# Multi-scalar influences on mortality change over time in 274 European cities

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**ABSTRACT**

Understanding determinants of urban health is of growing importance. Factors at multiple scales intertwine to influence health in cities but, with the growing autonomy of some cities from their countries, city population health may be becoming more a matter for city-level rather than national-level policy and action. We assess the importance of city, country, and macroregional (Western and East-Central Europe) scales to mortality change over time for 274 cities (population 80 million) from 27 European countries. We then investigate whether mortality changes over time are related to changes in city-level affluence. Using Urban Audit data, all-age all-cause standardised mortality ratios (SMRs) for males and females were calculated at three time points (wave one 1999-2002, wave two 2003-2006, and wave three 2007-2009) for each city. Multilevel regression was used to model the SMRs as a function of survey wave and city region gross domestic product (GDP) per 1000 capita. SMRs declined over time and the substantial East-West gap narrowed slightly. Variation at macroregion and country scales characterised SMRs for women in Western and East-Central European cities, and SMRs for men in East-Central European cities. Between-city variation was evident for male SMRs in Western Europe. Changes in city-region GDP per capita were not associated with changes in mortality over the study period. Our results show how geographical scales differentially impact urban mortality. We conclude that changes in urban health should be seen in both city and a wider national and macroregional contexts.

**KEYWORDS:** Cities, European Union, health policy, longitudinal, mortality, urbanisation

## BACKGROUND

The World's urban population is forecast to reach almost 5 billion by 2030 (Fragkias et al., 2013). Over 70% of Europe's 740 million inhabitants already live in cities (United Nations, 2013, 2014). Population health in Europe, and globally, is increasingly determined by the health of city dwellers. Whilst we know that there are substantial variations in health status between the countries of Europe (Leon, 2011; Mackenbach et al., 2013; Richardson et al., 2014), it is not clear whether these associations are replicated between cities across Europe.

There are reasons why the health status of cities might be different to that of the rest of a country. Historically this possibility was reflected in the debate over the existence of an urban penalty or an urban advantage (Moon & Kearns, 2014; Vlahov et al., 2005). In contemporary Europe many cities have now become increasingly dissimilar from their countries due to starkly different trajectories of demographic and economic development (Brenner, 1998; Salet et al., 2003). Younger more affluent urban areas may hold a health advantage; conversely urban economic crises and ageing city populations may link to poorer health. Further, in recent years there has been a devolution of resources and policy responsibilities to the city or regional level in many European countries, including the UK, Belgium, Italy, and Spain (Scully & Jones, 2010; Telò, 2014). Key decisions on health-related policy realms, that were once the preserve of central governments, are now often taken at the city level, albeit within a national framework. As a result, cities may develop health-influencing characteristics that are distinct from the rest of their country and/or from other cities within the same country: different labour markets, infrastructure, physical environments, and health care provision. Together, these contentions suggest the importance of geographical scale in the study of health outcomes (Kim & Subramanian, 2016).

Two broader structural influences overlay the juxtaposition of country and city as scales affecting the health of city residents. First, and of particular relevance in the European context, supranational groupings of countries, or ‘macroregions', differ in their social and economic development trajectories. The major divide in health between Western Europe and the Central and East-Central European countries of the former Soviet bloc has been well documented, reflecting historical political and economic divisions (Marmot, 2013). Population health in Central and East-Central Europe remains generally worse than in the West, although there are indications that it is improving rapidly in some countries (Leon, 2011; Vågerö, 2010).

Second, and more generally, whilst a range of social, political and environmental factors are likely to influence health in European cities, affluence is likely to be a major determinant of differences in urban health (Borrell et al., 2013). Associations between affluence and population health are well established between countries (Marmot, 2005; Pearce & Dorling, 2009), but the extent to which the uneven changes in health across European cities are a function of changes in affluence is less clear. Addressing this omission is important because a better understanding of the relationship between trajectories in health and affluence will assist in identifying policy levers for improving health and reducing inequalities across Europe.

In this paper we use novel data to investigate the extent to which changes in the health of city populations across Europe reflect variations at the 'city-level', the 'country-level', and the macroregion (East-Central or Western Europe), and taking into account changing affluence. Comparisons of health between the cities of different European countries have, to date, been cross-sectional and have either focussed exclusively on cities in Western Europe (Baccini et al., 2008; Gray et al., 2012), or included only a small fraction of East-Central European cities (Gotsens et al., 2013; Katsouyanni et al., 2001). The relative contribution of city-, country-, and macroregion to city health trajectories is unknown and there has been limited specific focus on city health. Our research questions were thus: i) how do variations in city mortality over time differ in relation to the city, country, and macroregion scale?, and ii) are variations in urban mortality over time related to variations in the affluence of the area in and around the city?

**METHODS**

We conducted a repeated measures panel study of city-level mortality over three waves of the European Urban Audit. Assembling and curating our data was a substantial task, which we outline first prior to describing our analytical strategy.

***Data***

The Urban Audit was established to provide reliable and comparable information about the characteristics of European urban areas with more than 50,000 inhabitants (termed 'cities'). It sought to represent at least 20% of the population of each country and included all capital cities, most regional capitals and a range of smaller cities. Three waves were available for analysis: 1999-2002 ('wave one'), 2003-2006 ('wave two'), and 2007-2009 ('wave three'). By wave three, the Urban Audit included cities in each of the then EU countries except Cyprus, plus cities in Croatia, Turkey, Norway and Switzerland. We excluded cities distant enough from the European mainland that they might be considered atypical (*n*=8; e.g., Funchal, Madeira (Portuguese);  Saint-Denis, Réunion (French)).

Urban Audit mortality and demographic data at each wave were obtained from Eurostat. This provided all-age, all-cause mortality counts by sex, city, and wave. Age- and sex-specific counts were not available, precluding direct standardisation. We calculated indirectly standardised mortality ratios (SMRs), standardised to 2001, to render rates comparable between cities and over time. For each wave and city we calculated the 'expected' number of all-age all-cause deaths, by applying average age group- and sex-specific mortality rates for a Europe-wide reference population from 2001 to the city's age group- and sex-specific population counts, and summing the result. The age groups were 0-4, 5-14, 15-19, 20-24, 25-34, 35-44, 45-54, 55-64, 65-74, and 75+. The reference population was that of the 21 Urban Audit countries providing complete data in the WHO Detailed Mortality Database (DMDB): Bulgaria, Croatia, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, and United Kingdom. The age- and sex-specific mortality rates for this population were considered to represent the best available approximation of average rates for the Urban Audit cities. Five UA countries with SMR data – Belgium, Italy, Ireland, Portugal, and Denmark – were absent from the reference population.  Their absence did not affect our subsequent results, therefore cities in these countries were retained in our analyses.  Each city's 2001-referenced SMR was calculated as (observed deaths)*100/(expected deaths). A value below/above 100 indicated a standardised mortality ratio lower/higher than the reference population average for 2001.

City-specific measures of affluence were not available in the Urban Audit. We obtained gross domestic product (GDP) per capita from Eurostat for the wider 'city-region' in which each Urban Audit city was situated. City-regions were defined as level 3 of the Nomenclature of Units for Territorial Statistics (NUTS), a standard European unit for statistical reporting. On average, Urban Audit cities contained 53% of the population of their host NUTS3 area. GDP was expressed in purchasing power standards, an artificial unit of currency enabling comparisons of GDP across countries with different currencies and costs of living. Average GDP per capita was calculated for the years covered by each wave. Wave one GDP per 1000 capita was averaged over 2000 to 2002 due to missing data in 1999.

***Data quality***

Urban Audit data were collated from multiple countries with differing mechanisms and standards of statistical reporting, hence data quality was a concern and we checked the datasets extensively. Outlying SMR values (>2 standard deviations from expectations based on regional (NUTS2) or national mortality rates) were deemed suspect. Wave one mortality data for Spanish cities (*n*=13) were excluded as a result, as well as a further 3%, 2%, and 5% of other cities with SMRs for waves one, two, and three, respectively. Missing GDP data resulted in the exclusion of cities in Norway, Switzerland and Turkey as well as all bar one city in Italy. The online supplementary data table gives details of excluded and included cities. The resulting dataset represented an average of 80 million people at each wave for

218 cities in wave one, 257 in wave two, and 196 in wave three. A total of 274 cities were represented in the dataset with 144 cities present in all waves.

***Analyses***

We chose to run separate models for East-Central and Western European cities, given the well-established European health divide between Western Europe and the countries of the former Soviet bloc (Mackenbach et al., 2013). East-Central European cities were those in Estonia, Latvia, Lithuania, Poland, the Czech Republic, Slovakia, Hungary, Romania, Slovenia, Croatia, and Bulgaria plus those located in the former German Democratic Republic (n=5; recreated as a country for the purposes of analysis). We also conducted separate analyses by sex in recognition of the clear evidence of disparities in health between men and women (Bambra et al., 2009). Our decision to pursue stratified analyses reflected a desire to ease interpretation and recognise distinctive geographical processes and gendered differences in the experience of mortality. An alternative strategy modelling a single large dataset and testing for interactions by macroregion and gender would have added needless complexity to our modelling.

