

# Developing a European urban health indicator system: results of EURO-URHIS 1

Lesley Patterson<sup>1</sup>, Richard Heller<sup>2</sup>, Jude Robinson<sup>3</sup>, Christopher A. Birt<sup>4</sup>, Erik van Ameijden<sup>5</sup>, Ioan Bocsan<sup>6</sup>, Chris White<sup>7</sup>, Yannis Skalkidis<sup>8</sup>, Vinay Bothra<sup>9</sup>, Ifeoma Onyia<sup>4</sup>, Wolfgang Hellmeier<sup>10</sup>, Heidi Lyshol<sup>11</sup>, Isla Gemmell<sup>1</sup>, Angela Spencer<sup>1</sup>, Jurate Klumbiene<sup>12</sup>, Igor Krampac<sup>13</sup>, Iveta Rajnicova<sup>14</sup>, Alexis Macherianakis<sup>2</sup>, Michael Bourke<sup>1</sup>, Annie Harrison<sup>1</sup>, Arpana Verma<sup>1</sup>

- 1 Manchester Urban Collaboration on Health, Centre for Epidemiology, Institute for Population Health, Manchester Academic Health Science Centre, The University of Manchester, Manchester, M13 9PT, UK
- 2 Evidence for Population Health Unit, Division of Epidemiology and Health Sciences, The University of Manchester, Manchester, M13 9PT, UK
- 3 Sociology, Social Policy and Criminology, University of Liverpool, Liverpool, UK
- 4 Department of Public Health and Policy, University of Liverpool, Liverpool, UK
- 5 Municipal Health Service Utrecht, Netherlands
- 6 The Iuliu Moldovan Institute of Public Health, Romania
- 7 North West Health Brussels Office, Belgium
- 8 Surgical Department, Areteion University Hospital, Greece
- 9 National Health Systems Resource Centre, Ministry of Health and Family Welfare, India
- 10 Institute of Public Health, North Rhine–Westphalia, Germany
- 11 Norwegian Institute of Public Health, Norway
- 12 Institute for Biomedical Research, Lithuania
- 13 Regional Institute of Public Health, Maribor, Slovenia
- 14 SAVEZ—Slovak Public Health Association, Slovakia

**Correspondence:** Arpana Verma, Manchester Urban Collaboration on Health, Centre for Epidemiology, Institute for Population Health, Manchester Academic Health Science Centre, The University of Manchester, Manchester, M13 9PT, UK, Tel: +44 (0)161 275 5206, e-mail: arpana.verma@manchester.ac.uk

**Introduction:** More than half of the world's population now live in cities, including over 70% in Europe. Cities bring opportunities but can be unhealthy places to live. The poorest urban dwellers live in the worst environments and are at the greatest risk of poor health outcomes. EURO-URHIS 1 set out to compile a cross-EU inventory of member states use of measures of urban health in order to support policymakers and improve public health policy. **Methods:** Following a literature review to define terms and find an appropriate model to guide urban health research, EURO-URHIS Urban Areas in all EU member states except Luxembourg, as well as Croatia, Turkey, Macedonia, Iceland and Norway, were defined and selected in collaboration with project partners. Following piloting of the survey tool, a the EURO-URHIS 45 data collection tool was sent out to contacts in all countries with identified EUA's, asking for data on 45 Urban Health Indicators (UHI) and 10 other indicators. **Results:** 60 questionnaires were received from 30 countries, giving information on local health indicator availability, definitions and sources. Telephone interviews were also conducted with 14 respondents about their knowledge of sources of urban health data and barriers or problems experienced when collecting the data. **Discussion:** Most participants had little problem identifying the sources of data, though some found that data was not always routinely recorded and was held by diverse sources or not at local level. Some participants found the data collection instrument to not be user-friendly and with UHI definitions that were sometimes unclear. However, the work has demonstrated that urban health and its measurement is of major relevance and importance for Public Health across Europe. The current study has constructed an initial system of European UHIs to meet the objectives of the project, but has also clearly demonstrated that further development work is required. The importance and value of examining UHIs has been confirmed, and the scene has been set for further studies on this topic.

