# Spatial Incorporation of Multiple Immigrant Groups in Gateway Cities: Comparative Analysis of Sydney, Barcelona, and Prague - Online Appendix

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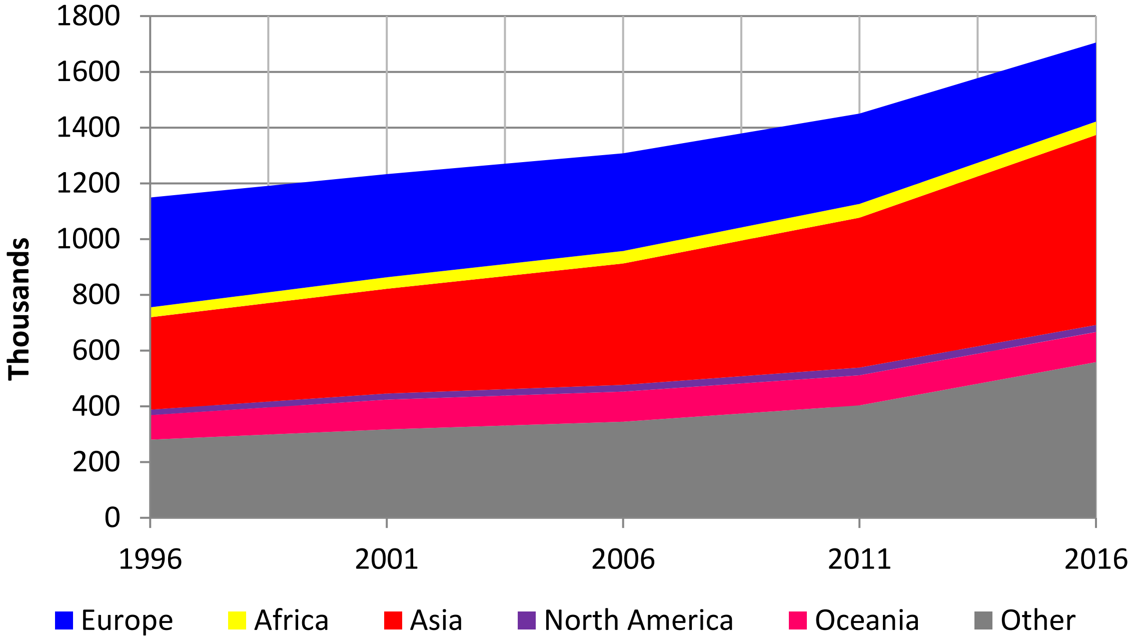
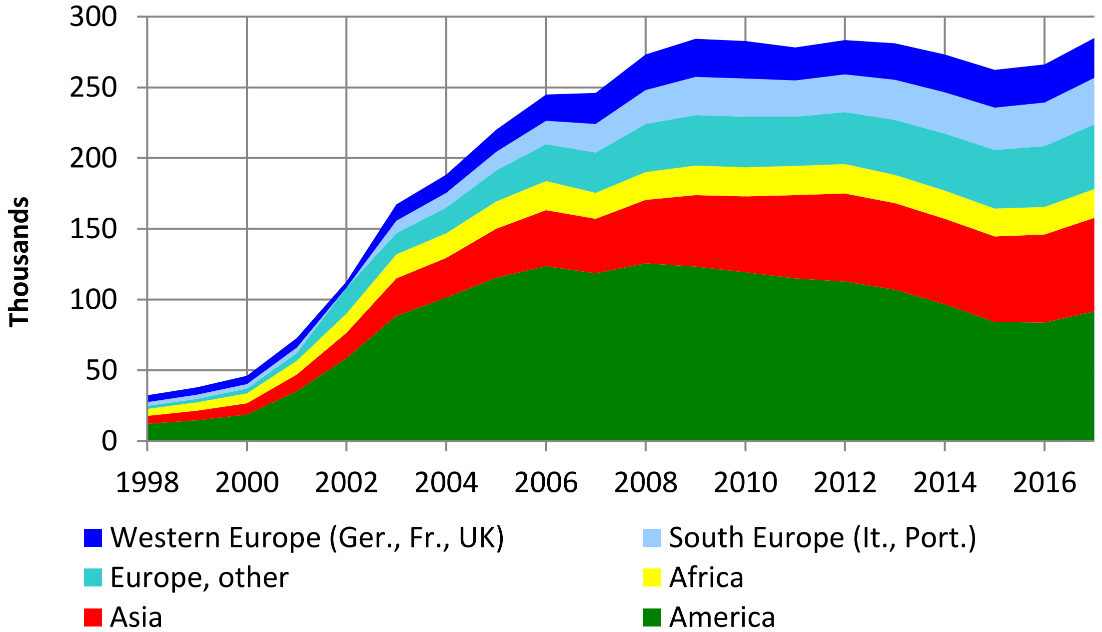
## A1. Destination cities

