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The Integrated Impact Indicator (I3), the top-10% Excellence Indicator, and the use of non-parametric statistics

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Section 3: The Value of Bibliometrics

Bibliometrics and Urban Research Part II: Mapping author affiliations

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The previous issue of **Research Trends** presented a preliminary keyword analysis of urban research, in which three branches of the overall discipline are defined and contrasted. The analysis shows that not only do researchers in these three areas discuss different elements of urban studies, they also tend to be based in different countries. Together these suggest a "limited integration of research efforts undertaken by those who work explicitly in urban studies, social scientists who work in cities, and scientists who are concerned with the environmental impacts of urban development." (1,2)

As well as looking at the countries that authors come from, it is also possible to look at author distributions in finer detail: rather than assigning all authors with a UK affiliation to the nation as a whole, we can view the specific locations of each affiliation on a map (and only group together those that are actually in the same place). The methods used to map author affiliations from the Scopus database are set out by Bornmann et al., (3) and here we follow their process to show author distributions in the three branches of urban research: Sciences, Social Sciences and Urban Studies.

The affiliation plot

There are certain differences when you work using a full author affiliation, rather than country data alone. First, papers can be assigned to multiple locations within a country: for example, a paper co-authored by researchers from institutes in Lille and Paris is shown at both locations, rather than as a single paper for France. Second, distributions within a country can be seen: for example, the capital city might be host to all of the active researchers in a country, or they could be spread across the country. Third, you can make direct comparisons between cities or institutes to see which published the most.

The first grouping of urban research consists of relevant papers within a set of 38 journals assigned to the Thomson-Reuters urban studies cluster. We have seen that papers come mainly from the US, the UK, Australia, Canada and Netherlands; but there is a long list beyond the top 5, and it quickly becomes difficult to retain a sense of all the countries. Plotting the locations on a map immediately shows you the distribution of authors and the quantities from different regions of the world (see Figure 1).

Large countries such as the US, Australia and China benefit particularly from such a map, as institutes across the country can be located and compared. In China's case, there are multiple papers from Beijing, Shanghai, Wuhan, Nanjing, Guangzhou, as well as Hong Kong.

The map also allows you to see the overall distribution at a single glance, including both the strong contributions in Europe and the US and the single papers from Argentina, Ghana, Nigeria, Ethiopia, Saudi Arabia, Pakistan, and Indonesia, among others.

In the map of 2010 author affiliations 389 locations are marked, accounting for the 643 articles and reviews published. Each location therefore accounts for 1.65 papers on average; this represents a slight increase from previous years, when locations have accounted for 1.5 to 1.6 papers (see Table 1).

Note: View the online version of this article to see an animated sequence of the author affiliation maps from 2006 through to 2010 (Figure 1b).

Publication year	Locations	Papers	Papers per location
2006	344	529	1.538
2007	347	553	1.594
2008	335	490	1.463
2009	371	553	1.491
2010	389	643	1.653

Table 1 – The number of locations (in author affiliations) for each year, and the number of papers published in each year in the urban studies grouping. Source: Scopus

From one discipline to another

The other two branches of urban research are those published in Social Science and in Science journals, respectively. These can be compared using the same approach as that used above, but instead here we alter the approach to look at only the authors of the top-cited papers in each discipline. As we are including both articles and reviews in the analysis, but these types of papers have different expected numbers of citations, we rank the articles and reviews separately, and take the top 10% of each according to citations. This allows us to map the distribution of the authors of the highest-impact articles and reviews together. Figure 2 shows the resulting distributions in the Social Sciences and Science clusters, plotted in different colors. Differences are apparent through a comparison of red (Social Science) and cyan (Science) authors. Some regions, such as South Africa and Australia, have more prominence in the Social Sciences; others, such as continental Europe, show a greater presence in the Sciences.

The maps of author affiliations show a finer level of detail than any aggregated country data can provide; and they allow for much more immediate interpretation of the affiliation data. We looked at the distributions of authors – whether including all authors, or only highly-cited authors – in the three identified branches of urban research.

There are two elements that may improve this approach further. The first is to include impact data more directly in the mapping process. The second would be to look at collaboration; here papers are duplicated for each affiliation, and there is no sense of the partnerships that go into that creation; a comparison of the collaborative trends in the various urban research clusters would add even deeper insight into their natures.