Multilevel linear regression models were used to model city-level SMR variation while accounting for the nesting of repeat observations (waves) within cities within countries. Multilevel modelling can address 'unbalanced' data (we had variable numbers of repeat observations per city) and produce accurate and precise estimates of variation at the city and country level taking account of the clustering within the data; multilevel models are computationally far more efficient than proceeding with multiple dummy variables at city and country level (Goldstein et al., 1994). We first ran a null model that estimated the SMR for wave *i* in city *j* in country *k* with no predictors. We then added an indicator of wave as a fixed effect, using a single order orthogonal polynomial allowing the wave indicator to be treated as a continuous variable; next we allowed the slope of our wave indicator to vary between cities and between countries. Finally GDP per 1000 capita was added as an additional fixed effect and tested for random intercepts and slopes at the city level; random slopes proved unnecessary. We report results for our final models, which took the form:

$$SMR_{ijk} = \beta_{0ijk} + \beta_{1jk} wave_{ijk} + \beta_3 GDP_{ijk}$$

Where $\beta_{0ijk} = \beta_0 + v_{0k} + u_{0jk} + e_{0ijk}$ (with *v, u* and *e* denoting random intercepts at each level: country, city and wave)

And $\beta_{1jk} = \beta_1 + v_{1k} + u_{1jk}$ (with *v* and *u* denoting random slopes for wave at country and city levels)

Models were fitted using MCMC methods, in MLwiN version 2.35 (Browne, 2015; Rasbash et al., 2015). The modelled variances at country, city and wave levels were summed and the percentage of variance at each level was calculated to indicate how the variability in SMRs was partitioned. A pairwise comparison of means test was used to examine differences in the modelled SMRs between groups. We tested for residual heteroscedasticity and other assumptions using graphical diagnostics and found no significant problems; re-running models with logged outcomes confirmed our results and upheld this position.

## RESULTS

***i) How do variations in city mortality over time differ in relation to the city, country, and macroregion scale?***

Average fitted SMRs are presented in Figure 1. At wave one, fitted male SMRs averaged 90.904 (86.193 - 95.613) and 129.450 (113.751 - 145.753) in Western and East-Central European cities respectively. The corresponding fitted SMRs for females were 94.123 (87.545 - 100.661) and 114.668 (103.845 - 125.390). Pairwise comparisons of means showed that the fitted SMRs for Western European cities were significantly lower than those for East-Central European cities throughout the period: the difference for males was 38.55 points in wave one, reducing to 26.51 points in wave three. For females it was 20.55 points in wave one and 15.87 points in wave three. SMRs generally fell over time: pairwise comparisons of means showed that the fitted SMRs for wave three were significantly lower than those for wave one for all groups except Western European females. On average SMRs decreased by 17.63 (14.4 to 22.4) and 6.85 points for East-Central European males and females, respectively, and by 5.59 points for Western European males.

(Figure 1 here)

The partitioning of SMR variance between the country, city and wave levels is indicated in Table 1. For males in Western European cities, the city-level (51.6% of variance) was more important than the country-level (40.6%). The opposite was found for females from both East-Central and Western Europe and for East-Central European males (<19.0% of the variance in the SMR was at the city level, and >76.0% at the country level).

(Table 1 here)

Table 2 presents the results from the multilevel models that underlie the above figures. Wave was significant as a fixed effect on SMR only for men and the gradient of the decline in SMR over time was stronger in East-Central Europe than in Western Europe. There were significant differences between countries in Western Europe with respect to the average SMR for women, and significant between-country variations in the slope of the association between wave and SMR for Western European women. Other random coefficients at the country level were not significant. All models showed significant between-city variation, but there was no evidence for significant variations at the city scale in the slopes of the association between wave and SMR. The only covariance term within the models to reach statistical significance suggested convergence of SMRs over time in East-Central Europe at the country level.

***ii) A*re variations in city mortality over time related to variations in city affluence?**

Table 2 also provides results for our second research question. In both East-Central and Western European cities an increase in GDP per 1000 capita was associated with statistically non-significant decreases in SMR after adjusting for the effect of wave. These reductions were marginally greater for men than women but still statistically non-significant. Further tests for interactions between wave and affluence and for random variation in the effects of affluence were not significant, did not impact model parameters and are not presented here.

## DISCUSSION

We compared mortality change over time (1999 to 2009) for 274 cities in 27 European countries. These cities are home to approximately 80 million people, making this the largest study of changing urban mortality in Europe to date. City-level mortality decreased over time, but the East-West mortality gap, evident previously mainly in national comparisons (Leon, 2011), has additionally been shown to persist at the city level across our period of analysis.

Between-country differences explained more of the decline in urban women's SMRs than between-city differences, whether in East-Central or Western Europe, suggesting that country-level factors – such as welfare state provision or educational policy – have a greater influence on the mortality trajectories of female city dwellers than city-level factors. The importance of such country-level factors in explaining international differences in urban health provides a large-scale confirmation of previous research on the importance of national social policy to women's health (Bambra et al., 2009; Eikemo et al., 2008; Jamison et al., 2007; Niedzwiedz et al., 2016; Safaei, 2009). We extend this work by showing that, while national factors may impact female SMRs most, significant differences in that impact between countries are only evident in Western Europe. We also show that, though SMR variation at the city level is less important than country-level variation (except for men in Western Europe), there is significant variation for both sexes between cities in both East-Central and Western Europe. This variation is greater for men and adds weight to contentions that cities are of increasing importance to understanding health variations in Europe (Verma et al., 2015), providing a counterpart to research on the significance of urban health in other contexts (Galea et al., 2005).

Our finding of significant between-city variation in SMRs takes account of trajectories over time and the potential influence of GDP. With this in mind, some cities emerge as outliers in our analyses. In Western Europe,  in line with previous work (Walsh et al., 2010), Glasgow and Liverpool (both UK) have much higher male and female mortality than expected on the basis of trend and GDP. The suggestion that higher SMRs might thus be associated with struggling post-industrial urban areas (Walsh et al., 2009) is supported by the presence of Lens (France) as another large positive residual. In East-Central Europe a similar pattern is evident with the deindustrialising Polish city of Łódź providing a clear positive residual for both men and women. Negative residuals, with lower than expected SMRs, tended to be smaller cities with tourism economies in East-Central Europe and service economies in affluent parts of Western Europe.

Over our relatively short study period, only male SMRs have declined significantly, with the sharpest decline evident in East-Central Europe. A non-significant decline for female SMRs in Western Europe masks significant variation between Western European countries, as well as variations between cities as noted above. Urban SMRs may be improving for men because men are advancing from a generally worse position and the more rapid improvement in East-Central Europe reflects the historic impact of East-West differentials (Bijak, 2013). Variation between countries in Western Europe for women is evident in higher than expected SMRs in the UK, Ireland, the Netherlands, Denmark and Greece and lower than expected outcomes in Spain and France. Gender rights and labour force participation may be implicated but these differentials require further research. Some studies suggest that men’s health is more susceptible to local labour market factors (Bellaby & Bellaby, 1999), while wider national influences (e.g., family-related policies) may have greater relevance for women’s health (Borrell et al., 2004; Chandola et al., 2004).

It is encouraging that falls in mortality ratios have been most rapid in East-Central European cities, leading to a narrowing over time of the East-West mortality gap for the cities included in the study. All East-Central European countries in our study were part of the EU by 2013, and most joined in 2004. EU enlargement, and the resulting large-scale migration to the West that it facilitated from many but not all East-Central European countries, might have been expected to widen East-West differences within the EU as international migrants tend to be healthier than those remaining in their country of birth (Gadd et al., 2006). Several factors may explain why this did not happen. Vågerö suggested that joining the EU resulted in health benefits for former socialist states, while those remaining outwith the EU continued to show increasing health disadvantage compared with the West (Vågerö, 2010). The extent to which these improvements were caused by EU membership, or coincided with it, is unclear but it is plausible that the processes of fiscal and policy alignment that preceded joining the EU, and the economic boost that followed, impacted particularly positively on cities. Equally, it is also possible that the improvements evident over the span of our study were the same as those experienced earlier in Western countries as a result of rising standards of living (Mladovsky et al., 2005).  Hence while our findings indicate narrowing of the East-West gap in mortality between the cities of EU countries, the broader East-West health divide between European countries is still a topic of concern (Mackenbach et al., 2013; Mackenbach et al., 2015).

The absence of a significant relationship between changes in affluence and changes in mortality over time was intriguing. We know that the association between affluence and health is a life-long process, with living conditions and environment in childhood continuing to hold influence on health for the remainder of the life span (Galobardes et al., 2004). The decade covered in this study was a brief period for changes in affluence to exert much influence on mortality rates, particularly if effects were lagged. Our GDP measure may also have been acting as a proxy for multiple aspects of the urban environment, including labour market conditions and stability.

Despite the known association between affluence and health-related behaviour (eg. Chaix & Chauvin, 2003), our GDP measure may also have failed to pick up city-level aggregations of compositional factors. While it was not an objective of this paper to inquire into the multiple determinants of urban health beyond the key affluence variable, we know that individual-level factors such as smoking and drinking are stronger determinants of health than contextual factors but individuals with similar behaviours tend to aggregate spatially (Pickett & Pearl, 2001). Hence collective behaviour is likely play a part in determining city health. Moreover, there is a wealth of evidence to indicate that 'lifestyle' factors (including the consumption of alcohol, tobacco and highly-processed food) are heavily influenced by other contextual factors that vary between cities (see for example Barnett et al. (2016) on smoking and Witten and Pearce (2016) on diet and physical activity). Future work could usefully explore the importance of these, and other, city-level factors. The Urban Audit is a European-wide dataset that is appropriate for these analyses but further work will require the gathering of new data beyond the scope of the present study.