## Introduction

More than half of the world's population now live in cities, and in Europe, over 70%.<sup>1</sup> Urban areas attract populations because of the economic, cultural and social opportunities they offer,<sup>2</sup> but they can also be unhealthy places to live, with increased levels of pollution, noise and social isolation. Urban dwellers experience increased rates of non-communicable disease, injuries, alcohol and substance abuse, and population density<sup>3</sup> and there may be a lack of green spaces, which, evidence suggests, contribute to mental as well as physical health.<sup>4,5</sup> The poorest sections of urban society are usually exposed to the worst environments and are at the greatest risk of poor health outcomes. The health needs of urban dwellers, and the ability to monitor urban health are therefore a high priority. However, much

of the data about health is collected at regional or national level, with little data on the specific health needs of the urban population.<sup>6,7</sup>

The EU Public Health Programme work plan 2005 identified that the development of an urban health indicator (UHI) system was an essential part of a comprehensive and integrated EU health information and knowledge system. EURO-URHIS 1 (E-U 1), building on earlier EU funded health monitoring projects such as the ISARE I, II and III projects,<sup>8–10</sup> Mégapoles,<sup>11</sup> ECHI<sup>12</sup> and Urban Audit,<sup>13</sup> was designed to contribute to the development of a sustainable urban health information and knowledge system<sup>14</sup> by:

- Helping to identify and prioritize urban health problems.
- Enabling the monitoring of the effects of actions taken to address them.

- Ensuring timely access to information.
- Contributing in building advocacy, communication and education strategies.
- Using standardized methodology for data collection, processing and dissemination, allowing transnational comparisons and time trend analysis.

The objectives of the project were to:

- review and appraise the published literature on the health of urban populations and related indicators and identify relevant data sources;
- summarize individual member states' current use of measures of urban health, in order to compile a cross-EU inventory, which allows transnational comparisons and benchmarking and leads to the development of a health information methodology;
- improve presentation to policymakers of urban health data, in order to enable and facilitate policymaking and increase their impact on public health policy;
- disseminate the project results in order to facilitate the development of a comprehensive urban health information and knowledge system, which could identify and prioritize urban health problems.

## Methods

The project began with five questions which were addressed through a literature review.

- What are health indicators,
- What is an urban area
- What is urban health,
- What are the peculiarities of urban health monitoring
- Which model could guide urban health research.

Important preliminary steps were the identification of the area for investigation and building a network of collaborators to complete the questionnaire in each area. Following a review of definitions of 'urbanicity', it was hoped that The Urban Audit, a project, which collects information on demography, society, the economy, the environment, transport and leisure, in 258 cities across 27 European countries would provide the basis for definition of the metropolitan areas (MAs) that could be the subjects for our study into the availability of urban health data. The basis of Urban Audit's city selection is that it should represent 20% of the countries' population, applying the internationally recognized NUTS 5 (Nomenclature of Territorial Units for Statistics) and LAU2 Level (Local Administrative Units) coding systems. However, this model created anomalies; partners were therefore asked to define MAs using the following three-step approach:

- (1) Identify the 'natural' boundaries of MAs (essentially where countryside ended and residential or commercial areas began).
- (2) Identify local government boundaries, or other official boundaries used for routine data collection purposes, which approximate as closely as possible to the above.
- (3) List the smaller administrative areas contained within the larger MA boundary.

Selected MAs were referred to as EURO-URHIS Urban Areas (EUA) which describe the geographical, administrative or political area in each country where the questionnaire would be applied, and were identified in collaboration with associate and collaborative partners in all EU Member States except Luxembourg, in Candidate EU countries (Croatia, Turkey and Macedonia) and EEA states (Iceland and Norway). The resultant EUAs were given a unique EUA code. The smaller administrative areas contained within the EUA were then assigned a EUA2 Code.

