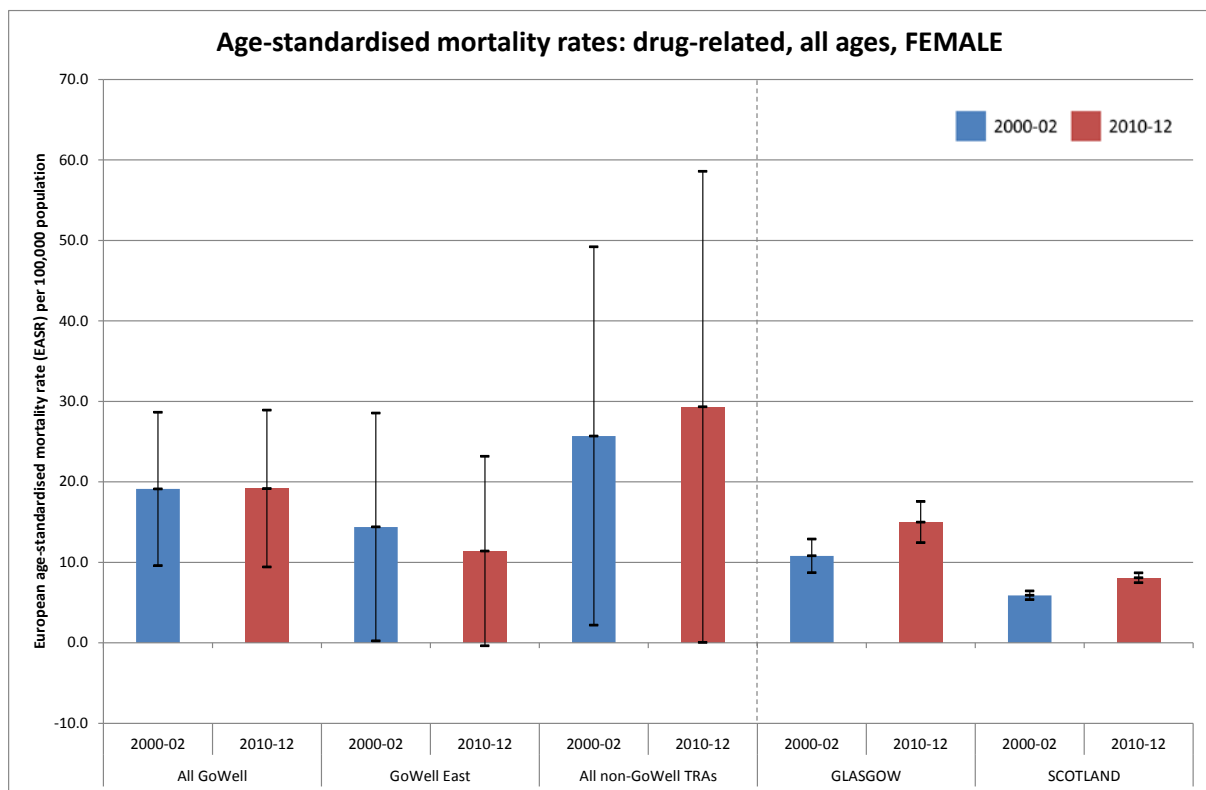
Discussion

General findings

The analyses of change over time for a number of different health outcome indicators show that, in general, levels of improvement observed within housing improvement and regeneration areas in Glasgow have been similar to those seen in the city as a whole, and to those observed at the national level. This is true of, for example, trends in life expectancy, and rates of death from causes such as diseases of the circulatory system (heart disease, stroke) and alcohol-related causes. However, for the majority of the analyses presented, it is difficult to draw any more detailed, robust, conclusions simply because (as a result of small population sizes and numbers of events) most changes are not 'statistically significant'. The notable exceptions to this are: male life expectancy (and all-cause mortality) in the GoWell East area, male and female mortality from circulatory system diseases in GoWell East and the non-GoWell TRAs, and male mortality in GoWell East.

For other health-related indicators (breastfeeding, maternal smoking, teenage pregnancies), rates of improvement in the areas studied have been notable, in many cases matching or surpassing levels of improvement at the city and, especially, national level. In these cases many of the changes are 'significant': for example, reductions in teenage pregnancy in GoWell East, non-GoWell TRAs, and the majority of individual area types; increased breastfeeding rates in GoWell East and non-GoWell TRAs; and reductions in maternal smoking in GoWell East, non-GoWell TRAs, and all area types except HIAs.