**Figure A1.** Main regions of birth of immigrant groups in Sydney, 1996-2016.



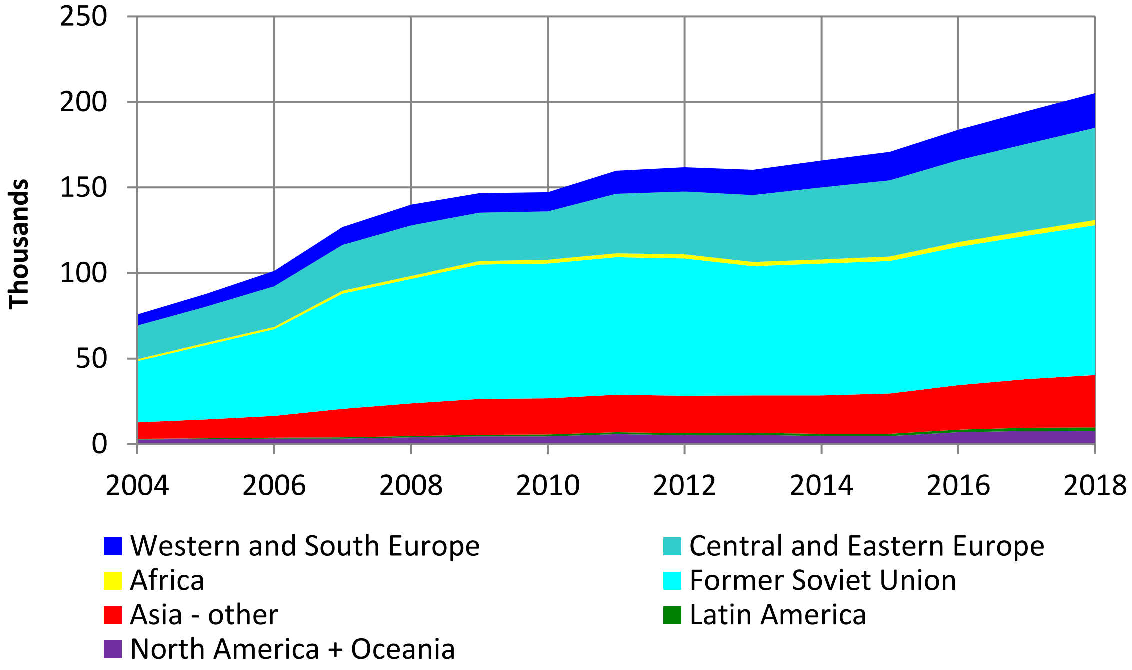

Source: Australian Bureau of Statistics

**Figure A2.** Main regions of citizenship of immigrant groups in Barcelona, 1998-2017.




Source: Instituto Nacional de Estadística

**Figure A3.** Main regions of citizenship of immigrant groups in Prague, 2004-2018.




Source: Czech Statistical Office, Alien Police

## A2. Data and methods

### A2.1 Data

We analysed the most up-to-date and comparable data from the three studied cities on the number of immigrants based on their country of origin. Census data from 2016 (defined by country of birth) were used for Sydney, while data from continuous population registers (defined by country of citizenship) were used for Barcelona (from 1/1/2017) and Prague (from 31/12/2015). Notably, the difference between both definitions of country of origin should not influence our results since each city was analysed separately. Moreover, Hasman and Novotný (2017) showed that the spatial patterns observed when using migrants' citizenship and country of birth data were very similar.

Important decisions were made regarding (1) the scale of analysis and (2) the number and size of immigration groups analysed.[1] Concerning the former decision, some spatial analysis methods (e.g. spatial autocorrelation) require very detailed data. However, since the structure of administrative units in each city is very different, we could not obtain fully comparable data across cities. While the Census sections selected for Barcelona and the Basic settlement units for Prague are similar, smaller Statistical areas level 1 units were selected for Sydney as Statistical areas level 2 units with a mean population size of 15,752 would have been too

[1] The term "immigration group" refers to the set of all immigrants with the same country (or region) of origin.

large. Since this choice corresponds to higher proportions of immigrants in Sydney, the number of immigrants (and thus the possibility of detecting spatial patterns) is comparable to that of the other two cities. Unpopulated units (234 in Sydney and 160 in Prague) were excluded from the analysis. Further details regarding the selected spatial units (hereafter "localities") can be found in Table A1.

**Table A1.** Basic characteristics of the administrative units used in the analyses of immigration groups' spatial distribution.

| | Sydney | Barcelona | Prague |
|---|---|---|---|
| Number of locations | 9,753 | 1,068 | 758 |
| Total population | 4,221,411 | 1,620,809 | 1,267,246 |
| Mean population size | 433 | 1,518 | 1,672 |
| Immigrant population (%) | 43.6 | 17.6 | 13.3 |
| Immigrant population per location | 189 | 267 | 222 |

Source: Australian Bureau of Statistics, Czech Statistical Office, Instituto Nacional de Estadistica.

Another important issue involved deciding the size of immigrant groups to be included in the analysis. Notably, the analysis of very small groups may be problematic due to the larger role of random oscillations, the risk of which can be even greater since data from the Australian and Spanish statistical offices are deliberately inaccurate to ensure confidentiality. On the other hand, we aimed to include as many groups as possible to obtain the maximum amount of information and achieve the most complex pattern possible (which is also desirable for methods such as spatial relatedness). Thus, we chose a more inclusive approach and merged only the smallest groups (below 100 members) to regional aggregates in the case of Sydney (resulting in a total of 143 groups, including the domestic population) and below 70 members in the case of Prague (resulting in 95 groups), while larger groups were maintained. Since the data for Barcelona were divided into only 54 countries/regions of birth, all groups were retained.

Although the inclusion of small groups may be disputable, we believe that our findings may give rise to recommendations for future research in terms of the appropriate group size for such quantitative analyses. Moreover, their inclusion can bring added value when compared to many existing studies that were limited to only a few selected groups and thus ignored the complexity of destination societies provided by the presence of multiple groups (Alba and Nee 1997). Furthermore, it should be useful in determining which group could bring useful information. Additionally, the inclusion of most groups may be beneficial for further case studies of these groups by providing basic information about their spatial patterns. However, the inclusion of small groups should be considered when interpreting our results. We also had to adjust our methods to minimise the potential bias caused by these small groups.

To evaluate the role of generational change in immigrant incorporation highlighted by assimilation theories (Alba and Nee 1997), we adopted an alternative approach to the longitudinal and cohort analyses most frequently used in the incorporation literature. Since data on the residential distribution of immigrant group generations in all three cities were unavailable, we collected data on the proportion of the population (excluding children up to 10 years) residing in each destination city for over 10 years for each immigrant group. We employed the most up-to-date data from the most recent censuses (2016 for Sydney and 2011 for Barcelona)[2] and the population register for Prague (Table A2)[3].

**Table A2.** Descriptive statistics of the length of stay indicator

| City | Mean | Standard deviation | Minimum | Maximum |
|---|---|---|---|---|
| Sydney | 0.669 | 0.194 | 0.059 | 0.989 |
| Barcelona | 0.274 | 0.177 | 0.000 | 1.000 |
| Prague | 0.206 | 0.123 | 0.000 | 0.505 |

To display destination cities' spatial-economic segmentation, we created one map for each city. Since these maps intended to show only the basic features of the cities' structures, comparable data were not required and we utilised the most illustrative available data. For Sydney, we used mean personal income in Statistical areas level 2 units from the 2016 census (larger spatial units were more appropriate since a map for Statistical areas level 1 would be too fragmented). In the case of Barcelona, we used the average sales price of houses (by neighbourhood) in 2016 (Barcelona 2019). For Prague, data for building plots in Basic settlement units in 2015 were mapped (Praha 2018).

## A2.2 Methods

Given the supposed multidimensionality of spatial incorporation, we decided to measure the two dimensions that we considered most important for our paper: evenness and clustering (as defined by Massey and Denton 1988). Evenness measures the concentration of immigrant group members in localities (regardless of their location). Since the level of incorporation is

[2] Although a time gap exists between the census for Barcelona and the date of the population register data on immigrants' spatial patterns, we believe that the data are stable in time and that such a time gap should not affect our results.

[3] Due to a lack of alternative data, the indicator for Prague was calculated as the proportion of the given immigrant group residing in Prague in 2015 whose resident permit was issued in 2005 and who also resided in the Czech Republic in 2008.

highly scale-dependent (Johnston et al. 2016) and we used very detailed data, we can capture evenness at the finest level. Conversely, clustering quantifies whether members cluster together in localities with an overrepresentation of an immigrant group; thus, it can detect concentration at a higher spatial level.[4] Thus, both measures may—but do not have to—be correlated.