***Limitations***

Our work had a number of limitations. First, the data were sourced from separate national administrations, and some reliability issues were identified. To address this we carefully checked and omitted problematic data. Second, we selected all-age mortality counts because they were available for the largest number of cities but recognise that these will have been affected by population distribution differences between cities (e.g., older populations in some cities than others). Our indirect standardisation will have helped reduce the effect of  these age-structure differences. Third, cause-specific mortality or morbidity measures would have been more helpful in suggesting suggest potential causative pathways but were unavailable in the Urban Audit. Fourth, whole-country mortality data were used for standardising the city mortality rates because detailed city-level data were unavailable. Urban-rural health differences may have had an effect on the resulting SMRs.  Fifth, the GDP data we used generally pertained to larger areas than the cities they were intended to represent, particularly in the case of small cities. These areas (NUTS3 regions) are defined differently in each country. Hence, although unavoidable due to the absence of more complete data at the city level, detection of any influence of GDP on mortality ratios may have been compromised by this mismatch.

**CONCLUSIONS**

This study of mortality trends in European cities adds to our understanding of urban health in Europe, and may also have implications for global urban health. As many cities around the world become ever more economically and socially distinct from their countries, the temptation is to view their population health as a matter for city-level policy and action. Our study sustains this viewpoint but also suggests that we need to see urban health in its wider national and macroregional context, even in areas such as Europe that are dominated by large and powerful cities. The urbanisation of the world's population is occurring quickly and extensively; public health practitioners must be aware of that a range of geographical scales impact on the health of urban dwellers. The influence of city, national and supra-national scales reminds us of both the complexity of population health, but also the need to avoid single-scale approaches and policies to protecting and improving health.

**LIST OF ABBREVIATIONS USED**

EU European Union

GDP Gross domestic product

NUTS Nomenclature of Units for Territorial Statistics

SMR Standardised mortality ratios

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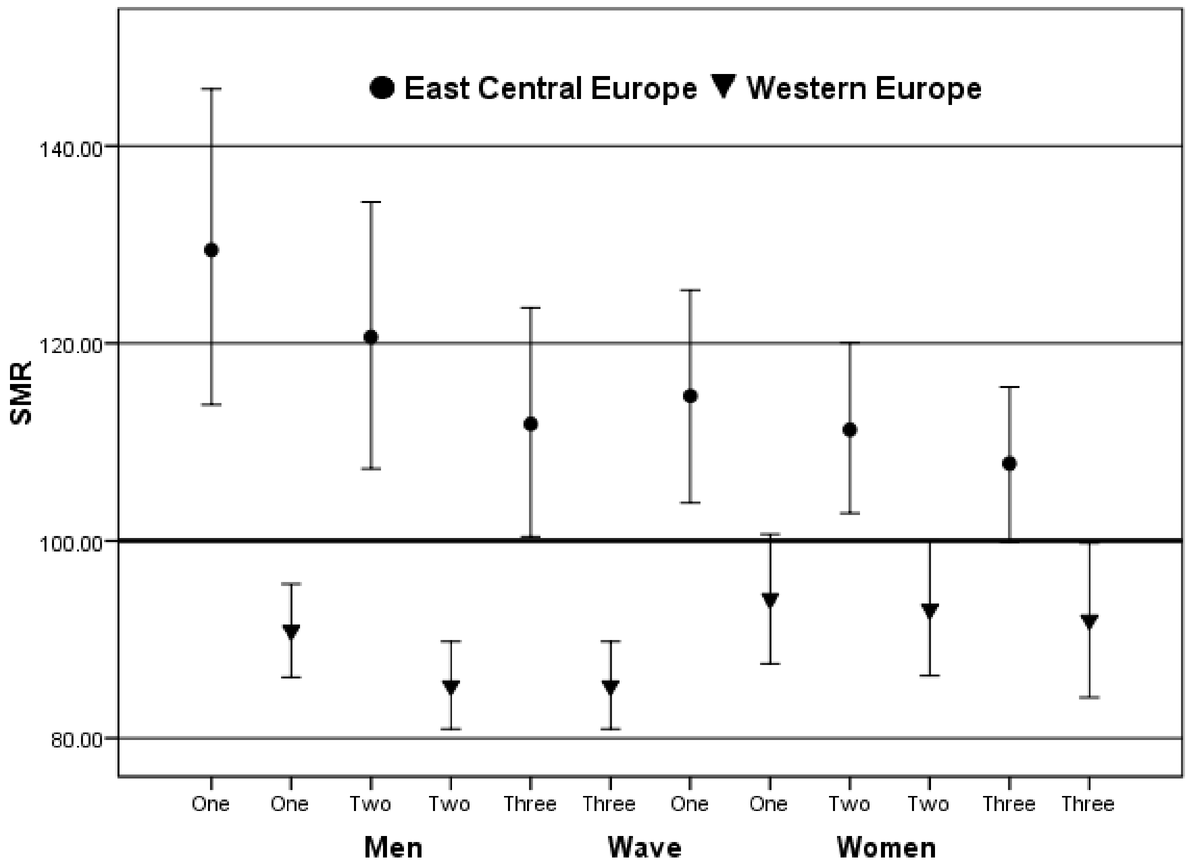
**Figure 1. SMR change over time: mean fitted SMRs for 179 Western European and 95 East-Central European cities, by sex, by wave.**




Footnotes:

Error bars indicate 95% confidence intervals.

Wave one: 1999-2002; wave two: 2003-2006; wave three: 2007-2009.

**Table 1. Partitioning of the variance in Standardised Mortality Ratios (SMRs) (%).**

| | **Male** | | **Female** | |
|---|---|---|---|---|
| **Level** | **Western Europe (n=401)** | **East-Central Europe (n=270)** | **Western Europe (n=416)** | **East-Central Europe (n=255)** |
| **Country** | 40.6 | 83.9 | 76.4 | 77.4 |
| **City** | 51.6 | 11.7 | 18.2 | 14.2 |
| **Wave** | 7.8 | 4.4 | 5.4 | 8.4 |
| ***Total*** | *100.0* | *100.0* | *100.0* | *100.0* |

n=total of SMRs in each model

**Table 2. Final Multilevel Model Results**

| | Western Europe | | East-Central Europe | |
|---|---|---|---|---|
| **Fixed part** | **Men** | **Women** | **Men** | **Women** |
| Intercept | 85.34 (2.20) | 92.96 (3.49) | 120.33 (7.07) | 111.14 (4.40) |
| Wave | **-7.94 (1.17)** | -1.58 (1.40) | **-12.38 (3.29)** | -4.84 (2.47) |
| GDP/1000 | -0.10 (0.06) | -0.06 (0.05) | -0.12 (0.15) | -0.04 (0.13) |
| **Random part - Country** | | | | |
| Intercept | 56.06 (29.34) | **173.33 (77.00)** | 581.39 (304.97) | 230.12 (119.54) |
| Wave Slope/ Intercept Covariance | 0.42 (11.08) | 26.19 (22.37) | -141.35 (106.68) | -56.92 (46.83) |
| Wave Slope | 14.95 (8.55) | **23.96 (11.87)** | 112.66 (61.84) | 58.81 (32.93) |
| **Random part - city** | | | | |
| Intercept | **71.37 (8.64)** | **41.37 (5.40)** | **81.27 (14.73)** | **43.99 (9.18)** |
| Wave Slope/ Intercept Covariance | -0.76 (1.32) | 3.94 (2.40) | **-12.45 (5.55)** | -0.07 (0.73) |
| Slope | 0.08 (0.19) | 2.33 (1.52) | 4.40 (2.80) | 0.04 (0.14) |
| **Random part- wave** | | | | |
| Intercept | **10.79 (1.06)** | **12.079 (1.31)** | **30.37 (3.67)** | **35.228 (4.05)** |

Footnote:

**Bold** denotes statistical significance (p>0.05; Likelihood Ratio Test)

## COMPETING INTERESTS

The authors declare that they have no competing interests.

## AUTHORS' CONTRIBUTIONS

JP, RM, NKS and EAR were responsible for the design of the study. EAR was responsible for assembling and managing the data. EAR and GM conducted the analysis. All authors contributed to the interpretation of the results and writing of the manuscript. All authors have approved the final version of the manuscript.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# Multi-scalar influences on mortality change over time for 274 European cities

## SUPPLEMENTARY DATA (ONLINE ONLY)

Standardised Mortality Ratios (SMRs, 2001-referenced) calculated for 364 Urban Audit cities for which appropriate data were available, with superscript letters indicating the reason for exclusion from the analysis, where appropriate:

[a] Excluded due to distance from European mainland.
[b] Incomplete mortality and/or population data, hence no SMR was calculated.
[c] No GDP per capita data.
[d] Judged to be unreliable (see text).
[e] Excluded because no male SMR
W Western Europe
E East-Central Europe
GDR Former German Democratic Republic (East Germany)