The focus of all these analyses has been primarily descriptive, and has not specifically assessed changes in the *relative position* of housing intervention areas compared with Glasgow and Scotland. Nonetheless with broadly similar rates of improvement in most health outcome indicators (particularly mortality), it is unlikely that there have been any major changes in relative position over the ten-year period analysed. That said, for certain outcomes and certain areas (e.g. male life expectancy in the GoWell East area), rates of improvement have surpassed those recorded at the city or country level, while clearly for the above maternity-related indicators, the relative position of the majority of the housing areas will have improved considerably. As discussed below, however, interpretation of reasons for any such above-average improvement is difficult.

Strengths and weaknesses

The main strengths of these analyses lie with the data sources: covering whole populations and based on quality-assessed recording systems, they provide a robust (albeit partial) picture of health-related issues in the areas under consideration. The use of census geographical units and associated population data mean the analyses are less subject to the population denominator biases associated with the use of CHI data (utilised in the 2008 report).

However, there are clear weaknesses, including the fact that the small number of events (e.g. deaths from particular causes), small population sizes, and the changing composition of many areas, make interpretation of the meaning of changes in many indicators difficult.

As one example of this, Figure 42 presents a very simple comparison, at the level of individual GoWell study area and non-GoWell TRA, of percentage change over time in population size (positive or negative) with the percentage change in all-cause mortality rate (positive or negative)[xiv]. This is simply to illustrate that in many cases, greater changes in health outcomes happen to be observed in areas where there have been greater changes in population size. This adds to the uncertainty of whether any observed reductions in rates represent improvements in health among the resident population, or whether instead the figures are influenced by changes in the *composition* of that population.

Figure 42

Change in population size vs change in mortality rates, selected areas 2000/02 - 2010/12
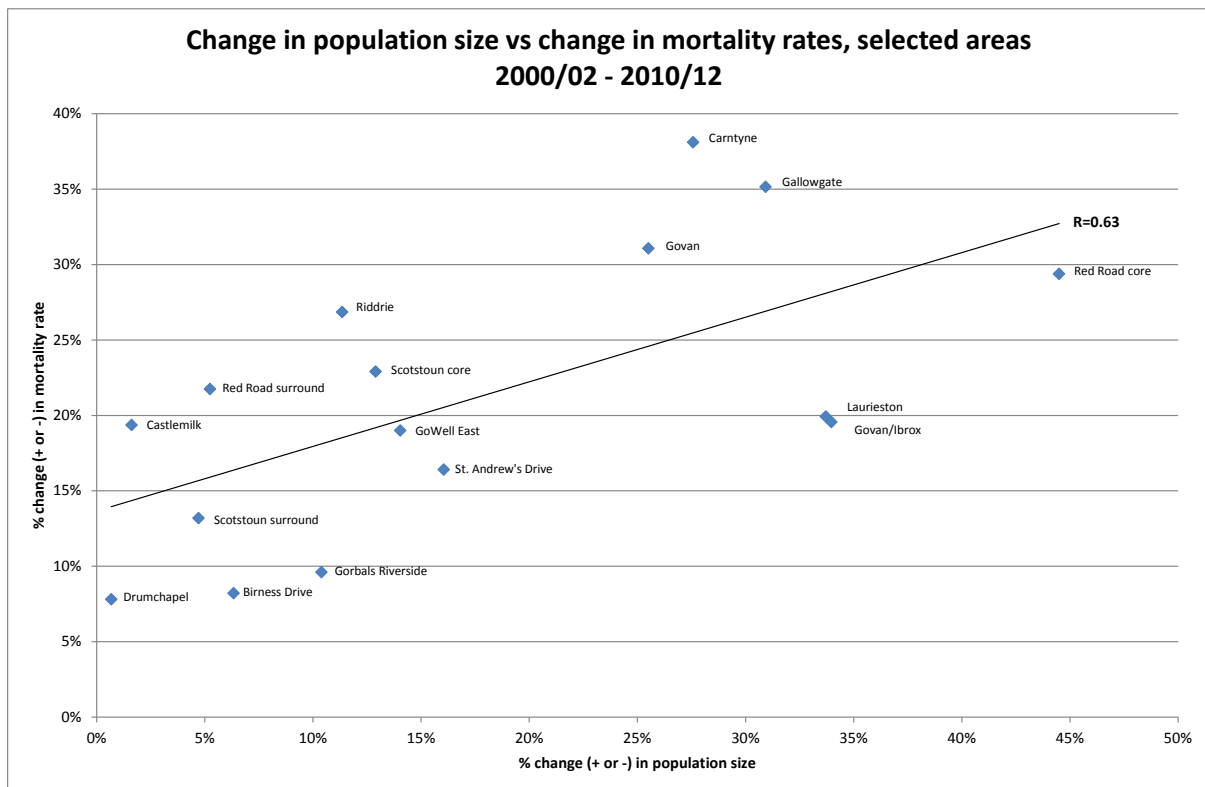
The fact that the analyses are based on just two points in time adds to this uncertainty. Changes between two time points may simply reflect fluctuation in rates, rather than meaningful variation over time. The limited time frame is also problematic, especially given the fact that housing improvement activities did not begin until several years into the period analysed. As stated in the introduction, many of the selected indicators are more suitable to analysis over a much longer time period, and of course, cross-sectional, non-longitudinal, ecological analyses mean that we can say nothing about any form of causality. For all these reasons it is problematic to attribute any observed changes to aspects of housing improvement or regeneration in the areas.