Measures of evenness are numerous and highly intercorrelated (Massey and Denton 1988). Table A3, which presents the Pearson's correlations between two classical measures (the Gini coefficient and index of dissimilarity) and one alternative ($D_{i,j}$, see below) measure of evenness, confirms that such high correlations also occurred within our data. However, all of these measures are also extremely correlated with group size.[5] This issue—often neglected in the segregation literature—is even more severe in our case since we also analysed small groups whose spatial distribution must be highly uneven because they can only live in a few localities (Manley, Jones, and Johnston 2019). Thus, we have thus taken this dependence into account as follows. For each group $i$, we have calculated the Gini coefficient (which is less correlated with group size than the more common index of dissimilarity) weighted by the population size of localities:

$$G_i = \frac{1}{2Y_i}\sum_{l=1}^{n}\sum_{m=1}^{n}\left(\frac{x_l}{X}\frac{x_m}{X}\left|y_{i,l} - y_{i,m}\right|\right), \qquad (1)$$

where $n$ denotes the number of localities, $y_{i,l}$ and $y_{i,m}$ are the proportions of group $i$ in the populations in localities $l$ and $m$, $Y_i$ is the total population of group $i$ in the city, and $x_l$ and $x_m$ are the proportions of the total populations in localities $l$ and $m$ relative to the total population in city $X$. The minimum value of the Gini coefficient is 0, meaning absolute evenness ($y_i$ being the same across localities), and its maximum value is 1, representing absolute unevenness (all members of a group are concentrated in only one locality). To remove the influence of group size on the Gini coefficient, we used a regression analysis to model the relationship between the Gini coefficient and group size for each city. A quadratic function was the most appropriate for Sydney ($R^2$ = 88.0%) and a linear function was most appropriate for the other cities ($R^2$ = 77.6% for Barcelona and 86.0% for Prague). For each group in each city, we then computed the differences between the original values of the Gini coefficient and the values predicted by the regression model. These residuals ($RG_i$) allowed us to determine

[4] Another way how we could have analysed spatial concentration on more spatial levels would be to use data on more spatial scales. However, suitable data were not available for Prague and Barcelona.
[5] Since the group size distributions were highly skewed in all cities, we used their logarithms in our analyses.

the real evenness of group *i* independent of its representation in a city. Positive values imply that group members are more concentrated than would be expected based on their group size, while negative values signal their greater dispersion. For simplicity (and to have the same interpretation as the clustering measure), $RG_i$ is considered an indicator of unevenness (rather than evenness) in the present study.

**Table A3.** Pearson correlations for population size, evenness, and clustering measures

| | | Prague | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Group size | log10 (Group size) | Gini coefficient | Index of dissimilarity | $D_{i,j}$ | $RG_i$ | Moran's I |
| Sydney | Group size | . | 0.659 | -0.629 | -0.530 | 0.269 | -0.056 | 0.048 |
| | log10 (group size) | 0.620 | . | -0.906 | -0.916 | 0.625 | 0.031 | 0.166 |
| | Gini coefficient | -0.790 | -0.830 | . | 0.976 | -0.751 | 0.396 | -0.040 |
| | Index of dissimilarity | -0.742 | -0.868 | 0.986 | . | -0.934 | 0.342 | -0.673 |
| | $D_{i,j}$ | 0.520 | 0.776 | -0.897 | -0.813 | . | -0.462 | 0.070 |
| | $RG_i$ | -0.104 | -0.018 | 0.428 | 0.318 | -0.419 | . | 0.266 |
| | Moran's I | 0.495 | 0.820 | -0.590 | -0.080 | 0.564 | 0.369 | . |

Source: Authors' calculations
Note: Values denote the extent of the Pearson correlations computed for Sydney (below diagonal) and Prague data separately. Correlations for Barcelona (not shown) are generally similar to those of Sydney.

To assess the degree of clustering, we calculated Moran's I, which is (for its simple interpretation similar to Pearson's correlation coefficient) one of the most widely used indicators of spatial autocorrelation (Cliff and Ord 1973). Its value is bounded between -1 and 1. Positive values denote the clustering of localities with a high share of group *i*, while negative values correspond to a situation (albeit improbable) in which localities with a high share are adjacent to localities with a low share. Finally, values near zero imply the absence of a spatial pattern in the distribution of group *i* across localities. Moran's I for group *i* is computed as follows (Netrdová and Nosek 2009):

$$I_i = \frac{\mathrm{n}\sum_{\mathrm{l}=1}^{\mathrm{n}}\sum_{\mathrm{m}=1}^{\mathrm{n}} \mathrm{w}_{\mathrm{l,m}}(\mathrm{y}_{\mathrm{i,l}}-y_i)(\mathrm{y}_{\mathrm{i,m}}-y_i)}{\sum_{\mathrm{l}=1}^{\mathrm{n}}\sum_{\mathrm{m}=1}^{\mathrm{n}} \mathrm{w}_{\mathrm{l,m}} \sum_{\mathrm{l}=1}^{\mathrm{n}}(\mathrm{y}_{i,l}-y_i)^2}, \qquad (2)$$

where $y_i$ denotes the mean share of group *i* in the whole city and $w_{l,m}$ corresponds to the weighting matrix, which defines neighbouring localities. Since the choice of weighting matrix may influence the resulting values of I, we tested several possibilities before finding the most appropriate solution for each city (the best choice differs between cities due to the different spatial structures of their administrative units). As a result, we selected a 10-nearest-neighbour matrix for Sydney, rook contiguity for Barcelona (also used by Martori, Hoberg, and Suriñach 2005) and a constant distance of 2 km for Prague.[6]

Pearson correlations indicate a moderate relationship between clustering measure $I_i$ and unevenness measure $RG_i$ (0.37 for Sydney and 0.27 for both Barcelona and Prague), confirming that both assess different aspects of segregation. Moreover, $I_i$ (like the Gini coefficient) is highly correlated with group size (Table A3). However, following additional inspections, we decided not to compute residual values since the relationship with group size was not as straightforward as in the case of the Gini coefficient. Although small groups typically have a small $I_i$, larger groups can have both a very high and a very low $I_i$; therefore, we could not identify a function that would adequately describe the relationship between $I_i$ and group size. Moreover, there was no relationship in the case of Prague since $I_i$ was very low for most groups.