| Country (Macroregion) | Urban Audit code | City | Male SMR Wave 1 | Male SMR Wave 2 | Male SMR Wave 3 | Female SMR Wave 1 | Female SMR Wave 2 | Female SMR Wave 3 |
|---|---|---|---|---|---|---|---|---|
| Belgium (W) | BE001C | Bruxelles / Brussel | 98.1 | 92.3 | 87.3 | 99.5 | 97.6 | 93.7 |
| | BE002C | Antwerpen | 92.4 | 88.5 | 83.7 | 93.2 | 90.2 | 90.3 |
| | BE003C | Gent | 98.3 | 91.9 | 81.4 | 91.8 | 89.1 | 87.7 |
| | BE004C | Charleroi | 118.6 | 115.4 | 111.3 | 108.1 | 100.4 | 104.3 |
| | BE005C | Liège | 110.1 | 98.5 | 97.7 | 100.6 | 97.5 | 99.8 |
| | BE006C | Brugge | 80.5 | 81.2 | 73.3 | 90.3 | 75.7 | 79.7 |
| | BE007C | Namur | -[b] | 107.4 | 91.4 | -[b] | 86.8 | 87.2 |
| Bulgaria (E) | BG001C | Sofia | 137.5 | 133.6 | 127.9 | 133.8 | 125.6 | 122.3 |
| | BG002C | Plovdiv | 140.8 | 136.2 | 127.5 | 135.6 | 119.7 | 117.1 |
| | BG003C | Varna | 140.9 | 138.8 | 126.1 | 143.3 | 123.3 | 119.8 |
| | BG004C | Burgas | 150.8 | 146.1 | 132.4 | 139.0 | 135.3 | 121.7 |
| | BG005C | Pleven | 141.4 | 139.8 | 134.0 | 136.8 | 137.7 | 114.9 |
| | BG006C | Ruse | 149.6 | 141.6 | 130.2 | 147.1 | 128.8 | 135.6 |
| | BG007C | Vidin | 153.7 | 155.1[d] | 153.9[d] | 163.0 | 173.3[d] | 145.8[d] |
| | BG008C | Stara Zagora | -[b] | -[b] | 124.8 | -[b] | -[b] | 120.6 |
| Switzerland (W) | CH001C | Zürich | 87.9[c] | 83.6[c] | 76.6[c] | 94.2[c] | 97.3[c] | 85.2[c] |
| | CH002C | Genève | 75.3[c] | 67.7[c] | 71.6[c] | 71.4[c] | 67.9[c] | 70.5[c] |
| | CH003C | Basel | 93.8[c] | 84.8[c] | 80.1[c] | 100.0[c] | 87.1[c] | 81.6[c] |
| | CH004C | Bern | 93.0[c] | 78.9[c] | 71.9[c] | 94.1[c] | 92.1[c] | 87.3[c] |
| | CH005C | Lausanne | 88.6[c] | 81.5[c] | 71.3[c] | 82.9[c] | 78.2[c] | 79.0[c] |
| | CH006C | Winterthur | 86.6[c] | 82.2[c] | 70.4[c] | 90.6[c] | 99.3[c] | 84.4[c] |
| | CH007C | St. Gallen | 82.5[c] | -[b] | 69.8[c] | 95.3[c] | -[b] | 79.9[c] |
| | CH008C | Luzern | 117.2[c] | 74.3[c] | 89.7[c] | 70.6[c] | 78.3[c] | 68.6[c] |
| | CH009C | Lugano | 77.7[c] | 59.2[c] | 61.1[c] | 82.2[c] | 70.6[c] | 58.7[c] |
| | CH010C | Biel/Bienne | 92.5[c] | -[b] | -[b] | 99.8[c] | -[b] | -[b] |
| Czech | CZ001C | Praha | 105.0 | 100.9 | 89.4 | 114.3 | 106.5 | 97.9 |

| Country (Macroregion) | Urban Audit code | City | Male SMR Wave 1 | Male SMR Wave 2 | Male SMR Wave 3 | Female SMR Wave 1 | Female SMR Wave 2 | Female SMR Wave 3 |
|---|---|---|---|---|---|---|---|---|
| Republic (E) | CZ002C | Brno | 104.8 | 98.1 | 92.4 | 109.6 | 107.4 | 93.7 |
| | CZ003C | Ostrava | 135.4 | 130.7 | 118.6 | 128.9 | 114.8 | 108.1 |
| | CZ004C | Plzen | 102.4 | 108.8 | 94.6 | 116.1 | 111.9 | 93.8 |
| | CZ005C | Usti nad Labem | 131.2 | 132.3 | 110.4 | 118.4 | 111.0 | 103.9 |
| | CZ006C | Olomouc | -[b] | 100.5 | 94.1 | -[b] | 92.4 | 90.6 |
| | CZ007C | Liberec | -[b] | 114.6 | 101.0 | -[b] | 99.0 | 96.8 |
| | CZ008C | Ceske Budejovice | -[b] | 99.7 | 94.9 | -[b] | 96.9 | 92.8 |
| | CZ009C | Hradec Kralove | -[b] | 87.8 | 78.0 | -[b] | 99.7 | 92.8 |
| | CZ010C | Pardubice | -[b] | 98.1 | 83.5 | -[b] | 93.8 | 99.2 |
| | CZ011C | Zlin | -[b] | 102.9 | 97.2 | -[b] | 95.5 | 98.0 |
| | CZ012C | Kladno | -[b] | 115.6 | 112.2 | -[b] | 117.0 | 109.8 |
| | CZ013C | Karlovy Vary | -[b] | 112.2 | 96.0 | -[b] | 102.3 | 97.9 |
| | CZ014C | Jihlava | -[b] | 103.4 | 85.7 | -[b] | 94.6 | 86.2 |
| Germany (W) | DE001C | Berlin | 93.9 | 85.2 | 77.0 | 105.4 | 98.9 | 94.8 |
| | DE002C | Hamburg | 91.1 | 85.0 | 77.4 | 96.9 | 95.3 | 93.2 |
| | DE003C | München | 86.2 | 75.8 | 70.7 | 90.5 | 82.7 | 80.3 |
| | DE004C | Köln | 92.3 | 83.3 | 79.0 | 96.5 | 93.6 | 90.7 |
| | DE005C | Frankfurt am Main | 83.8 | 81.6 | 72.3 | 91.4 | 89.1 | 87.8 |
| | DE006C | Essen | 105.8 | 94.6 | 88.7 | 104.8 | 98.2 | 99.5 |
| | DE007C | Stuttgart | 83.0 | 72.3 | 69.2 | 89.0 | 81.5 | 80.1 |
| (GDR - E) | DE008C | Leipzig | 94.1[c] | 84.3[c] | 76.4[c] | 97.3[c] | 87.5[c] | 86.3[c] |
| (GDR - E) | DE009C | Dresden | 82.1[c] | 74.5[c] | 68.1[c] | 89.7[c] | 85.6[c] | 81.7[c] |
| | DE010C | Dortmund | 102.1 | 93.6 | 88.9 | 102.1 | 96.1 | 94.5 |
| | DE011C | Düsseldorf | 97.4 | 91.9 | 81.4 | 101.9 | 99.5 | 95.3 |
| | DE012C | Bremen | 94.6 | 88.1 | 80.9 | 93.2 | 92.7 | 88.4 |
| | DE013C | Hannover | 93.3 | 86.0 | 79.9 | 95.8 | 90.9 | 91.7 |
| | DE014C | Nürnberg | 93.4 | 82.8 | 78.0 | 99.3 | 89.2 | 92.7 |
| | DE015C | Bochum | 101.6 | 85.7 | 85.9 | 102.4 | 94.3 | 97.1 |
| | DE017C | Bielefeld | 86.8 | 79.7 | 79.4 | 88.8 | 91.1 | 86.9 |
| (GDR - E) | DE018C | Halle an der Saale | 103.0 | 91.8 | 87.8 | 98.2 | 93.3 | 94.8 |
| (GDR - E) | DE019C | Magdeburg | 100.4 | 86.8 | 84.3 | 102.4 | 100.5 | 87.6 |
| | DE020C | Wiesbaden | 85.3 | 79.6 | 72.7 | 103.9 | 91.3 | 93.5 |
| | DE021C | Göttingen | 84.1 | 84.8 | 66.6 | 102.7 | 96.9 | 95.8 |
| | DE022C | Mülheim a.d.Ruhr | 94.2 | 81.3 | 83.0 | 105.3 | 95.7 | 97.4 |
| | DE023C | Moers | 88.2 | 83.3 | 74.2 | 103.4 | 86.8 | 79.6 |
| | DE025C | Darmstadt | 85.4 | 79.1 | 75.7 | 92.7 | 91.2 | 95.7 |
| | DE026C | Trier | 92.0 | 90.8 | 83.0 | 86.2 | 95.8 | 86.3 |
| | DE027C | Freiburg im Breisgau | 82.1 | 74.1 | 66.8 | 91.7 | 90.6 | 89.6 |
| | DE028C | Regensburg | 92.9 | 85.5 | 76.2 | 92.6 | 87.9 | 88.2 |
| (GDR - E) | DE029C | Frankfurt (Oder) | 105.2[c] | 93.7[c] | 80.5[c] | 98.9[c] | 91.7[c] | 87.0[c] |
| (GDR - E) | DE030C | Weimar | 88.6 | 80.9 | 77.5 | 95.6 | 92.9 | 91.9 |
| (GDR - E) | DE031C | Schwerin | 101.7 | 86.3 | 81.4 | 96.3 | 86.6 | 83.1 |
| (GDR - E) | DE032C | Erfurt | 92.8 | 86.2 | 81.2 | 98.8 | 93.8 | 90.4 |
| | DE033C | Augsburg | 99.3 | 90.2 | 80.7 | 98.0 | 93.7 | 91.3 |
| | DE034C | Bonn | 81.7 | 75.6 | 68.0 | 92.0 | 85.2 | 87.8 |
| | DE035C | Karlsruhe | 87.3 | 79.6 | 70.0 | 97.3 | 85.4 | 83.4 |
| | DE036C | Mönchengladbach | 99.8 | 94.9 | 87.4 | 104.4 | 94.8 | 100.4 |
| | DE037C | Mainz | 88.9 | 78.1 | 73.0 | 97.5 | 93.3 | 91.0 |
| | DE039C | Kiel | 105.5 | 91.5 | 85.0 | 97.4 | 99.7 | 97.3 |
| | DE040C | Saarbrucken | 113.2 | 95.4 | 103.3 | 104.8 | 96.5 | 104.7 |
| (GDR - E) | DE041C | Potsdam | 83.1[c] | 81.5[c] | 69.8[c] | 90.3[c] | 79.3[c] | 82.3[c] |
| | DE042C | Koblenz | 94.0 | 88.5 | 83.5 | 100.9 | 90.9 | 95.5 |
| (GDR - E) | DE043C | Rostock | -[b] | 75.8[c] | 77.6[c] | -[b] | 84.4[c] | 77.5[c] |
| Denmark (W) | DK001C | København | 124.5[d] | 122.4[d] | -[b] | 133.1[d] | 127.6[d] | -[b] |
| | DK002C | Aarhus | 98.2 | 88.4 | -[b] | 110.2 | 101.1 | -[b] |
| | DK003C | Odense | 105.3 | 101.0 | -[b] | 111.8 | 109.0 | -[b] |
| | DK004C | Aalborg | 101.4 | 100.2 | -[b] | 116.0 | 105.6 | -[b] |