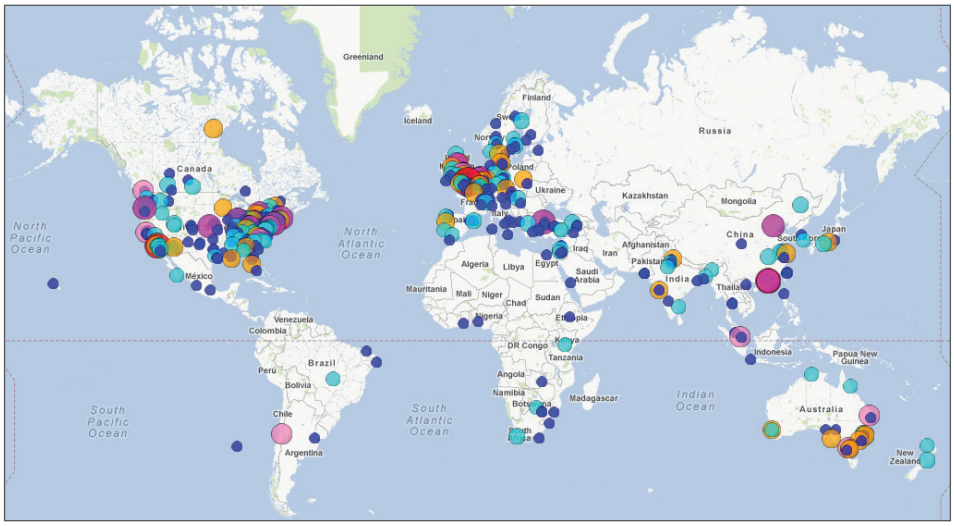

Figure 1 – Distribution of urban studies authors in 2010. Following the method described by Bornmann et al. (3), circles are sized and colored according to the number of papers originating from each location. Data source: Scopus

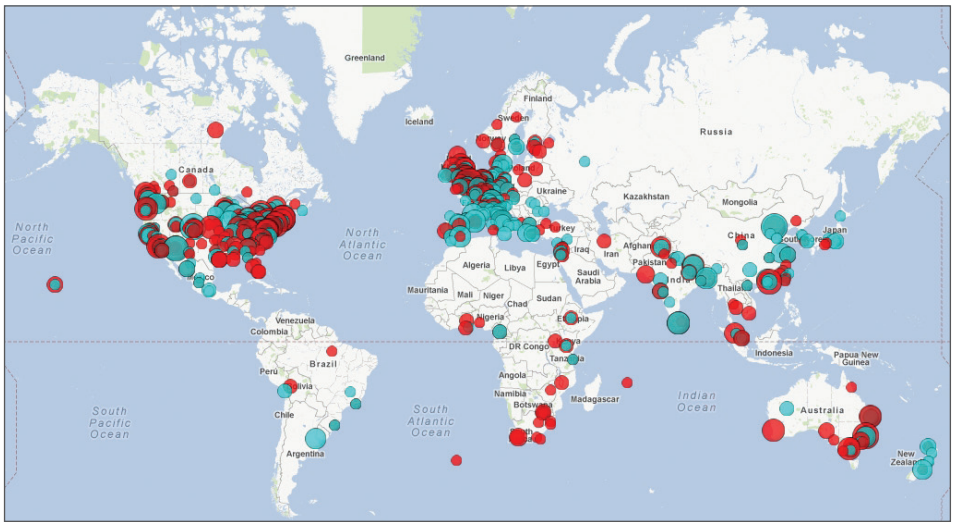

Figure 2 – Distribution of highly-cited Social Science (red) and Science (cyan) urban research authors in 2010. Where authors in the different disciplines are from the same location, this is shown by a darker red or darker cyan than where there is no overlap. Data source: Scopus

References:

1. Kirby, A., & Kamalski, J. (2012) "Bibliometrics and Urban Research", Research Trends, No. 28.

2. Kamalski, J., & Kirby, A. (2012, in press) "Bibliometrics and urban knowledge transfer", Cities; http://dx.doi.org/10.1016/j.cities.2012.06.012.

3. Bornmann, L. et al. (2011) "Mapping excellence in the geography of science: An approach based on Scopus data", Journal of Informetrics, 5(4), 537–546.