To test a possible spatial aspect of the segmented assimilation theory, we evaluated whether (and to what extent) different groups were concentrated in different localities by considering the location of such concentrations and the groups' length of stay in each destination city. We computed the symmetric Dice coefficient $D_{i,j}$, which measures the so-called spatial relatedness of two immigrant groups. It corresponds to the probability that one group is concentrated in a locality in which a second group is also concentrated (Novotný and Hasman 2015). Local concentration $LQ_{i,l}$ is defined as $y_{i,l}/y_i$. Thus, we state that a group is concentrated in a locality when its $LQ_{i,l}$ is higher than 1 (i.e. its relative representation in the locality is higher than in the entire city). $D_{i,j}$ is then defined as the lower of the two asymmetric Dice coefficients:

$$D_{i,j} = \min\left(\frac{|\{l: LQ_{i,l} > 1\} \cap \{l: LQ_{j,l} > 1\}|}{|\{l: LQ_{j,l} > 1\}|}; \frac{|\{l: LQ_{i,l} > 1\} \cap \{l: LQ_{j,l} > 1\}|}{|\{l: LQ_{i,l} > 1\}|}\right), \quad (3)$$

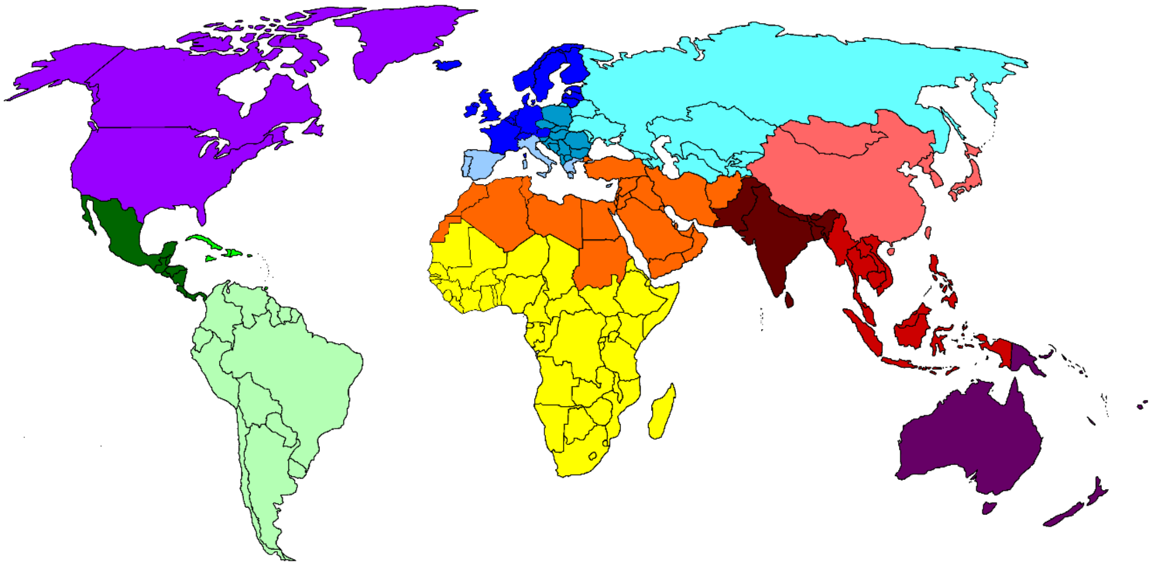
where $\{r$: $LQ_{i,l} > 1\}$ is the number of localities in which $LQ_{i,l} > 1$ and the term $|\{l: LQ_{i,l} > 1\} \cap \{l: LQ_{j,l} > 1\}|$ thus corresponds to the number of localities where both groups $i$ and $j$ are concentrated simultaneously (for a further discussion, see Hasman and Novotný 2018; Novotný and Hasman 2015). In contrast to the index of dissimilarity, which can also compare

[6] Different schemas would lead to nearly the same results as Pearson correlations between several of the most appropriate schemas were approximately 0.99 for Sydney and Barcelona and approximately 0.98 for Prague.

the spatial distribution of two groups, $D_{i,j}$ is much less dependent on group size, which makes it a more appropriate measure of evenness (see Table A3).

$D_{i,j}$ values were used to visualise the patterns of the spatial structure of immigrant groups in each city as an undirected network, where nodes represent particular groups and edges refer to the spatial relatedness between groups. Groups are coloured by their region (Figure A4) and labelled by acronyms corresponding (when possible) to ISO country codes. Node sizes correspond to the square root of groups' population size and shape in the proportion of immigrants with a length of stay greater than 10 years. Groups with this proportion above 80% are denoted by a circle, while those with 60–79.9% by an octagon, 40–59.9% by a hexagon, 20–39.9% by square and those below 20% by a triangle. The network visualisation was constructed using an edge-weighted spring-embedded algorithm, with the weights being linearly proportional to the values of $D_{i,j}$. Such a network can be considered analogous to a physical system in which nodes (immigrant groups) attract each other by forces proportional to their pairwise relatedness ($D_{i,j}$). The algorithm minimises the energy of the physical system and accordingly assigns positions in two-dimensional space to the nodes. Since the lowest $D_{i,j}$ values can be affected by the random co-occurrences of immigrants, only edges above the given bound were considered for creating the visualisation network. This bound differed for each city depending on its spatial pattern (0.05 in Sydney, 0.34 in Barcelona, and 0.333 in Prague) and was specified by testing several values. However, different bounds would not affect the general view of visualisations. Moreover, only the strongest edges (above 0.2, 0.45, and 0.43 for Sydney, Barcelona, and Prague, respectively) were displayed to maintain a readable visualisation.

**Figure A4.** Regional division of countries



The visualisations enabled us to comprehensively evaluate the patterns of the spatial structure of immigrant groups in each city to determine which groups may have mutually different spatial distributions (and be segmented to different parts of a city). The spatial distributions of such groups were ultimately compared using map outputs obtained from the LISA analysis (Anselin 1995). LISA (Local Indicators of Spatial Association) is a local equivalent of the "global" Moran's I that discovers clusters of localities with a high (or low) representation of a given group.