| | | | Male SMR | | | Female SMR | | |
|---|---|---|---|---|---|---|---|---|
| Country (Macroregion) | Urban Audit code | City | Wave 1 | Wave 2 | Wave 3 | Wave 1 | Wave 2 | Wave 3 |
| Estonia | EE001C | Tallinn | 171.4 | 156.6 | 124.7 | 128.8 | 115.0 | 96.1 |
| (E) | EE002C | Tartu | 168.2 | 136.9 | 122.0 | 120.6 | 109.0 | 96.2 |
| Greece | EL001C | Athina | 99.9 | 97.7 | -[b] | 107.9 | 104.9 | -[b] |
| (W) | EL002C | Thessaloniki | 101.0 | 102.7 | -[b] | 111.6 | 107.5 | -[b] |
| | EL003C | Patra | 90.4 | 88.6 | -[b] | 99.8 | 107.2 | -[b] |
| | EL004C | Irakleio | 92.0 | -[b] | -[b] | 88.7 | 93.3[e] | -[b] |
| | EL005C | Larisa | 88.6 | 88.0 | -[b] | 98.1 | 99.7 | -[b] |
| | EL006C | Volos | 96.4 | 94.8 | -[b] | 105.5 | 111.8 | -[b] |
| | EL007C | Ioannina | 82.3 | 73.0 | -[b] | 86.5 | 87.5 | -[b] |
| | EL008C | Kavala | 104.8 | 100.0 | -[b] | 110.0 | 113.6 | -[b] |
| | EL009C | Kalamata | 107.7 | 96.5 | -[b] | 107.9 | 102.1 | -[b] |
| Spain | ES001C | Madrid | 90.5[d] | 76.4 | 71.5 | 72.5[d] | 69.8 | 66.9 |
| (W) | ES002C | Barcelona | 94.2[d] | 80.0 | 74.3 | 81.0[d] | 72.3 | 72.5 |
| | ES003C | Valencia | 136.5[d] | 89.6 | 81.0 | 106.4[d] | 80.8 | 78.2 |
| | ES004C | Sevilla | 149.6[d] | 90.4 | 84.2 | 120.6[d] | 82.8 | 79.1 |
| | ES005C | Zaragoza | 108.0[d] | -[b] | 77.6 | 96.7[d] | 82.8[e] | 75.2 |
| | ES006C | Málaga | 123.7[d] | 92.0 | 87.9 | 105.8[d] | 86.7 | 87.4 |
| | ES007C | Murcia | 120.3[d] | 82.0 | 75.2 | 102.4[d] | 79.1 | 81.2 |
| | ES008C | Las Palmas | 157.5[a] | 98.7[a] | 88.5[a] | 139.9[a] | 89.5[a] | 87.9[a] |
| | ES009C | Valladolid | -[b] | -[b] | 73.7 | -[b] | 71.9 | 70.0 |
| | ES010C | Palma de Mallorca | 138.0[d] | 82.2 | 81.3 | 122.4[d] | 79.3 | 79.3 |
| | ES011C | Santiago de Compostela | -[b] | 82.2 | 76.0 | -[b] | 69.5 | 65.7 |
| | ES012C | Vitoria/Gasteiz | -[b] | 73.3 | 68.0 | -[b] | 72.5 | 68.1 |
| | ES013C | Oviedo | -[b] | 91.4 | 78.7 | -[b] | 80.2 | 74.8 |
| | ES014C | Pamplona/Iruña | 149.6[d] | 74.6 | 72.1 | 109.7[d] | 69.4 | 68.2 |
| | ES015C | Santander | 135.6[d] | 86.4 | 80.2 | 101.3[d] | 72.6 | 75.6 |
| | ES016C | Toledo | 274.3[d] | 79.4 | 72.4 | 206.3[d] | 75.6 | 68.0 |
| | ES017C | Badajoz | 190.7[d] | 81.6 | 78.7 | 141.1[d] | 76.6 | 85.0 |
| | ES018C | Logroño | 116.2[d] | 73.8 | 72.0 | 100.5[d] | 74.9 | 69.3 |
| | ES019C | Bilbao | -[b] | 81.8 | 76.5 | -[b] | 74.9 | 70.1 |
| | ES020C | Córdoba | -[b] | 86.2 | 84.7 | -[b] | 79.2 | 77.0 |
| | ES021C | Alicante/Alacant | -[b] | 80.6 | 78.1 | -[b] | 71.5 | 69.8 |
| | ES022C | Vigo | -[b] | 80.4 | 76.4 | -[b] | 74.1 | 72.0 |
| | ES023C | Gijón | -[b] | 88.6 | 81.9 | -[b] | 79.5 | 82.2 |
| | ES024C | Hospitalet de Llobregat(L') | -[b] | 72.6 | 73.1 | -[b] | 69.4 | 69.4 |
| | ES025C | Sta. Cruz de Tenerife | -[a] | 90.5[a] | 81.3[a] | -[a] | 87.7[a] | 77.6[a] |
| | ES026C | Coruña, A | -[b] | -[b] | 73.4[c] | -[b] | -[b] | 70.1[c] |
| Finland | FI001C | Helsinki | 103.8 | -[b] | -[b] | 101.8 | -[b] | -[b] |
| (W) | FI002C | Tampere | 90.1 | -[b] | 80.0 | 103.7 | -[b] | 82.6 |
| | FI003C | Turku | 98.7 | -[b] | 89.8 | 98.0 | -[b] | 88.2 |
| | FI004C | Oulu | 89.2 | -[b] | 84.6 | 86.1 | -[b] | 74.3 |
| France | FR001C | Paris | 76.4[d] | 67.4[d] | -[b] | 75.2[d] | 66.8[d] | -[b] |
| (W) | FR003C | Lyon | 80.2 | 78.8 | -[b] | 76.1 | 73.5 | -[b] |
| | FR004C | Toulouse | 73.0 | 70.1 | -[b] | 71.8 | 63.3 | -[b] |
| | FR006C | Strasbourg | 86.8 | 76.4 | -[b] | 85.1 | 72.8 | -[b] |
| | FR007C | Bordeaux | 86.4 | 72.1 | -[b] | 78.9 | 66.6 | -[b] |
| | FR008C | Nantes | 85.7 | 74.6 | -[b] | 70.9 | 63.3 | -[b] |
| | FR009C | Lille | 106.7 | 91.7 | -[b] | 95.8 | 77.7 | -[b] |
| | FR010C | Montpellier | 79.6 | 68.1 | -[b] | 73.1 | 67.4 | -[b] |
| | FR011C | Saint-Etienne | 86.7 | 80.0 | -[b] | 82.0 | 68.9 | -[b] |
| | FR012C | Le Havre | 102.3 | 92.9 | -[b] | 84.3 | 71.3 | -[b] |
| | FR013C | Rennes | 79.5 | 67.9 | -[b] | 73.1 | 62.6 | -[b] |
| | FR014C | Amiens | 101.9 | 83.3 | -[b] | 81.0 | 74.9 | -[b] |
| | FR015C | Rouen | 92.5 | 80.2 | -[b] | 76.6 | 71.3 | -[b] |
| | FR016C | Nancy | 88.8 | 76.4 | -[b] | 80.8 | 67.6 | -[b] |
| | FR017C | Metz | 91.9 | 83.4 | -[b] | 90.8 | 79.2 | -[b] |
| | FR018C | Reims | 98.4 | 86.9 | -[b] | 84.9 | 78.2 | -[b] |
| | FR019C | Orléans | 77.8 | 67.8 | -[b] | 71.2 | 62.3 | -[b] |

