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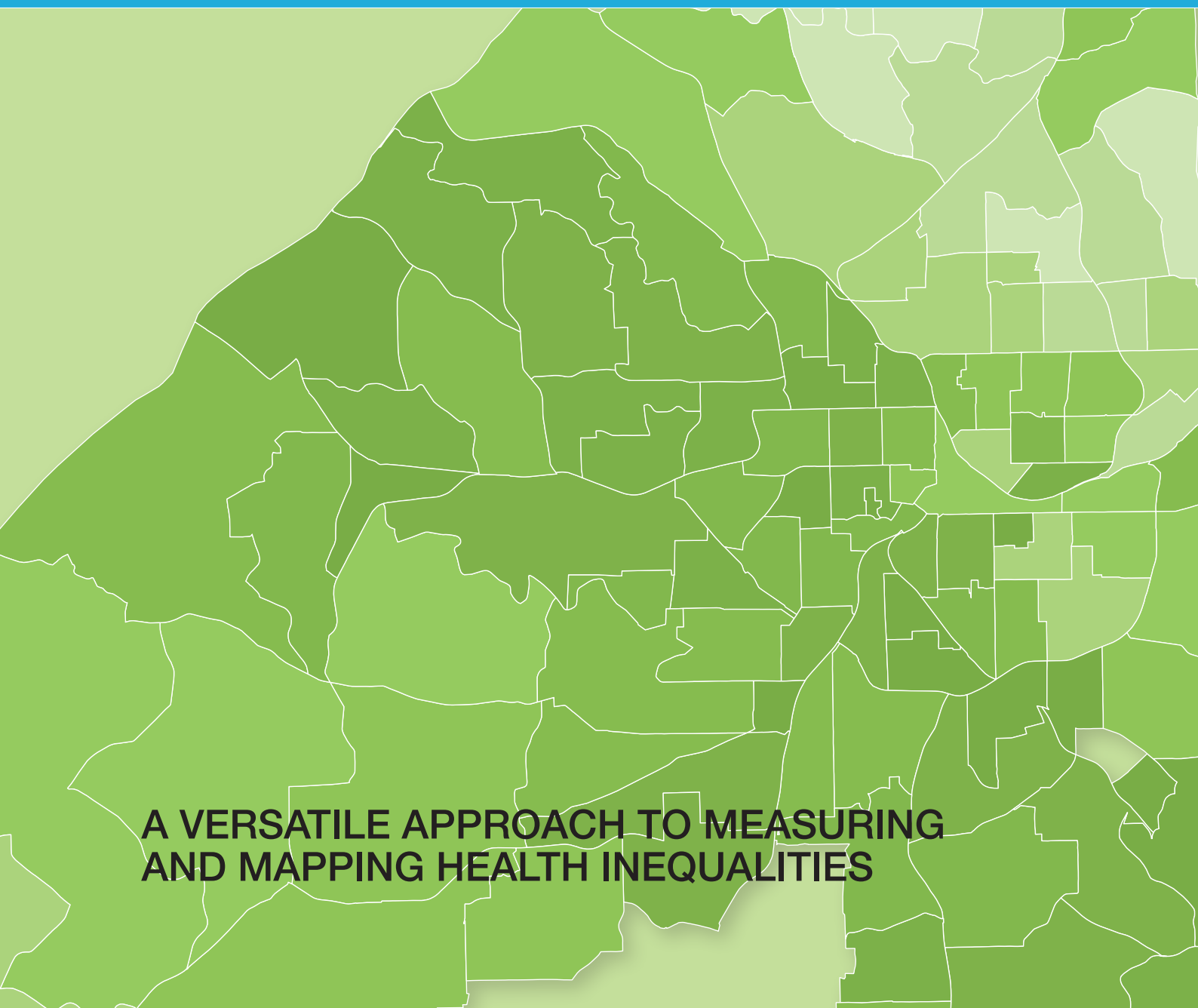
THE URBAN HEALTH INDEX

A HANDBOOK FOR ITS CALCULATION AND USE



A VERSATILE APPROACH TO MEASURING AND MAPPING HEALTH INEQUALITIES

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This handbook was written and developed by Scott R. Weaver, Dajun Dai, Christine Stauber, Ruiyan Luo, and Richard Rothenberg of Georgia State University (GSU) in Atlanta, Georgia, United States of America. It is a product of collaboration since 2010 between the GSU research team based in the School of Public Health, and the World Health Organization Centre for Health Development, or WHO Kobe Centre (WKC), to develop the Urban Health Index. It also reflects inputs from a broad group of experts over the course of this collaboration from both within the two collaborating institutions and beyond.