## A3. Supplementary data

**Table A4.** Main characteristics of population groups in Sydney, Barcelona, and Prague

| | | | Sydney | | | | Barcelona | | | | Prague | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name of group | Acronym | Region | Group size | Unevenness (RGi) | Clustering (Moran I) | Before 2001 (%) | Group size | Unevenness (RGi) | Clustering (Moran I) | Before 2006 (%) | Group size | Unevenness (RGi) | Clustering (Moran I) | Before 2001 (%) |
| Afghanistan | AFG | Middle East and North Africa | 11,733 | 0.068 | 0.593 | 52.4 | . | . | . | . | 185 | 0.080 | 0.000 | 23.8 |
| Africa, other | Afr | Sub-Saharan Africa | . | . | . | . | 3,604 | -0.012 | 0.299 | 38.2 | . | . | . | . |
| Albania | ALB | Central and Eastern Europe | 123 | 0.006 | -0.002 | 54.1 | . | . | . | . | 158 | 0.000 | -0.001 | 11.3 |
| Algeria | DZA | Middle East and North Africa | 314 | -0.006 | 0.090 | 74.9 | 1,733 | 0.165 | 0.195 | 64.7 | 386 | -0.069 | 0.013 | 40.0 |
| America, other | Ame | South America | . | . | . | . | 21,198 | -0.115 | 0.540 | 25.3 | . | . | . | . |
| Argentina | ARG | South America | 3,684 | -0.008 | 0.068 | 80.2 | 6,076 | -0.078 | 0.351 | 25.7 | 79 | -0.014 | 0.016 | 20.3 |
| Armenia | ARM | Former Soviet Union | 429 | -0.006 | 0.077 | 78.7 | . | . | . | . | 802 | 0.001 | 0.000 | 21.1 |
| Asia, other | Asi | Eastern Asia | . | . | . | . | 27,013 | 0.085 | 0.794 | 25.3 | 11 | -0.096 | -0.001 | 27.3 |
| Australia | AUS | Oceania | 2,380,213 | 0.032 | 0.598 | . | . | . | . | . | 274 | -0.012 | 0.061 | 29.5 |
| Austria | AUT | Western Europe | 1,140 | -0.006 | 0.084 | 91.2 | 722 | 0.007 | 0.287 | 30.4 | 640 | 0.006 | -0.002 | 50.6 |
| Azerbaijan | AZE | Former Soviet Union | . | . | . | . | . | . | . | . | 620 | 0.041 | -0.006 | 3.9 |
| Bahrain | BHR | Middle East and North Africa | 128 | 0.005 | 0.005 | 59.2 | . | . | . | . | . | . | . | . |
| Bangladesh | BGD | South Asia | 22,240 | 0.085 | 0.706 | 44.5 | . | . | . | . | 97 | 0.044 | -0.002 | 9.3 |
| Belarus | BLR | Former Soviet Union | 190 | -0.003 | 0.000 | 56.3 | . | . | . | . | 2,137 | -0.084 | 0.011 | 10.3 |
| Belgium | BEL | Western Europe | 526 | -0.007 | 0.015 | 61.9 | 1,537 | 0.001 | 0.319 | 51.2 | 282 | 0.042 | 0.087 | 20.1 |
| Bhutan | BTN | South Asia | 297 | -0.004 | 0.085 | 5.9 | . | . | . | . | . | . | . | . |
| Bolivia | BOL | South America | 231 | -0.002 | 0.026 | 85.5 | 9,024 | -0.019 | 0.451 | 5.5 | . | . | . | . |
| Bosnia and Herzegovina | BIH | Central and Eastern Europe | 5,145 | 0.005 | 0.296 | 95.2 | . | . | . | . | 915 | -0.022 | 0.000 | 43.0 |
| Brazil | BRA | South America | 10,148 | 0.027 | 0.399 | 23.7 | 6,339 | -0.149 | 0.347 | 19.6 | 212 | -0.052 | 0.033 | 11.8 |
| Brunei | BRN | South-East Asia | 180 | 0.001 | 0.074 | 65.5 | . | . | . | . | . | . | . | . |
| Bulgaria | BGR | Central and Eastern Europe | 495 | -0.007 | 0.022 | 67.9 | 1,930 | 0.088 | 0.131 | 15.8 | 3,892 | -0.088 | -0.006 | 18.8 |
| Burma | MMR | South-East Asia | 5,147 | 0.025 | 0.399 | 53.3 | . | . | . | . | . | . | . | . |
| Cambodia | KHM | South-East Asia | 11,035 | 0.082 | 0.598 | 80.2 | . | . | . | . | . | . | . | . |
| Canada | CAN | North America | 6,561 | -0.026 | 0.155 | 62.7 | . | . | . | . | 443 | -0.006 | 0.017 | 25.5 |
| Caribbean, other | Car | Caribbean | 226 | -0.003 | 0.000 | 75.0 | . | . | . | . | 30 | -0.055 | -0.008 | 30.0 |
| Central America, other | CAm | Central America | 135 | 0.004 | -0.003 | 66.4 | . | . | . | . | 108 | -0.029 | 0.010 | 11.9 |
| Central and West Africa, other | CWA | Sub-Saharan Africa | 192 | -0.002 | 0.003 | 56.6 | . | . | . | . | 354 | -0.085 | 0.039 | 22.4 |
| Colombia | COL | South America | 4,942 | -0.005 | 0.155 | 36.4 | 9,004 | -0.213 | 0.208 | 19.5 | 139 | -0.012 | 0.023 | 14.4 |
| Congo, DR | ZAR | Sub-Saharan Africa | 158 | 0.002 | 0.001 | 43.1 | . | . | . | . | . | . | . | . |
| Cook Islands | COK | Oceania | 1,363 | 0.003 | 0.113 | 78.4 | . | . | . | . | . | . | . | . |
| Croatia | HRV | Central and Eastern Europe | 10,831 | -0.013 | 0.304 | 97.4 | 303 | -0.036 | 0.061 | 42.9 | 1,345 | -0.016 | -0.003 | 48.8 |
| Cuba | CUB | Caribbean | . | . | . | . | 2,059 | -0.138 | 0.060 | 31.5 | 224 | -0.006 | 0.006 | 20.5 |
| Cyprus | CYP | South Europe | 4,411 | 0.004 | 0.191 | 97.4 | 88 | 0.007 | 0.029 | 0.0 | . | . | . | . |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Czech Republic | CZE | Central and Eastern Europe | 1,674 | -0.001 | 0.067 | 62.6 | 495 | -0.015 | 0.125 | 17.5 | 1,099,078 | -0.032 | 0.037 | . |
| Denmark | DNK | Western Europe | 615 | -0.006 | 0.017 | 79.3 | 595 | 0.016 | 0.300 | 48.6 | 206 | 0.033 | 0.243 | 21.8 |
| Dominican Rep. | DOM | Caribbean | . | . | . | . | 5,736 | -0.015 | 0.294 | 25.0 | . | . | . | . |
| East Africa, other | EAf | Sub-Saharan Africa | 211 | -0.003 | 0.001 | 62.8 | . | . | . | . | 144 | 0.029 | -0.002 | 12.5 |