| Country (Macroregion) | Urban Audit code | City | Male SMR Wave 1 | Male SMR Wave 2 | Male SMR Wave 3 | Female SMR Wave 1 | Female SMR Wave 2 | Female SMR Wave 3 |
|---|---|---|---|---|---|---|---|---|
| | FR020C | Dijon | 87.5 | 68.0 | -[b] | 76.1 | 59.6 | -[b] |
| | FR021C | Poitiers | 82.9 | 69.8 | -[b] | 81.4 | 59.9 | -[b] |
| | FR022C | Clermont-Ferrand | 89.1 | 78.6 | -[b] | 75.6 | 63.8 | -[b] |
| | FR023C | Caen | 86.0 | 83.3 | -[b] | 71.0 | 64.8 | -[b] |
| | FR024C | Limoges | 87.5 | 73.0 | -[b] | 76.8 | 65.3 | -[b] |
| | FR025C | Besançon | 83.5 | 69.5 | -[b] | 73.7 | 67.5 | -[b] |
| | FR026C | Grenoble | 73.4 | 65.1 | -[b] | 75.7 | 60.6 | -[b] |
| | FR027C | Ajaccio | 88.3 | 71.4 | -[b] | 85.8 | 70.7 | -[b] |
| | FR028C | Saint Denis | 108.1[a] | 98.9[a] | -[a] | 94.1[a] | 87.1[a] | -[a] |
| | FR029C | Pointe-à-Pitre | 97.6[a] | 86.7[a] | -[a] | 78.3[a] | 76.2[a] | -[a] |
| | FR030C | Fort-de-France | 84.9[a] | 79.7[a] | -[a] | 78.8[a] | 70.2[a] | -[a] |
| | FR031C | Cayenne | 112.1[a] | 90.8[a] | -[a] | 108.8[a] | 92.4[a] | -[a] |
| | FR032C | Toulon | 91.0 | 76.9 | -[b] | 82.4 | 71.2 | -[b] |
| | FR035C | Tours | 77.6 | 69.6 | -[b] | 72.9 | 58.9 | -[b] |
| | FR202C | Aix-en-Provence | 88.9 | 65.2 | -[b] | 89.8 | 68.2 | -[b] |
| | FR203C | Marseille | 85.9 | 68.5 | -[b] | 83.5 | 60.1 | -[b] |
| | FR205C | Nice | 74.2 | 75.9 | -[b] | 69.6 | 73.0 | -[b] |
| | FR207C | Lens - Liévin | 127.4 | 117.8 | -[b] | 86.3 | 80.5 | -[b] |
| Croatia | HR001C | Zagreb | 119.5 | -[b] | -[b] | 114.8 | -[b] | -[b] |
| (E) | HR002C | Rijeka | 124.1 | -[b] | -[b] | 108.1 | -[b] | -[b] |
| | HR003C | Slavonski Brod | 131.8 | -[b] | -[b] | 125.1 | -[b] | -[b] |
| | HR004C | Osijek | 136.8 | -[b] | -[b] | 118.2 | -[b] | -[b] |
| | HR005C | Split | 113.1 | -[b] | -[b] | 103.4 | -[b] | -[b] |
| Hungary | HU001C | Budapest | 125.3 | 121.1 | 118.7 | 122.2 | 116.7 | 108.9 |
| (E) | HU002C | Miskolc | 152.3 | 148.6 | 135.2 | 135.6 | 121.1 | 120.5 |
| | HU003C | Nyiregyhaza | 151.7 | 134.2 | 134.0 | 129.8 | 102.3 | 111.3 |
| | HU004C | Pecs | 138.3 | 124.0 | 130.6 | 126.5 | 104.1 | 119.4 |
| | HU005C | Debrecen | 151.2 | 142.8 | 142.1 | 135.9 | 110.9 | 125.0 |
| | HU006C | Szeged | 138.5 | 146.7 | 116.9 | 128.7 | 110.5 | 108.2 |
| | HU007C | Gyor | 131.3 | 136.6 | 124.8 | 116.3 | 127.1 | 111.5 |
| | HU008C | Kecskemét | 145.4 | 143.8 | 137.5 | 126.1 | 133.4 | 122.1 |
| | HU009C | Székesfehérvár | 121.5 | 116.8 | 112.7 | 116.9 | 114.7 | 102.8 |
| Ireland | IE001C | Dublin | 118.3 | 103.2 | -[b] | 120.6 | 108.3 | -[b] |
| (W) | IE002C | Cork | 111.4 | 106.4 | -[b] | 124.1 | 119.4 | -[b] |
| | IE003C | Limerick | 127.5[d] | 92.2 | -[b] | 138.3[d] | 94.1 | -[b] |
| | IE004C | Galway | 93.9 | 74.8 | -[b] | 101.2 | 99.7 | -[b] |
| | IE005C | Waterford | 93.2 | 95.0 | -[b] | 96.9 | 96.6 | -[b] |
| Italy | IT001C | Roma | 82.7[c] | 83.5[c] | 69.6[c] | 84.4[c] | 87.2[c] | 76.2[c] |
| (W) | IT002C | Milano | 82.6[c] | 75.6[c] | 71.4[c] | 82.6[c] | 75.0[c] | 75.9[c] |
| | IT003C | Napoli | 101.6[c] | 90.6[c] | 86.9[c] | 100.8[c] | 93.1[c] | 90.6[c] |
| | IT004C | Torino | 82.3[c] | 76.8[c] | 72.4[c] | 83.8[c] | 75.1[c] | 74.1[c] |
| | IT005C | Palermo | 96.2[c] | 86.9[c] | 85.9[c] | 100.8[c] | 88.6[c] | 87.5[c] |
| | IT006C | Genova | 89.3[c] | 80.3[c] | 78.7[c] | 89.0[c] | 80.4[c] | 84.1[c] |
| | IT007C | Firenze | 82.6[c] | 74.2[c] | 70.0[c] | 83.4[c] | 74.5[c] | 79.2[c] |
| | IT008C | Bari | 86.9[c] | 60.3[c] | 68.4[c] | 91.9[c] | 60.9[c] | 75.7[c] |
| | IT009C | Bologna | 82.9[c] | 74.4[c] | 72.4[c] | 82.1[c] | 75.5[c] | 78.6[c] |
| | IT010C | Catania | 94.9[c] | 86.6[c] | 87.8[c] | 97.9[c] | 88.8[c] | 88.4[c] |
| | IT011C | Venezia | 85.1[c] | 80.6[c] | 75.0[c] | 84.6[c] | 80.9[c] | 83.0[c] |
| | IT012C | Verona | 76.5[c] | 71.8[c] | 67.3[c] | 80.3[c] | 68.6[c] | 68.2[c] |
| | IT013C | Cremona | 88.6[c] | 82.9[c] | 75.4[c] | 77.5[c] | 66.7[c] | 72.8[c] |
| | IT014C | Trento | 72.1 | 73.8 | 71.1 | 72.0 | 69.4 | 71.0 |
| | IT015C | Trieste | 93.8[c] | 86.1[c] | 87.4[c] | 99.0[c] | 93.0[c] | 90.9[c] |
| | IT016C | Perugia | 72.4[c] | 71.4[c] | 73.9[c] | 81.0[c] | 72.5[c] | 79.1[c] |
| | IT017C | Ancona | 77.5[c] | 73.3[c] | 67.4[c] | 77.2[c] | 72.2[c] | 74.4[c] |
| | IT018C | L'Aquila | 87.9[c] | 79.6[c] | 75.2[c] | 81.8[c] | 71.3[c] | 72.9[c] |
| | IT019C | Pescara | 82.6[c] | 77.3[c] | 66.0[c] | 79.4[c] | 71.6[c] | 66.7[c] |
| | IT020C | Campobasso | 73.6[c] | 75.6[c] | 79.9[c] | 79.4[c] | 71.8[c] | 67.9[c] |
| | IT021C | Caserta | 82.3[c] | 82.7[c] | 77.4[c] | 85.2[c] | 74.2[c] | 81.8[c] |