At the initial meeting of the project steering group (12–14 August 2006), it was decided that the project would take the ECHI short list of health indicators, and assess the applicability of the components

of this list for urban health. Following a literature review, an instrument was developed to collect information on member state's current use of measures of urban health. The instrument would be used to assess what urban health data were being collected in urban areas across Europe, and to identify gaps in urban health data.

Following a pilot of the instrument, the number of indicators was reduced from 55 to 45. Twelve health indicators were excluded as not relevant to urban health, two additional indicators were added; and one existing indicator was significantly re-worded. The revised data collection instrument was renamed the EURO-URHIS 45, and the term UHIs used to describe the data collected.

Ten important indicators of health in urban areas could not be matched to existing health indicator definitions that could be applied across Europe. These were included in a 'wish list' as part of the data collection instrument. A summary of all 45 indicators was included as part of the data collection instrument in recognition of the large number of indicators included in the instrument.

The three-part data collection instrument EURO-URHIS was emailed to partners within Europe, who were directed to read the EURO-URHIS 45 summary document first.

## Results

Initial observations of the returned questionnaires illustrated a large variability in the detail included. Where there were large gaps in the dataset, partners were followed up with some success. Despite 60 Questionnaires being returned from 30 countries, only 21 countries returned Part III of the questionnaire, the 'wish list' referred to earlier, which suggested that some partners regarded Part III as less important than the main questionnaire (Part II).

The 45-point Euro-URHIS questionnaire was filled in by 60 European Urban Areas in 30 countries. The number of Urban Areas selected per country varied—from one UA in the countries with the smallest population to four in the most highly populated countries, such as Turkey and the UK. Some UAs chose not to participate at all; a few UAs returned incomplete forms—but the large majority of UAs delivered questionnaires with information about local health indicator availability, definitions and sources.

Table 1 shows which UAs measured UHI by the URHIS definition or a different definition. Table 2 shows how many UAs measured data on specific indicators according to the URHIS definition or a different definition.

In addition to the questionnaire, a piece of qualitative research was designed to elicit from project partners and contacts, information regarding their knowledge of the sources of urban health data required to complete the Euro-URHIS 45, and any barriers and/ or problems they experienced when doing so. Invitations to take part in this research project were emailed in February 2008 to key contacts in 26 EU countries, as well as three candidate EU and two EEA countries with the aim of getting a response from at least one individual in each country. A total 51 individuals were contacted, although they were informed that a single or collective response from their country would be acceptable. The responses can be seen in Table 3. The invitation included a brief outline of the study, the list of questions associated with this study, and details of who to contact for further information. At the end of the emailed list of questions, participants were asked to indicate if they would be willing to be contacted by telephone either to clarify or further discuss particular issues raised by their response. Twenty-three individuals agreed, a sample of 16 individuals were invited by email to participate in a telephone interview and 14 individuals responded to the invitation and were interviewed by telephone. Respondents were also sent a list of the questions at this stage so that they could look at them prior to the telephone interview. Their responses are outlined in the discussion section later.