[xiv] Note that, for simplicity, absolute values have been used i.e. all percentage change figures are shown as positive values, not a mix of positive and negative.

Assessing the contribution of regeneration to changes in health inequalities

The challenges of attribution are faced more generally within GoWell. As stated earlier, one of the aims of the project is 'to monitor the effects of regeneration policy on area-based health and social inequalities across Glasgow'. However, it is extremely difficult to do this. This is for a number of reasons.

First, using the theory of causation of health inequalities (see Figure 43 below), which currently underpins the work on inequalities at NHS Health Scotland[16] (and is in turn based on an established understanding of the causes of inequalities highlighted by international experts[17-21]), it is clear that holistic regeneration programmes have enormous potential in supporting the development of more cohesive communities, improving housing conditions, increasing secure employment and providing good quality public services, all of which are important determinants of health. In reality, however, regeneration programmes to date have tended to focus on changes to the physical environment component of 'wider environmental influences'[22, 23], particularly housing, and to underestimate or not fully account for social issues and wider economic factors. Little evidence has been found of regeneration programmes explicitly focusing on other aspects of the wider environmental influences or on the fundamental causes of inequalities. This theory of causation provides an evidence-based framework which could help shape future regeneration approaches to maximise the likelihood that they will have an impact on health inequalities.

Figure 43

Health inequalities: theory of causation (summary version)

Source: Scottish Government 2014[24]
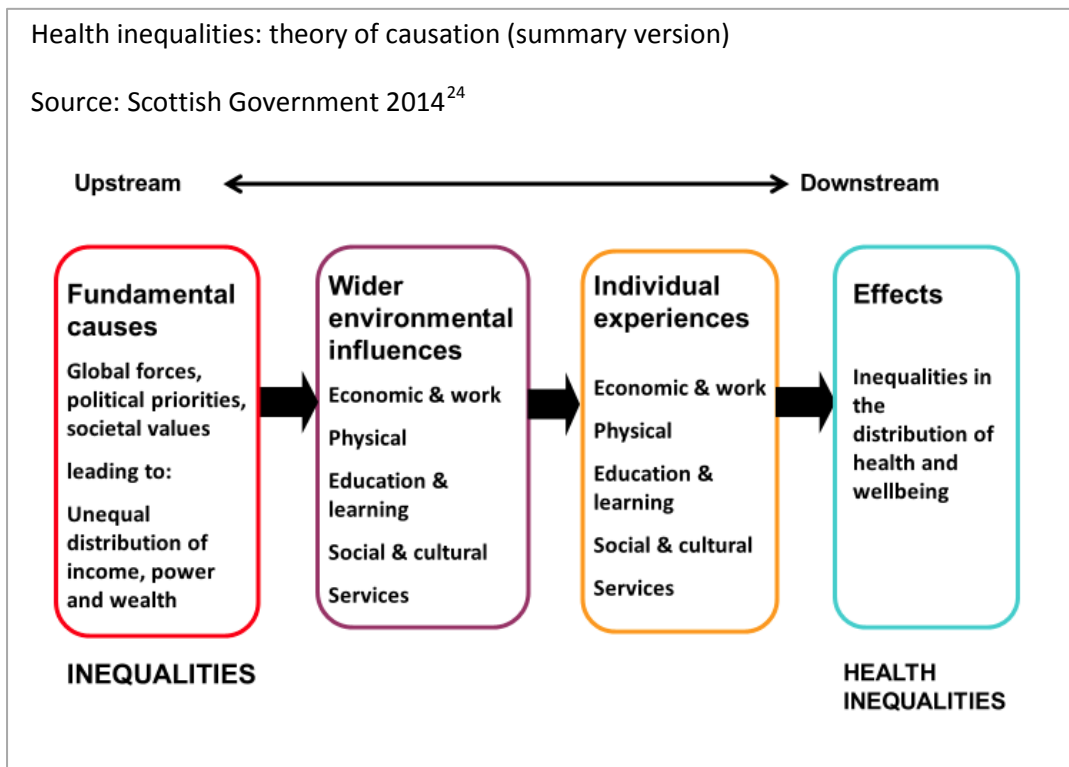
Second, economic growth was one of the main aims of the regeneration plans that GoWell was established to research, as this was seen as a key means of addressing the high levels of poverty in