| Country (Macroregion) | Urban Audit code | City | Male SMR | | | Female SMR | | |
|---|---|---|---|---|---|---|---|---|
| | | | Wave 1 | Wave 2 | Wave 3 | Wave 1 | Wave 2 | Wave 3 |
| | IT022C | Taranto | 88.7[c] | 68.9[c] | 89.2[c] | 86.5[c] | 70.1[c] | 83.7[c] |
| | IT023C | Potenza | 82.3[c] | 73.1[c] | 73.4[c] | 76.8[c] | 70.7[c] | 72.7[c] |
| | IT024C | Catanzaro | 77.1[c] | 73.6[c] | 76.7[c] | 86.7[c] | 76.8[c] | 73.6[c] |
| | IT025C | Reggio di Calabria | 91.8[c] | 81.9[c] | 78.4[c] | 87.2[c] | 83.8[c] | 82.7[c] |
| | IT026C | Sassari | 88.4[c] | 75.5[c] | 72.6[c] | 86.7[c] | 74.6[c] | 73.7[c] |
| | IT027C | Cagliari | 85.7[c] | 77.8[c] | 74.9[c] | 75.9[c] | 74.4[c] | 73.2[c] |
| | IT028C | Padova | -[b] | 74.3[c] | 72.9[c] | -[b] | 79.0[c] | 83.1[c] |
| | IT029C | Brescia | -[b] | 70.7[c] | 68.2[c] | -[b] | 67.1[c] | 68.7[c] |
| | IT030C | Modena | -[b] | 72.8[c] | 69.9[c] | -[b] | 74.8[c] | 77.6[c] |
| | IT031C | Foggia | -[b] | 74.0[c] | 70.0[c] | -[b] | 73.4[c] | 72.3[c] |
| | IT032C | Salerno | -[b] | 96.9[c] | 93.7[c] | -[b] | 80.6[c] | 84.5[c] |
| Lithuania | LT001C | Vilnius | 155.8 | 142.8 | 145.8 | 115.2 | 105.4 | 112.2 |
| (E) | LT002C | Kaunas | 153.0 | 145.0 | 146.5 | 117.8 | 108.5 | 108.8 |
| | LT003C | Panevezys | 151.1 | 133.2 | 137.0 | 113.7 | 109.3 | 102.2 |
| Luxembourg (W) | LU001C | Luxembourg (city) | 93.6 | 90.8 | 69.0 | 99.8 | 83.8 | 81.0 |
| Latvia | LV001C | Riga | 173.1 | 154.0 | 143.5 | 130.2 | 118.9 | 110.6 |
| (E) | LV002C | Liepaja | 202.2 | -[b] | 140.7 | 145.0 | -[b] | 105.4 |
| Malta | MT001C | Valletta | -[b] | 73.9 | 85.0 | -[b] | 86.5 | 87.9 |
| (W) | MT002C | Gozo | -[b] | 73.3 | 65.5 | -[b] | 95.1 | 77.6 |
| Netherlands | NL001C | 's-Gravenhage | 104.4 | 98.8 | -[b] | 109.7 | 104.1 | -[b] |
| (W) | NL002C | Amsterdam | 102.7 | 89.1 | -[b] | 113.9 | 106.2 | -[b] |
| | NL003C | Rotterdam | 107.8[c] | 99.2[c] | -[b] | 109.8[c] | 106.6[c] | -[b] |
| | NL004C | Utrecht | 102.9 | 95.6 | -[b] | 105.1 | 100.3 | -[b] |
| | NL005C | Eindhoven | 91.9 | 88.7 | -[b] | 106.5 | 101.5 | -[b] |
| | NL006C | Tilburg | 103.1 | 97.8 | -[b] | 119.9 | 105.9 | -[b] |
| | NL007C | Groningen | 106.2 | 92.2 | -[b] | 111.1 | 107.8 | -[b] |
| | NL008C | Enschede | 107.4 | 99.1 | -[b] | 114.4 | 110.5 | -[b] |
| | NL009C | Arnhem | 108.0 | 100.8 | -[b] | 114.0 | 117.1 | -[b] |
| | NL010C | Heerlen | 108.5 | 96.0 | -[b] | 112.8 | 104.9 | -[b] |
| | NL011C | Almere | -[b] | 77.8 | -[b] | -[b] | 88.5 | -[b] |
| | NL012C | Breda | -[b] | 85.8 | -[b] | -[b] | 96.9 | -[b] |
| | NL013C | Nijmegen | -[b] | 93.0 | -[b] | -[b] | 100.7 | -[b] |
| | NL014C | Apeldoorn | -[b] | 84.0 | -[b] | -[b] | 96.9 | -[b] |
| | NL015C | Leeuwarden | -[b] | 86.2 | -[b] | -[b] | 101.7 | -[b] |
| Norway | NO001C | Oslo | 97.2[c] | 91.7[c] | 84.2[c] | 109.1[c] | 101.2[c] | 99.3[c] |
| (W) | NO002C | Bergen | 87.3[c] | 79.0[c] | 79.1[c] | 94.5[c] | 91.7[c] | 89.1[c] |
| | NO003C | Trondheim | 83.9[c] | 86.0[c] | 74.2[c] | 92.8[c] | 86.3[c] | 92.4[c] |
| | NO004C | Stavanger | 85.2[c] | 85.4[c] | 74.4[c] | 94.1[c] | 94.2[c] | 92.5[c] |
| | NO005C | Kristiansand | 89.9[c] | 80.3[c] | 79.8[c] | 91.1[c] | 101.2[c] | 90.7[c] |
| | NO006C | Tromsø | 84.5[c] | 77.2[c] | 72.8[c] | 107.6[c] | 91.6[c] | 81.5[c] |
| Poland | PL001C | Warszawa | 108.5 | 102.9 | 95.0 | 103.9 | 96.9 | 88.7 |
| (E) | PL002C | Lodz | 158.1 | 142.7 | 141.0 | 124.5 | 114.0 | 113.6 |
| | PL003C | Krakow | 110.9 | 101.9 | 97.9 | 108.1 | 96.7 | 91.1 |
| | PL004C | Wroclaw | 114.2 | 109.2 | 106.0 | 95.9 | 93.4 | 91.7 |
| | PL005C | Poznan | 123.1 | 112.8 | 106.8 | 115.5 | 105.0 | 99.7 |
| | PL006C | Gdansk | 120.3 | 115.2 | 104.4 | 94.1 | 98.7 | 93.9 |
| | PL007C | Szczecin | 124.4 | 123.5 | 115.6 | 107.3 | 98.3 | 93.5 |
| | PL008C | Bydgoszcz | 120.3 | 113.5 | 111.3 | 108.7 | 106.5 | 98.8 |
| | PL009C | Lublin | 128.1 | 116.0 | 112.8 | 107.2 | 98.9 | 95.5 |
| | PL010C | Katowice | 138.0 | 134.6 | 118.5 | 120.6 | 115.7 | 109.3 |
| | PL011C | Bialystok | 119.2 | 110.5 | 102.1 | 94.9 | 95.6 | 80.4 |
| | PL012C | Kielce | 109.9 | 110.2 | 101.5 | 97.7 | 103.2 | 83.2 |
| | PL013C | Torun | 120.7 | 114.2 | 108.4 | 103.8 | 94.8 | 90.1 |
| | PL014C | Olsztyn | 114.3 | 95.5 | 93.2 | 93.5 | 83.0 | 83.8 |
| | PL015C | Rzeszow | 104.2 | 98.7 | 90.3 | 100.2 | 94.8 | 82.6 |
| | PL016C | Opole | 102.1[d] | 104.0 | 94.5 | 102.6[d] | 100.2 | 90.2 |
| | PL017C | Gorzow Wielkopolski | 118.3 | 120.7 | 112.7 | 107.3 | 89.6 | 91.6 |

| Country (Macroregion) | Urban Audit code | City | Male SMR | | | Female SMR | | |
|---|---|---|---|---|---|---|---|---|
| | | | Wave 1 | Wave 2 | Wave 3 | Wave 1 | Wave 2 | Wave 3 |
| | PL018C | Zielona Gora | 122.2[d] | 105.7 | 107.8 | 93.4[d] | 89.2 | 89.9 |
| | PL019C | Jelenia Gora | 130.4 | 126.7 | 110.9 | 115.0 | 103.2 | 101.5 |
| | PL020C | Nowy Sacz | 115.9 | 112.3 | 107.3 | 94.6 | 94.4 | 95.9 |
| | PL021C | Suwalki | 139.4 | 114.2 | 95.4 | 104.8 | 100.5 | 84.6 |
| | PL022C | Konin | 125.1[d] | 112.9 | 99.5 | 86.3[d] | 90.6 | 87.6 |
| | PL023C | Zory | 109.3 | 128.3 | 110.1 | 123.9 | 107.1 | 94.6 |
| | PL024C | Czestochowa | 140.0 | 125.5 | 120.7 | 117.7 | 113.4 | 107.2 |
| | PL025C | Radom | 137.1 | 129.2 | 117.2 | 104.7 | 97.6 | 93.3 |
| | PL026C | Plock | 120.7 | 123.8 | 124.2 | 108.4 | 100.1 | 106.1 |
| | PL027C | Kalisz | 147.2 | 127.3 | 113.9 | 125.4 | 96.3 | 101.6 |
| | PL028C | Koszalin | 106.6 | 104.4 | 101.4 | 102.1 | 95.1 | 90.8 |
| Portugal | PT001C | Lisboa | 113.6 | 105.4 | 104.1 | 102.2 | 93.0 | 92.2 |
| (W) | PT002C | Porto | 107.7 | 102.0 | 110.2[d] | 102.1 | 94.7 | 94.7[d] |
| | PT003C | Braga | 88.2 | 75.9 | 73.2 | 95.2 | 78.7 | 74.6 |
| | PT004C | Funchal | 134.3[a] | 151.2[a] | 144.2[a] | 115.5[a] | 126.6[a] | 129.7[a] |
| | PT005C | Coimbra | 87.8 | 91.6 | 88.0 | 92.0 | 80.3 | 82.1 |
| | PT006C | Setúbal | 116.1 | 96.9 | 95.2 | 103.1 | 102.6 | 89.4 |
| | PT007C | Ponta Delgada | 133.2[a] | 160.1[a] | 130.4[a] | 127.4[a] | 125.3[a] | 120.9[a] |
| | PT008C | Aveiro | 90.0 | 81.6 | 83.5 | 92.6 | 90.4 | 85.5 |
| | PT009C | Faro | -[b] | 104.3 | 107.2[d] | -[b] | 99.3 | 110.0[d] |
| Romania | RO001C | Bucuresti | 136.4 | 121.6 | 118.2 | 133.0 | 118.0 | 112.9 |
| (E) | RO002C | Cluj-Napoca | 142.5 | 119.4 | 111.8 | 133.8 | 122.4 | 104.3 |
| | RO003C | Timisoara | 143.6 | 129.3 | 113.7 | 134.3 | 132.7 | 111.0 |
| | RO004C | Craiova | 141.7 | 123.1 | 120.0 | 148.9 | 125.8 | 116.5 |
| | RO005C | Braila | 158.2 | 144.7 | 134.7 | 131.5 | 138.6 | 117.3 |
| | RO006C | Oradea | 168.2 | 143.5 | 131.1 | 157.1 | 140.9 | 128.8 |
| | RO007C | Bacau | 158.2 | 135.3 | 130.6 | 141.4 | 123.2 | 107.5 |
| | RO008C | Arad | 156.6 | 160.1[d] | 130.7 | 148.1 | 164.0[d] | 134.5 |
| | RO009C | Sibiu | 153.5 | 127.7 | 120.6 | 136.3 | 123.0 | 111.2 |
| | RO010C | Targu Mures | 141.8 | 127.0 | 113.3 | 136.4 | 119.9 | 109.7 |
| | RO011C | Piatra Neamt | 149.7 | 138.2 | 116.2 | 143.1 | 118.1 | 112.4 |
| | RO012C | Calarasi | 177.2 | 163.8 | 170.0[d] | 161.3 | 136.3 | 120.1[d] |
| | RO013C | Giurgiu | 156.5 | 140.1 | 142.5[d] | 161.3 | 141.7 | 130.6[d] |
| | RO014C | Alba Iulia | 134.5 | 123.6 | 107.7 | 117.4 | 112.6 | 111.0 |
| Sweden | SE001C | Stockholm | 86.1 | 84.2 | 79.7 | 97.7 | 94.9 | 96.8 |
| (W) | SE002C | Göteborg | 89.8 | 83.9 | 81.1 | 99.6 | 95.9 | 96.9 |
| | SE003C | Malmö | 91.9 | 85.8 | 87.8 | 97.7 | 99.1 | 99.6 |
| | SE004C | Jönköping | 83.2 | 79.5 | 73.7 | 92.6 | 96.7 | 85.3 |
| | SE005C | Umeå | 121.5[d] | 68.9 | 61.6 | 85.2[d] | 88.9 | 83.3 |
| | SE006C | Uppsala | 76.0 | 70.2 | 66.3 | 92.2 | 84.6 | 82.8 |
| | SE007C | Linköping | 82.3 | 80.1 | 71.6 | 83.9 | 92.9 | 92.5 |
| | SE008C | Örebro | 84.8 | 86.6 | 73.5 | 95.9 | 90.2 | 94.8 |
| Slovenia | SI001C | Ljubljana | 94.1 | 92.4 | 70.7 | 86.5 | 82.2 | 70.2 |
| (E) | SI002C | Maribor | 110.9 | 108.1 | 90.6 | 95.1 | 92.4 | 91.8 |
| Slovakia | SK001C | Bratislava | 79.4 | 111.2 | 106.9 | 83.1 | 107.3 | 105.5 |
| (E) | SK002C | Kosice | 102.3 | 124.4 | 116.5 | 102.3 | 120.4 | 112.6 |
| | SK003C | Banska Bystrica | 86.5 | 111.2 | 102.3 | 93.6 | 108.4 | 101.9 |
| | SK004C | Nitra | 101.9 | 108.4 | 105.6 | 97.3 | 105.8 | 107.9 |
| | SK005C | PreSov | 110.3 | 112.8 | 105.5 | 108.4 | 108.5 | 99.6 |
| | SK006C | Zilina | 106.4 | 104.7 | 111.4 | 101.3 | 109.8 | 109.3 |
| | SK007C | Trnava | 108.6 | 121.9 | 101.1 | 94.3 | 131.2 | 103.4 |
| | SK008C | Trencín | 96.0 | 103.3 | 87.4 | 85.7 | 94.2 | 90.0 |
| Turkey | TR001C | Ankara | 111.2[c] | 106.8[c] | -[b] | 151.8[c] | 148.3[c] | -[b] |
| (W) | TR002C | Adana | 115.6[c] | 100.5[c] | -[b] | 167.6[c] | 148.3[c] | -[b] |
| | TR003C | Antalya | 51.2[c] | 45.8[c] | -[b] | 76.3[c] | 70.6[c] | -[b] |
| | TR004C | Balikesir | 61.0[c] | 46.2[c] | -[b] | 85.1[c] | 64.6[c] | -[b] |
| | TR005C | Bursa | 98.3[c] | 75.5[c] | -[b] | 136.8[c] | 106.9[c] | -[b] |
| | TR006C | Denizli | 49.9[c] | 41.1[c] | -[b] | 71.9[c] | 55.7[c] | -[b] |