| East Europe, other | EEu | Central and Eastern Europe | 696 | -0.007 | 0.024 | 88.8 | . | . | . | . | . | . | . | . |
| Ecuador | ECU | South America | 692 | -0.006 | 0.016 | 82.7 | 7,978 | -0.12 | 0.460 | 24.2 | . | . | . | . |
| Egypt | EGY | Middle East and North Africa | 16,237 | -0.049 | 0.295 | 79.0 | . | . | . | . | 293 | -0.053 | 0.019 | 15.8 |
| El Salvador | SLV | Central America | 1,138 | -0.002 | 0.084 | 96.7 | . | . | . | . | . | . | . | . |
| England | ENG | Western Europe | 129,138 | -0.119 | 0.671 | 76.0 | . | . | . | . | . | . | . | . |
| Eritrea | ERI | Sub-Saharan Africa | 105 | 0.010 | 0.007 | 60.2 | . | . | . | . | . | . | . | . |
| Estonia | EST | Central and Eastern Europe | 192 | -0.001 | 0.003 | 57.8 | 191 | 0.082 | 0.032 | . | 93 | -0.005 | 0.024 | 16.1 |
| Ethiopia | ETH | Sub-Saharan Africa | 727 | -0.005 | 0.056 | 60.0 | . | . | . | . | . | . | . | . |
| Europe, other | Eur | Western Europe | . | . | . | . | 9,128 | -0.061 | 0.214 | 54.7 | 127 | -0.010 | 0.010 | 28.3 |
| Fiji | FJI | Oceania | 29,161 | -0.010 | 0.533 | 79.8 | . | . | . | . | . | . | . | . |
| Finland | FIN | Western Europe | 443 | -0.008 | -0.001 | 76.6 | 499 | 0.015 | 0.233 | 25.0 | 200 | 0.004 | 0.008 | 20.0 |
| France | FRA | Western Europe | 7,533 | 0.003 | 0.393 | 44.0 | 14,285 | 0.138 | 0.716 | 37.6 | 2,315 | 0.131 | 0.082 | 22.0 |
| Gaza Strip | GAZ | Middle East and North Africa | 857 | -0.003 | 0.101 | 82.0 | . | . | . | . | . | . | . | . |
| Georgia | GEO | Former Soviet Union | . | . | . | . | . | . | . | . | 540 | 0.011 | 0.002 | 18.1 |
| Germany | DEU | Western Europe | 14,049 | -0.084 | 0.133 | 78.4 | 6,808 | -0.011 | 0.691 | 49.4 | 3,431 | -0.007 | 0.009 | 35.4 |
| Ghana | GHA | Sub-Saharan Africa | 1,700 | 0.003 | 0.108 | 58.5 | . | . | . | . | 143 | 0.072 | 0.001 | 11.9 |
| Greece | GRC | South Europe | 25,058 | 0.025 | 0.618 | 94.9 | 1,034 | 0.023 | 0.262 | 19.9 | 404 | -0.063 | 0.043 | 32.7 |
| Guinea | GIN | Sub-Saharan Africa | 115 | 0.007 | 0.025 | 27.8 | . | . | . | . | . | . | . | . |
| Hong Kong | HKG | Eastern Asia | 38,669 | -0.042 | 0.585 | 82.1 | . | . | . | . | . | . | . | . |
| Hungary | HUN | Central and Eastern Europe | 3,220 | 0.005 | 0.081 | 84.2 | 783 | 0.079 | 0.215 | 8.2 | 1,453 | -0.134 | -0.013 | 9.3 |
| Chile | CHL | South America | 9,251 | -0.020 | 0.207 | 87.1 | 3,778 | -0.095 | 0.257 | 18.3 | . | . | . | . |
| China | CHN | Eastern Asia | 221,952 | 0.109 | 0.706 | 48.1 | 19,783 | 0.128 | 0.444 | 27.8 | 3,956 | 0.076 | 0.025 | 24.5 |
| India | IND | South Asia | 127,553 | 0.098 | 0.744 | 37.1 | . | . | . | . | 1,026 | 0.042 | 0.005 | 5.8 |
| Indonesia | IDN | South-East Asia | 27,611 | -0.008 | 0.510 | 60.1 | . | . | . | . | 99 | 0.018 | 0.007 | 22.2 |
| Iran | IRN | Middle East and North Africa | 20,007 | -0.024 | 0.252 | 48.5 | . | . | . | . | 214 | 0.055 | -0.005 | 8.4 |
| Iraq | IRQ | Middle East and North Africa | 38,309 | 0.161 | 0.861 | 50.8 | . | . | . | . | 136 | -0.019 | 0.002 | 26.5 |
| Ireland | IRL | Western Europe | 16,036 | -0.036 | 0.443 | 57.0 | 1,061 | -0.006 | 0.359 | 32.2 | 520 | 0.069 | 0.028 | 22.8 |
| Israel | ISR | Middle East and North Africa | 2,170 | 0.010 | 0.398 | 76.7 | . | . | . | . | 481 | 0.021 | 0.092 | 18.9 |
| Italy | ITA | South Europe | 37,411 | -0.069 | 0.486 | 87.8 | 28,534 | 0.038 | 0.800 | 20.8 | 2,230 | 0.079 | 0.030 | 28.8 |
| Japan | JPN | Eastern Asia | 10,226 | 0.002 | 0.391 | 59.6 | . | . | . | . | 883 | 0.151 | 0.006 | 7.1 |
| Jordan | JOR | Middle East and North Africa | 2,489 | 0.001 | 0.130 | 68.4 | . | . | . | . | 93 | 0.001 | -0.003 | 46.2 |
| Kazakhstan | KAZ | Former Soviet Union | 185 | -0.001 | 0.019 | 47.7 | . | . | . | . | 3,234 | 0.032 | 0.000 | 6.9 |
| Kenya | KEN | Sub-Saharan Africa | 1,332 | -0.003 | 0.021 | 61.7 | . | . | . | . | . | . | . | . |
| Korea, South | KOR | Eastern Asia | 47,645 | 0.077 | 0.563 | 56.8 | . | . | . | . | 793 | 0.129 | 0.057 | 3.2 |
| Kosovo | KOS | Central and Eastern Europe | 104 | 0.010 | 0.025 | 83.4 | . | . | . | . | 324 | 0.054 | 0.016 | 23.4 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kuwait | KWT | Middle East and North Africa | 1,478 | -0.004 | 0.066 | 58.2 | . | . | . | . | . | . | . | . |
| Kyrgyzstan | KGZ | Former Soviet Union | . | . | . | . | . | . | . | . | 378 | 0.009 | 0.004 | 4.7 |
| Laos | LAO | South-East Asia | 4,190 | 0.033 | 0.482 | 93.1 | . | . | . | . | . | . | . | . |
| Latvia | LVA | Central and Eastern Europe | 277 | -0.005 | 0.000 | 84.0 | 286 | 0.095 | 0.093 | 0.0 | 193 | -0.019 | -0.004 | 12.9 |
| Lebanon | LBN | Middle East and North Africa | 53,988 | 0.073 | 0.757 | 87.6 | . | . | . | . | 118 | -0.026 | -0.003 | 47.5 |
| Liberia | LBR | Sub-Saharan Africa | 323 | -0.005 | 0.045 | 53.0 | . | . | . | . | . | . | . | . |