**Table 1** URHIS definition and a different definition of indicators by urban areas

Country	City	URHIS definition	Different definition
Austria	Graz	24	14
	Vienna	32	13
Belgium	Brussels	34	12
	Liege	30	16
Bulgaria	Plovdiv	20	12
	Ruse	20	12
Croatia	Zagreb	27	10
Cyprus	Nicosia	26	6
Czech Republic	Pardubice	25	8
	Plzen	25	8
	Ostrava	25	8
Denmark	Aalborg	23	6
	Copenhagen	23	6
Estonia	Tallinn	27	16
Finland	Helsinki	15	4
France	Bordeaux	22	6
	Limoges	22	6
	Montpellier	22	6
Germany	Strasbourg	22	6
	Frankfurt	11	7
	Leipzig	15	10
Greece	Munich	14	20
	Athens	32	1
Hungary	Thessaloniki	0	0
	Budapest	21	18
Iceland	Debrecen	22	17
	Reykjavik	12	5
Ireland	Dublin	16	28
Italy	Milano	26	12
	Palermo	22	12
	Rome	24	12
Latvia	Riga	22	11
Lithuania	Kaunas	19	18
Macedonia	Skopje	29	10
Malta	Valetta	29	9
Netherlands	Amsterdam	32	11
	Utrecht	28	11
Norway	Oslo	30	17
Poland	Katowice	13	18
	Krakow	18	19
	Lodz	16	21
Romania	Bistrita	17	4
	Cluj-Napoca	19	5
	Iasi	18	7
Slovakia	Bratislava	35	4
Slovenia	Kosice	35	4
	Maribor	25	8
Spain	Barcelona	15	24
	Madrid	16	25
	Valencia	16	23
Sweden	Gothenburg	17	29
	Helsingborg	15	28
Turkey	Ankara	22	11
	Bursa	22	11
	Istanbul	22	11
	Izmir	22	11
UK	Birmingham	16	21
	Cardiff	26	16
	Glasgow	24	17
	Manchester	12	31

## Discussion

The list of the EURO-URHIS 45 indicators can be seen in Table 2. Generally, individuals responsible for completing the EURO-URHIS 45 questionnaire said they had little problem in identifying the sources of data required. For many this was due to their familiarity with either the indicator or the source of the data through their professional role. Problems in identifying the sources of data

**Table 2** Number of UAs who collect data according to the URHIS definition or a different definition by indicator

Subject of indicator	Number of urban areas where indicator was available by URHIS definition	Number of urban areas where indicator was available by other definition
Population	53	6
Nationality	44	13
Birth rate	56	3
Population projections	30	17
Population density	58	1
Migration nat.	27	23
Migration EU	20	20
Migration non-EU	20	23
Household	26	25
Education	37	17
Unemployment	24	27
Poverty	38	10
Homeless	1	19
Life expectancy	53	4
Infant mortality	54	4
Perinatal mortality	38	1
Birth weight	50	3
Mother's age	44	13
Causes of death	47	10
Chronic illness	16	23
HIV/AIDS	49	3
Lung cancer	41	4
Breast cancer	45	0
Diabetes	34	14
Asthma	18	25
COPD	15	23
General health	39	8
Depression	3	16
Psychological distress	10	20
Limited activity	16	23
Traffic injuries	10	44
Work injuries	20	24
Smokers	26	26
Alcohol	14	34
Cannabis	21	14
Breastfeeding	5	34
Fruit/vegetables	4	28
BMI	38	8
Green space	24	5
PM10	19	16
Noise	6	11
Damp housing	7	8
Vaccination	30	24
Breast screening	6	31
Cervix screening	10	18
Insurance	33	17
Programmes (health education)	27	2

required occurred where the UHI was not included in official statistics. In some countries (e.g. Latvia, Germany, Malta and Romania) UHIs were either not available, or it was not clear whether they were available, as this information was not routinely recorded. The size of country also affected the data available with small countries collecting less data (e.g. Malta). Elsewhere, the definition of the UHI provided was not consistent with the data collected in that country (e.g. Norway and Slovenia) and thus the type of data collected on that indicator differed.

Some data relating to UHIs was held by numerous (up to 20) diverse sources outside the individual's organization. This was time consuming for respondents requiring liaison in order to obtain the information required. Where there were multiple sources of data for one UHI it also raised the question of which source was more

**Table 3** Numbers of EU, candidate EU and EEA countries invited to participate in qualitative research and responses received

	Number of EU countries	Number of candidate EU countries	Number of EEA countries
Key contacts data base	26	3	2
Responses received from email questionnaire	21	2	2
Response as a % of original sample	81%	67%	100%

accurate. Some of the data held was based on estimates from populations and not deemed entirely accurate by respondents. Some sources only collected data for internal use and the data was not routinely available to organizations outside the institution.

