Big Data for Local Decision-Making: Indicators Identified at International Conference on Urban Health 2017

Authors : Dana R. Thomson, Catherine Linard, Sabine Vanhuysse, Jessica E. Steele, Michal Shimoni, Jose Siri, Waleska Caiaffa, Megumi Rosenberg, Eleonore Wolff, Tais Grippa, Stefanos Georganos, Helen Elsey

Abstract : The Sustainable Development Goals (SDGs) and Urban Health Equity Assessment and Response Tool (Urban HEART) identify dozens of key indicators to help local decision-makers prioritize and track inequalities in health outcomes. However, presentations and discussions at the International Conference on Urban Health (ICUH) 2017 suggested that additional indicators are needed to make decisions and policies. A local decision-maker may realize that malaria or road accidents are a top priority. However, s/he needs additional health determinant indicators, for example about standing water or traffic, to address the priority and reduce inequalities. Health determinants reflect the physical and social environments that influence health outcomes often at community- and societal-levels and include such indicators as access to quality health facilities, access to safe parks, traffic density, location of slum areas, air pollution, social exclusion, and social networks. Indicator identification and disaggregation are necessarily constrained by available datasets – typically collected about households and individuals in surveys, censuses, and administrative records. Continued advancements in earth observation, data storage, computing and mobile technologies mean that new sources of health determinants indicators derived from 'big data' are becoming available at fine geographic scale. Big data includes high-resolution satellite imagery and aggregated, anonymized mobile phone data. While big data are themselves not representative of the population (e.g., satellite images depict the physical environment), they can provide information about population density, wealth, mobility, and social environments with tremendous detail and accuracy when combined with population-representative survey, census, administrative and health system data. The aim of this paper is to (1) flag to data scientists important indicators needed by health decision-makers at the city and sub-city scale - ideally free and publicly available, and (2) summarize for local decision-makers new datasets that can be generated from big data, with layperson descriptions of difficulties in generating them. We include SDGs and Urban HEART indicators, as well as indicators mentioned by decision-makers attending ICUH 2017.