| Country (Macroregion) | Urban Audit code | City | Male SMR Wave 1 | Male SMR Wave 2 | Male SMR Wave 3 | Female SMR Wave 1 | Female SMR Wave 2 | Female SMR Wave 3 |
|---|---|---|---|---|---|---|---|---|
| | TR007C | Diyarbakir | 59.9[c] | 50.5[c] | -[b] | 90.6[c] | 78.6[c] | -[b] |
| | TR008C | Edirne | 75.6[c] | 62.0[c] | -[b] | 92.1[c] | 76.7[c] | -[b] |
| | TR009C | Erzurum | 63.0[c] | 55.4[c] | -[b] | 92.9[c] | 86.6[c] | -[b] |
| | TR010C | Gaziantep | 119.1[c] | 101.6[c] | -[b] | 167.8[c] | 144.6[c] | -[b] |
| | TR011C | Hatay | 26.4[c] | 29.8[c] | -[b] | 37.8[c] | 45.7[c] | -[b] |
| | TR012C | Istanbul | 96.8[c] | 96.2[c] | -[b] | 126.5[c] | 127.6[c] | -[b] |
| | TR013C | Izmir | 104.6[c] | 98.8[c] | -[b] | 139.7[c] | 133.4[c] | -[b] |
| | TR014C | Kars | 23.7[c] | 18.1[c] | -[b] | 38.1[c] | 28.8[c] | -[b] |
| | TR015C | Kastamonu | 52.2[c] | 31.2[c] | -[b] | 70.6[c] | 44.8[c] | -[b] |
| | TR016C | Kayseri | 77.5[c] | 67.0[c] | -[b] | 113.4[c] | 99.8[c] | -[b] |
| | TR017C | Kocaeli | 58.2[c] | 63.2[c] | -[b] | 79.2[c] | 90.3[c] | -[b] |
| | TR018C | Konya | 65.9[c] | 54.9[c] | -[b] | 96.5[c] | 82.6[c] | -[b] |
| | TR019C | Malatya | 64.1[c] | 54.9[c] | -[b] | 97.1[c] | 82.4[c] | -[b] |
| | TR020C | Manisa | 53.3[c] | 44.9[c] | -[b] | 73.2[c] | 62.3[c] | -[b] |
| | TR021C | Nevsehir | 35.8[c] | 27.0[c] | -[b] | 51.7[c] | 39.3[c] | -[b] |
| | TR022C | Samsun | 74.9[c] | 55.4[c] | -[b] | 108.3[c] | 82.4[c] | -[b] |
| | TR023C | Siirt | 34.1[c] | 13.8[c] | -[b] | 42.8[c] | 18.7[c] | -[b] |
| | TR024C | Trabzon | 48.2[c] | 38.4[c] | -[b] | 63.4[c] | 50.1[c] | -[b] |
| | TR025C | Van | 53.4[c] | 35.4[c] | -[b] | 82.9[c] | 57.9[c] | -[b] |
| | TR026C | Zonguldak | 21.9[c] | 36.4[c] | -[b] | 32.3[c] | 52.9[c] | -[b] |
| United Kingdom (W) | UK001C | London | 91.3 | 82.7 | 77.9[d] | 101.2 | 95.8 | 159.9[d] |
| | UK002C | Birmingham | 103.6 | 95.3 | 88.8 | 106.3 | 102.6 | 99.3 |
| | UK003C | Leeds | 92.7 | 84.4 | 83.4 | 103.4 | 98.4 | 96.2 |
| | UK004C | Glasgow | 141.4 | 136.5 | 126.5 | 132.5 | 128.9 | 128.0 |
| | UK005C | Bradford | 101.7 | 96.6 | 89.4 | 114.2 | 110.9 | 108.2 |
| | UK006C | Liverpool | 117.6 | 107.5 | 98.8 | 130.1 | 127.3 | 120.6 |
| | UK007C | Edinburgh | -[b] | 92.6 | 87.3 | -[b] | 101.4 | 97.0 |
| | UK008C | Manchester | 122.6 | 108.7 | 101.5[d] | 121.7 | 117.2 | 121.0[d] |
| | UK009C | Cardiff | 95.4 | 88.6 | 86.0 | 103.1 | 97.1 | 96.7 |
| | UK010C | Sheffield | 98.1 | 87.7 | 82.2 | 106.4 | 103.6 | 102.2 |
| | UK011C | Bristol | 97.7 | 87.3 | 88.4 | 103.6 | 100.7 | 96.9 |
| | UK012C | Belfast | -[b] | 105.1 | 106.8 | -[b] | 107.0 | 111.5 |
| | UK013C | Newcastle upon Tyne | 107.9 | 99.4 | 94.3 | 114.0 | 103.1 | 103.3 |
| | UK014C | Leicester | 104.1 | 93.5[d] | 96.0[d] | 115.7 | 116.1[d] | 111.2[d] |
| | UK015C | Derry | -[b] | 92.5 | 89.6 | -[b] | 113.4 | 102.8 |
| | UK016C | Aberdeen | 105.6 | 95.7 | 91.7 | 107.2 | 109.5 | 107.6 |
| | UK017C | Cambridge | 86.1 | 80.6 | 83.1 | 96.8 | 100.3 | 96.8 |
| | UK018C | Exeter | 87.2 | 89.8 | 73.8 | 97.0 | 94.8 | 94.9 |
| | UK019C | Lincoln | 98.4 | 89.9 | 86.0[d] | 93.5 | 99.1 | 108.4[d] |
| | UK020C | Gravesham | 86.5 | 74.4 | 75.7 | 96.7 | 99.1 | 88.9 |
| | UK021C | Stevenage | 87.1 | 82.4 | 84.4 | 99.6 | 86.5 | 83.0 |
| | UK022C | Wrexham | 99.7 | 91.4 | 85.9 | 118.0 | 104.9 | 101.5 |
| | UK023C | Portsmouth | 94.5 | 93.5 | 82.8 | 108.7 | 102.6 | 96.6 |
| | UK024C | Worcester | 92.3 | 78.7 | 89.1 | 100.0 | 104.9 | 94.7 |
| | UK025C | Coventry | -[b] | 92.4 | 88.8 | -[b] | 100.0 | 100.3 |
| | UK026C | Kingston-upon-Hull | -[b] | 97.0 | 95.5 | -[b] | 114.3 | 104.8 |
| | UK027C | Stoke-on-Trent | -[b] | 102.4 | 93.0[d] | -[b] | 109.7 | 116.0[d] |
| | UK028C | Wolverhampton | -[b] | 93.5 | 87.5 | -[b] | 104.7 | 102.1 |
| | UK029C | Nottingham | -[b] | 99.7 | 93.9[d] | -[b] | 107.5 | 109.1[d] |
| | UK030C | Wirral | -[b] | 93.3 | 86.1 | -[b] | 103.3 | 105.2 |

Footnote:

Wave one: 1999-2002; wave two: 2003-2006; wave three: 2007-2009.