Many respondents pointed out the difference between identifying available sources of data and obtaining this data, which was not a requirement of the EURO-URHIS 45. Whilst for many respondents, data extraction posed no problems, others reported possible barriers. For example, UHIs that were only available from a national data source may require disaggregation to reflect smaller areas, or data may require further working to be in the required format for collection and/or comparison. Some countries (e.g. UK, Ireland, Austria, Turkey, Slovakia and France), reported that the possibility of cost implications involved in obtaining data in the format required. Finally, the issue of privacy arose in the case of reporting some health indicators, such as HIV, (e.g. Germany and Belgium), where small numbers of cases in the defined area meant that individuals might be identifiable. This issue was explored further with respondents during telephone interviews.

Some respondents specified particular periods which would facilitate better data, such as February–April, when many governmental institutions publish report and recent data is available or the last quarter of the year, October to December when data from previous year would be available for extraction. Prior warning of the questionnaire would aid data collection, as this could be planned for within institutions. Some felt that a month was inadequate for the collection and collation of the information required and that the research design should accommodate slippage in the timetable, enabling the data collection period to be adjusted accordingly.

Most respondents were able to access the information required to complete the EURO-URHIS questionnaire by utilizing both their own familiarity with or professional knowledge of appropriate data sources. However, the need to include indicators outside their field, necessitated contact with external institutions, predominantly other statutory or governmental agencies, but also non-statutory or private institutions. This was achieved by formal and informal networks. For some respondents these were synonymous due to the good working relationships established over time through ongoing partnership work with these agencies.

The internet was also mentioned by many respondents as a means of accessing data not available through their own institution, in particular data that was already in the public domain as a result of being published by institutions.

The format of the data collection instrument was cited as problematic by some respondents. Respondents felt that supplying the form, for example, as a word or web based document, and being able to split the form into separate subsections or questions, would address these issues.

Respondents commented that some UHI definitions were not clear enough. The representativeness of the indicators selected was also questioned by some who were unclear of what conclusions could be drawn from international comparison of these datasets. Some respondents felt there were too many indicators to form a definitive baseline set. In particular, the number of indicators impacted on the length of the form which was felt to be too long. Whilst the inclusion of both health specific and social indicators was

felt to be useful, it was suggested that the questionnaire be split into two parts to reflect the different types of indicators, thus facilitating collection of this data from different institutions.

Despite these problems respondents were enthusiastic about the importance of identifying such datasets, particularly in countries where this had not been attempted previously on this level and therefore served as a resource to the institution.

In countries where the specified urban health area was co-terminus with administrative boundaries no problems were experienced in identifying datasets representing the population within this area. However, where the defined urban area constituted a geography which was not co-terminus with local authority or municipal boundaries, data was not always available at the level of the urban area, but at smaller sub areas such as city, postcode or ward level. Data for some indicators was available at national or regional level as a result of national statistics surveys, although theoretically this data could be extracted and assembled for the urban area.

The problems connected to identifying data for the defined urban area led some of the respondents to question the usefulness (to health policy) of collecting data at this level and to recommend that the urban health area should be identified on an administrative basis, firstly for availability of the appropriate data, and secondly because of the usefulness of data collected for administrators and policymakers.

A limiting factor is that data collection is an interpretative rather than a purely mechanistic process, and that the individuals completing the questionnaires brought their own experiences, contacts, and professional world view into play when they undertook to provide the data requested by the EURO-URHIS research team. Prior knowledge and expertise, social and professional contacts, competence in written English, and personal ingenuity all seem to have played a part in the interpretation of questions, the identification of sources, and the method of recording these responses. However, while such factors cannot be eliminated, they can be identified and understood to enable future research to minimize their impact on data collection.