| Libya | LBY | Middle East and North Africa | 124 | 0.006 | 0.000 | 59.6 | . | . | . | . | 80 | 0.029 | -0.001 | 20.0 |
| Lithuania | LTU | Central and Eastern Europe | 377 | -0.006 | 0.003 | 52.3 | 425 | 0.103 | 0.123 | 0.0 | 264 | -0.024 | -0.002 | 20.5 |
| Luxembourg | LUX | Western Europe | . | . | . | . | 32 | -0.091 | 0.050 | . | . | . | . | . |
| Macau | MAC | Eastern Asia | 466 | -0.008 | 0.009 | 80.7 | . | . | . | . | . | . | . | . |
| Macedonia | MKD | Central and Eastern Europe | 9,965 | 0.040 | 0.542 | 93.2 | . | . | . | . | 834 | -0.064 | 0.029 | 16.3 |
| Malaysia | MYS | South-East Asia | 26,040 | -0.094 | 0.359 | 69.8 | . | . | . | . | 109 | 0.059 | 0.047 | 0.0 |
| Malta | MLT | South Europe | 9,431 | 0.010 | 0.342 | 98.9 | 29 | -0.142 | 0.066 | 100.0 | . | . | . | . |
| Mauritius | MUS | Sub-Saharan Africa | 3,753 | -0.005 | 0.070 | 81.6 | . | . | . | . | . | . | . | . |
| MENA, other | MENA | Middle East and North Africa | 466 | -0.006 | 0.062 | 64.7 | . | . | . | . | 218 | 0.021 | -0.002 | 23.9 |
| Mexico | MEX | Central America | 921 | -0.008 | 0.023 | 31.0 | . | . | . | . | 238 | -0.052 | 0.014 | 5.5 |
| Moldova | MDA | Former Soviet Union | . | . | . | . | . | . | . | . | 1,522 | -0.107 | -0.003 | 8.5 |
| Mongolia | MNG | Eastern Asia | 1,429 | 0.017 | 0.243 | 6.6 | . | . | . | . | 759 | 0.047 | 0.009 | 9.6 |
| Montenegro | MNE | Central and Eastern Europe | 167 | 0.000 | 0.007 | 85.7 | . | . | . | . | 96 | -0.008 | -0.003 | 31.3 |
| Morocco | MAR | Middle East and North Africa | 239 | -0.003 | 0.022 | 60.5 | 12,803 | 0.088 | 0.484 | 38.7 | 122 | -0.052 | 0.017 | 39.3 |
| Nepal | NPL | South Asia | 29,878 | 0.128 | 0.645 | 9.1 | . | . | . | . | 84 | 0.055 | 0.003 | 3.6 |
| Netherlands | NLD | Western Europe | 5,618 | -0.017 | 0.109 | 81.7 | 2,759 | 0.075 | 0.523 | 40.5 | 819 | 0.026 | 0.081 | 28.0 |
| New Caledonia | NCL | Oceania | 117 | 0.007 | 0.016 | 75.2 | . | . | . | . | . | . | . | . |
| New Zealand | NZL | Oceania | 78,627 | -0.282 | 0.125 | 73.3 | . | . | . | . | . | . | . | . |
| Nicaragua | NIC | Central America | 233 | -0.003 | 0.002 | 91.8 | . | . | . | . | . | . | . | . |
| Nigeria | NGA | Sub-Saharan Africa | 1,474 | 0.000 | 0.089 | 36.0 | 907 | 0.196 | 0.478 | 26.7 | 410 | -0.042 | 0.031 | 16.1 |
| Niue | NIU | Oceania | 115 | 0.007 | 0.036 | 75.8 | . | . | . | . | . | . | . | . |
| Northern Ireland | NIR | Western Europe | 2,035 | -0.005 | 0.022 | 78.1 | . | . | . | . | . | . | . | . |
| Norway | NOR | Western Europe | 311 | -0.006 | 0.023 | 55.6 | 384 | 0.012 | 0.193 | 38.5 | 145 | 0.026 | 0.003 | 24.0 |
| Oceania and Stateless | Oce | Oceania | . | . | . | . | 512 | -0.012 | 0.329 | 41.3 | . | . | . | . |
| Oceania, other | Oce | Oceania | 188 | -0.001 | -0.003 | 74.1 | . | . | . | . | 67 | -0.021 | 0.014 | 23.9 |
| Oman | OMN | Middle East and North Africa | 158 | 0.001 | 0.072 | 35.0 | . | . | . | . | . | . | . | . |
| Other | Oth | Other | 271,275 | -0.151 | 0.202 | 71.7 | . | . | . | . | . | . | . | . |
| Pakistan | PAK | South Asia | 21,809 | 0.037 | 0.609 | 36.8 | 19,196 | 0.205 | 0.691 | 24.3 | 292 | 0.064 | 0.002 | 23.6 |
| Papua New Guinea | PNG | Oceania | 1,539 | 0.000 | 0.089 | 91.9 | . | . | . | . | . | . | . | . |
| Paraguay | PRY | South America | . | . | . | . | 3,968 | 0.024 | 0.155 | 11.5 | . | . | . | . |
| Peru | PER | South America | 3,749 | -0.006 | 0.033 | 69.4 | 8,316 | -0.061 | 0.250 | 21.8 | 88 | -0.023 | -0.002 | 23.0 |
| Philippines | PHL | South-East Asia | 72,271 | -0.046 | 0.592 | 66.4 | . | . | . | . | 318 | 0.082 | -0.001 | 5.0 |
| Poland | POL | Central and Eastern Europe | 8,696 | -0.041 | 0.012 | 83.5 | 2,611 | 0.049 | 0.238 | 33.5 | 2,821 | -0.115 | 0.006 | 43.1 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Portugal | PRT | South Europe | 5,329 | 0.017 | 0.409 | 89.2 | 4,391 | -0.083 | 0.324 | 26.0 | 203 | -0.004 | -0.002 | 11.3 |
| Qatar | QAT | Middle East and North Africa | 101 | 0.010 | 0.012 | 50.2 | . | . | . | . | . | . | . | . |
| Romania | ROM | Central and Eastern Europe | 1,820 | -0.004 | 0.026 | 79.6 | 6,985 | -0.107 | 0.152 | 9.1 | 2,455 | -0.116 | 0.005 | 5.7 |
| Russia | RUS | Former Soviet Union | 5,348 | -0.005 | 0.182 | 57.0 | 6,980 | -0.099 | 0.273 | 21.4 | 21,115 | 0.069 | 0.039 | 10.8 |
| Samoa | WSM | Oceania | 7,212 | 0.024 | 0.418 | 66.6 | . | . | . | . | . | . | . | . |
| Saudi Arabia | SAU | Middle East and North Africa | 2,084 | 0.008 | 0.158 | 29.3 | . | . | . | . | . | . | . | . |
| Scotland | SCO | Western Europe | 12,903 | -0.079 | 0.164 | 82.4 | . | . | . | . | . | . | . | . |
| Senegal | SEN | Sub-Saharan Africa | . | . | . | . | 1,293 | 0.179 | 0.295 | 26.4 | . | . | . | . |
| Serbia | YUG | Central and Eastern Europe | 4,619 | 0.007 | 0.242 | 91.1 | . | . | . | . | 1,720 | -0.075 | 0.002 | 38.0 |