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INTRODUCTION TO THE URBAN HEALTH INDEX AND THIS HANDBOOK

The Urban Health Index (UHI) is a single metric that can be used to measure and map the disparities in health determinants and outcomes in urban areas. This Handbook is primarily intended for those who want to calculate the UHI for a particular geographic area of interest.

What is the Urban Health Index?

The UHI provides a flexible approach to selection, amalgamation, and presentation of health data. Its purpose is to furnish visual, graphical, and statistical insight into various health indicators and health determinants within particular geographic boundaries and health disparities with a focus on capturing intra-urban health disparities. The UHI may be used by public health workers, evaluators, statisticians, program managers, academic researchers, and decision makers to examine the current status of urban areas, to assess change and the effect of program interventions, and to plan for urban improvements.

The UHI was developed through a set of papers and consultations commissioned by the World Health Organization Centre for Health Development (WHO Kobe Centre). The original motivating question was whether or not a single urban metric was feasible and could capture critical information about an urban area. The decision from these discussions was that a single metric—by default a composite statistic—would not serve the many purposes demanded of it, and a multipurpose tool was likely to be more advantageous. The WHO Kobe Centre and its consultants envision a method that could be applied to health indicators and health determinants, would have built-in measures for disparities, and would lend itself to geographic visualization.

The tool that emerged was not predicated on new methods, but rather built on a methodology that has been under development for many years. A review of extant indicator databases and current approaches to the formation of indices revealed diversity in terminology but considerable concordance in the types of indicators used.[1] Numerous indices have been proposed, most predicated on the inclusion of specific indicators, and many employing arbitrary weighting schemes. The UHI described here builds on the considerable correlation among indicators of the same type (for example, total mortality and its subsets), and eschews weighting in favor of different indicator combinations.[2] The method for the UHI construction has drawn on the approach used by the Human Development Index (HDI)[3] that standardizes indicators by converting them to a proportion of their range, and combines them using the geometric mean. The UHIs for contiguous areas are rank ordered. A *disparity ratio* is calculated from the extremes of the distribution, and a *disparity slope* is calculated by the angle of increase. UHIs for contiguous areas are mapped to provide an immediate visual grasp of the extent and distribution of disparities.

1 Rothenberg R, Stauber C, Weaver SR, Dai D, Prasad A, Kano M. Review and commentary: urban health indicators and indices – current status. Unpublished work.

2 Rothenberg R, Weaver SR, Dai D, Stauber C, Prasad A, Kano M. A flexible Urban Health Index of small area disparities. J Urban Health. 2014. doi:10.1007/s11524-014-9867-6.

3 United Nations Development Programme (UNDP). Human Development Report 2011. Sustainability and equity: A better future for all. New York: Palgrave Macmillan; 2011 (http://hdr.undp.org/sites/default/files/reports/271/hdr_2011_en_complete.pdf, accessed 11 September 2014).

This approach permits freedom to choose the scale (from small area estimates to national comparisons), the indicators (largely dependent on data availability), and the mode of presentation. The following chapters outline the method in detail, provide examples of prior and potential use, and furnish resources for further development and applications. Building on existing work provides connections to the considerable ongoing efforts in this field, and offers pathways to evaluation and innovation in a specific geographic locale.

Who should read this handbook?

This handbook is written for a diverse audience. Its primary target audiences are the public health workers and policy analysts who require a method for quantifying urban health disparities and then presenting such information to policy planners and decision makers. However, research and academic communities may also have an interest. In its Appendices, the handbook offers a rigorous approach to the statistical aspects and visualization of the UHI. Finally, the UHI may prove to be a cogent tool for the media to reach a lay audience concerned with health inequalities.

How is this handbook organized?

The sections of this handbook are organized to guide the reader through the step-by-step calculation of the UHI, from choosing health indicators and determinants to communicating with decision makers and others about the index. Throughout the handbook, actual applications of the UHI in Atlanta (USA), Tokyo (Japan), Shanghai (China), and Rio de Janeiro (Brazil) are provided as illustrative examples.

We begin with a brief Overview of the process for constructing a UHI. Initial considerations involved in this construction are described in the next section, Selecting Indicators for the Urban Health Index. This section also provides guidance for selecting and gathering data for valid and reliable measures of selected indicators and determinants at the desired level of measurement or unit of analysis. Next, the primary steps of calculating the UHI values for an urban area of interest are described and illustrated. This section includes: (1) the preparation and examination of the selected indicator and determinant variables; (2) the use of statistical or spreadsheet software programs to standardize, then aggregate the indicators into the UHI; and (3) the plotting and statistical summation of UHI values for capturing the extent of health disparities within an urban area or among urban areas.

Next, we describe the geographic information systems (GIS) tools for mapping and analyzing the UHI. These GIS tools complement and greatly expand upon the more simplified tools described in the previous section. The UHI and the graphs and statistics computed from it can be used by policy makers and