The EURO-URHIS project was set up to explore the availability of existing health indicators relating to urban health across Europe, and to assess the feasibility of collecting any available data in the future. This study of the process of urban health data collection highlights a number of issues involved with the identification of data sources, many of which were common across European countries and are therefore likely to relate to other research on comparable topics. Key learning points for future research relate to the format of the data collection instrument; the difficulty of identifying sources of data across health and social care boundaries and of accessing data from non-governmental sources; the timing of the research; the use of existing health indicators in the questionnaire; and the definition of urban areas.

However, what is notable from this additional research is that despite the existence of these barriers, data collection was completed for many of the indicators. Furthermore, the participants were able to use the open comment sections, included in the EURO-URHIS questionnaire for this specific purpose, to clarify their concerns about the data they had included, and so alert the project team to potential issues with the data provided. Therefore,

the project has succeeded in identifying both the utility of using some UHIs and the availability of data and has gained an enhanced knowledge of how urban health data are used and routinely collected across Europe.

## Funding

This research project was co-funded by EU Commission, under the Community Action in the Field of Public Health (HD2005/3.3.1/2003-2008) as part of the EURO-URHIS project (grant agreement no 205119) and the project beneficiaries. We are grateful for the help provided by the EURO-URHIS project teams in each of the beneficiaries' institutions. (Full details of all project partners can be found on <http://urhis.eu/euro-urhis1/>).

*Conflicts of interest:* None declared.

## References

- World Urbanization Prospects: The 2014 Revision, Highlights United Nations, Department of Economic and Social Affairs, Population Division, 2014. Available at: <http://esa.un.org/unpd/wup/Highlights/WUP2014-Highlights.pdf>. (6 November 2014, date last accessed).
- Urbanization: A Majority in Cities. New York: UNFPA, 2007. Available at: <http://www.unfpa.org/pds/urbanization.htm>. (updated 2007; cited 2014; 5 November 2014, date last accessed).
- Urban Health. Copenhagen: WHO Europe, 2014. Available at: <http://www.euro.who.int/en/health-topics/environment-and-health/urban-health/urban-health>. (5 November 2014, date last accessed).
- Lee ACK, Maheswaran R. The health benefits of urban green spaces: a review of the evidence. *J Public Health* 2011;33:212–22.
- Abraham A, Sommerhalder K, Abel T. Landscape and well-being: a scoping study on the health-promoting impact of outdoor environments. *Int J Public Health* 2010;55:59–69.
- Rodwin VG, Gusmano MK. The World Cities Project: rationale, organization, and design for comparison of megacity health systems. *J Urban Health* 2002;79:445–63.
- Riva M, Curtis S, Gauvin L, Fagg J. Unravelling the extent of inequalities in health across urban and rural areas: evidence from a national sample in England. *Soc Sci Med* 2009;68:654–63.
- Project I. Health Indicators in the European Regions: ISARE Project No. 1998/IND/1006 Final Report. Paris: FNORS, 2001.
- Project I. Health Indicators in the European Regions: ISARE Project No. 2001/IND/2101 Final Report. Paris: FNORS, 2004.
- Project I. Health Indicators in the European Regions: Project ISARE 3 Final Report. Paris: FNORS, 2007.
- Mégapoles P. *Project Mégapoles: A Network for Public Health within the Capital Cities/Regions Health Indicators Project. Health in Europe's Capitals: Similarities and Differences*. London: Directorate of Public Health, East London & The City Health Authority, 1999.
- European Core Health Indicators (ECHI). Brussels: European Commission, 2014. Available at: [http://ec.europa.eu/health/indicators/echi/index\\_en.htm](http://ec.europa.eu/health/indicators/echi/index_en.htm). (6 November 2014, date last accessed).
- Eurostat. City Statistics—Urban Audit. Brussels: European Commission, 2014. Available at: [http://epp.eurostat.ec.europa.eu/portal/page/portal/region\\_cities/city\\_urban](http://epp.eurostat.ec.europa.eu/portal/page/portal/region_cities/city_urban). (cited 2014; 6 November 2014, date last accessed).
- Heller R. European System of Urban Health Indicators Europe. University of Manchester, 2006.