| Serbia and Montenegro | YUG | Central and Eastern Europe | . | . | . | . | . | . | . | . | 122 | -0.052 | 0.008 | 38.0 |
| Sierra Leone | SLE | Sub-Saharan Africa | 1,190 | 0.000 | 0.128 | 43.0 | . | . | . | . | . | . | . | . |
| Singapore | SGP | South-East Asia | 9,131 | -0.035 | 0.169 | 68.0 | . | . | . | . | . | . | . | . |
| Slovakia | SVK | Central and Eastern Europe | 1,159 | -0.005 | 0.057 | 58.0 | 347 | -0.032 | 0.078 | 25.0 | 26,913 | -0.119 | 0.008 | 31.8 |
| Slovenia | SVN | Central and Eastern Europe | 551 | -0.006 | 0.017 | 90.5 | 158 | -0.098 | 0.109 | 0.0 | 220 | 0.003 | -0.003 | 33.5 |
| Solomon Islands | SLB | Oceania | 136 | 0.004 | 0.040 | 84.5 | . | . | . | . | . | . | . | . |
| Somalia | SOM | Sub-Saharan Africa | 647 | -0.003 | 0.139 | 66.8 | . | . | . | . | . | . | . | . |
| South Africa | ZAF | Sub-Saharan Africa | 31,731 | -0.032 | 0.422 | 70.7 | . | . | . | . | 105 | -0.023 | 0.032 | 26.4 |
| South Africa, other | SAf | Sub-Saharan Africa | 180 | -0.001 | 0.004 | 67.4 | . | . | . | . | 135 | -0.004 | 0.004 | 28.1 |
| South America, other | SAm | South America | 122 | 0.006 | -0.002 | 81.5 | . | . | . | . | 210 | -0.054 | 0.015 | 22.4 |
| South and Central Asia, other | SCA | Former Soviet Union | 342 | -0.005 | 0.001 | 47.4 | . | . | . | . | 74 | -0.020 | 0.006 | 20.3 |
| South Eastern Europe, other | SEE | Central and Eastern Europe | 4,547 | 0.001 | 0.190 | 98.1 | . | . | . | . | . | . | . | . |
| South Sudan | SSD | Sub-Saharan Africa | 660 | -0.004 | 0.065 | 66.0 | . | . | . | . | . | . | . | . |
| South-East Asia, nfd | SEA | South-East Asia | . | . | . | . | . | . | . | . | 78 | 0.036 | 0.004 | 9.0 |
| Spain | ESP | South Europe | 3,064 | -0.002 | 0.082 | 64.3 | 1,335,902 | -0.024 | 0.759 | 97.8 | 701 | -0.036 | 0.003 | 17.1 |
| Sri Lanka | LKA | South Asia | 25,022 | 0.030 | 0.594 | 63.7 | . | . | . | . | . | . | . | . |
| Sudan | SDN | Middle East and North Africa | 3,987 | 0.017 | 0.238 | 77.5 | . | . | . | . | . | . | . | . |
| Sweden | SWE | Western Europe | 1,215 | -0.004 | 0.096 | 56.9 | 1,837 | 0.135 | 0.537 | 17.4 | 424 | -0.013 | 0.121 | 30.7 |
| Switzerland | CHE | Western Europe | 1,241 | -0.003 | 0.038 | 72.9 | . | . | . | . | 245 | 0.005 | 0.033 | 41.6 |
| Syria | SYR | Middle East and North Africa | 7,663 | 0.032 | 0.456 | 54.9 | . | . | . | . | 347 | -0.014 | -0.003 | 28.3 |
| Taiwan | TWN | Eastern Asia | 10,377 | 0.002 | 0.329 | 58.3 | . | . | . | . | 131 | 0.038 | 0.002 | 5.3 |
| Tajikistan | TJK | Former Soviet Union | . | . | . | . | . | . | . | . | 91 | 0.038 | -0.006 | 3.3 |
| Tanzania | TZA | Sub-Saharan Africa | 216 | -0.003 | -0.004 | 73.7 | . | . | . | . | . | . | . | . |
| Thailand | THA | South-East Asia | 20,520 | 0.024 | 0.423 | 43.1 | . | . | . | . | 430 | 0.110 | 0.047 | 7.7 |
| Timor-Leste | TMP | South-East Asia | 1,465 | 0.007 | 0.107 | 97.7 | . | . | . | . | . | . | . | . |
| Tokelau | TKL | Oceania | 200 | 0.000 | 0.053 | 62.3 | . | . | . | . | . | . | . | . |
| Tonga | TON | Oceania | 4,119 | 0.004 | 0.159 | 79.1 | . | . | . | . | . | . | . | . |
| Tunisia | TUN | Middle East and North Africa | . | . | . | . | . | . | . | . | 317 | -0.110 | 0.010 | 27.4 |
| Turkey | TUR | Middle East and North Africa | 10,131 | 0.012 | 0.489 | 84.8 | . | . | . | . | 724 | -0.006 | 0.016 | 14.6 |
| Uganda | UGA | Sub-Saharan Africa | 283 | -0.005 | 0.000 | 68.2 | . | . | . | . | . | . | . | . |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UK | GBR | Western Europe | 658 | -0.007 | 0.020 | 60.8 | 7,127 | -0.051 | 0.741 | 34.8 | 3,214 | 0.071 | 0.068 | 20.4 |
| Ukraine | UKR | Former Soviet Union | 3,131 | 0.013 | 0.243 | 76.3 | 4,530 | 0.081 | 0.109 | 23.6 | 45,221 | -0.028 | 0.007 | 12.5 |
| United Arab Emirates | ARE | Middle East and North Africa | 1,353 | -0.007 | 0.020 | 43.4 | . | . | . | . | . | . | . | . |
| Uruguay | URY | South America | 3,671 | 0.005 | 0.056 | 96.6 | 1,461 | -0.067 | 0.085 | 20.3 | . | . | . | . |
| USA | USA | North America | 19,011 | -0.061 | 0.395 | 55.5 | . | . | . | . | 3,560 | 0.059 | 0.039 | 24.9 |
| Uzbekistan | UZB | Former Soviet Union | 230 | -0.003 | -0.001 | 50.3 | . | . | . | . | 1,251 | 0.018 | 0.003 | 2.7 |
| Venezuela | VEN | South America | 1,117 | -0.003 | 0.028 | 33.7 | 6,252 | -0.161 | 0.282 | 9.9 | . | . | . | . |
| Vietnam | VNM | South-East Asia | 79,276 | 0.139 | 0.812 | 76.9 | . | . | . | . | 11,516 | 0.114 | 0.133 | 38.0 |
| Wales | WAL | Western Europe | 1,973 | -0.004 | 0.038 | 74.1 | . | . | . | . | . | . | . | . |
| Zambia | ZMB | Sub-Saharan Africa | 172 | -0.001 | 0.009 | 75.1 | . | . | . | . | . | . | . | . |
| Zimbabwe | ZWE | Sub-Saharan Africa | 3,049 | -0.003 | 0.052 | 58.1 | . | . | . | . | . | . | . | . |

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