the communities involved[25]. The regeneration itself was primarily housing-led, but within a holistic approach in line with existing national and local policies. For a number of reasons including the changed economic context and related political decisions, the regeneration did not proceed as planned and took longer than anticipated, particularly in the areas designated for regeneration on the greatest scale (i.e. demolition and rebuild). As a result, it has not been possible for GoWell to learn as much about the impact of these developments within the study period as had originally been anticipated.

Third, although the regeneration programme was intended to contribute to a reduction in poverty in some of the most deprived communities in Glasgow, and by implication, to a reduction in social and health inequalities at the city level, the nature and expected pathways by which this was to be achieved were not explicitly laid out at the outset of the regeneration programme. The regeneration programme may have influenced inequalities at different levels: between the study areas as a whole (i.e. areas of concentrated deprivation) and the rest of Glasgow; between the different study areas or area types; and/or between population groups within the study areas. However, there are a number of issues that limit the extent to which it is possible to assess changes in any of these. These include the population changes discussed earlier in this report, and the time lag between interventions, changes in determinants and any resulting impact on inequalities.

Finally, GoWell research and learning to date is extensive and wide-ranging, and offers important insights into the process and impacts of the regeneration programme. However, in reviewing the published GoWell outputs relating to the longitudinal cohort[xv], there is little evidence of differential changes between population groups in health, indicators of health, or other manifestations of inequalities. Nonetheless the evidence that does exist[26] offers some early and tentative signs that the regeneration programme may be contributing to slight reductions in the inequality gap: for example, that the greatest investment has been in households with greatest need, and that residents in the areas receiving higher investment experienced greater improvements in average mental health scores

Findings from the wave 4 survey, and specifically the longer period of longitudinal data available, will help to address this final point. In addition, there are clear potential benefits in seeking to follow-up residents (particularly those from TRAs) over a longer period of time to enable impacts of the full regeneration processes to be assessed.

[xv] Research relating to the longitudinal cohort relate more specifically to the impact of regeneration over time than the cross sectional studies that provide information at a single point in time.

Conclusions and recommendations for further research

Welcome improvements in a range of health-related indicators have been observed in areas undergoing regeneration in Glasgow over the period 2000/02 to 2010/12. Although for outcomes such as mortality and life expectancy, rates of improvement have been similar to those seen for Glasgow and Scotland – and thus, in general terms, these areas still lag behind the city and country – for a number of important maternity-related indicators, improvements have exceeded those observed at the national level and, for some specific areas, those also observed for Glasgow. However, in many cases, changes in those, and other, indicators are greatest in areas which have also experienced considerable change in population size, making interpretation of the data problematic. Furthermore the nature of the analyses prevent any causal attribution.

To elicit a greater understanding of the meaning of some of the trends presented here, and of broader changes in the study areas more generally (which might partially address the issues highlighted in relation to assessing the impact of housing regeneration on health inequalities), a number of further research questions (with associated analyses) could be asked:

1. Can GoWell identify whether there has been a relative change in any **indicators of social inequalities** over the study period: between the study areas and the rest of Glasgow; between study areas; or between population groups within study areas? For example, changes in employment status, educational attainment, perceptions of antisocial behaviour and feelings of safety.

2. If any relative changes have been observed, to what extent can these be attributed to the regeneration interventions in the study areas? For example:

- How has transport infrastructure changed in the study areas over the study period? And how has traffic volume changed in GoWell areas?
- How has tenure mix influenced property values in the regeneration areas? And how have the poorer households faired in areas of mixed tenure?
- How has commercial activity in GoWell areas changed over the period and to what extent can these businesses be considered to be potentially health enhancing/damaging? And has there been a change in where they draw their staff from i.e. do local employers employ local people? And how has the density of outlets selling tobacco, fast food, and alcohol changed? And betting shops and money lenders?
- How has service provision changed in the study areas, i.e. access to social support services and health services changed; education provision (school and lifelong learning); leisure services?
- How has the presence of vacant and derelict land changed in GoWell areas?
- How has the population in the area changed over the study period?

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