

Analysis finds less research attention given to diseases of the poor

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University of Chicago researchers led an analysis of nearly 4 million scientific articles, which found that research is disproportionately focused on diseases that primarily afflict wealthy countries. Credit: Alison Bird/ US Agency for International Development

Death is not distributed equally around the world. In high-income countries, people typically die in old age of chronic diseases such as cancer or cardiovascular problems. In low-income countries, death comes primarily from infectious and perinatal diseases, and strikes at a

young age.

But despite massive international efforts to improve global health, a new analysis of nearly 4 million scientific articles finds that research is disproportionately focused on diseases that primarily afflict wealthy countries. Correspondingly, less research attention is given to diseases of the developing world, increasing global health disparities, concludes the study, published in *PLoS ONE*.

"Our study demonstrates that health research follows the market, but likely not just because of the market," said lead author James Evans, associate professor of sociology at the University of Chicago, director of the Knowledge Lab and senior fellow of the Computation Institute.

"Health researchers are sensitive to problems they are treating, to problems around them, to Grandma's problems. Countries want to fund research that burdens their populations. Where this leads to inequality in health knowledge is that the disease burden of rich and poor countries are different, and that rich countries obviously produce much, much more research."

To conduct this analysis, Evans and co-authors Jae-Mahn Shim of the University of Seoul and John P. A. Ioannidis of Stanford University drew upon data from the World Health Organization and MEDLINE, the National Library of Medicine's database of biomedical journal articles. The researchers measured the global disease burden—the number of healthy life years lost to disease or disability—of 111 medical conditions, and statistically measured the relationship between each disease's burden and the number of research articles that studied the disease.

Though they expected to find at least a weak influence of disease burden on research, their analysis found no relationship between the two factors. In fact, for certain types of research such as animal studies and

randomized controlled trials, a higher global need was correlated with less research.

For comparison, the researchers calculated the global "market" for treatment of each disease by multiplying the local disease burden for each country by the wealth of that country. Unlike disease burden alone, the global market for treatment showed a strong relationship with research: For every \$10 billion in wealth lost to a disease, the number of [research articles](#) on that condition rose by 3 to 5 percent.

Within countries, researchers found that the relationship between disease burden and research attention was tighter. For each 10 million years lost to a particular disease in a given country, the amount of research within that country on that [disease](#) rose by nearly 75 percent. But because the majority of the world's biomedical research is concentrated in the developed world, most of that effect went towards research on [chronic diseases](#) that cause more death in [high-income countries](#).

The researchers conclude that the world's poor are in "double jeopardy"—experiencing the highest health burden from diseases that are studied the least.

To close this gap, the authors suggest a new strategy for international health efforts. In addition to the current mission of spreading the medical advances and technology of the developed world to lower-income areas, the authors suggest that greater investment should be made to boost scientific research within poorer countries. More distributed research would increase the amount of studies on underserved diseases such as malaria, tetanus, and vitamin deficiencies, and allow scientists to study these diseases in the environment and population where they are most prevalent.

"Often it is said that we know all that we need to know—all that could be

known—about many diseases and health challenges faced in the developing world," Evans said. "But repeatedly biomedical researchers find that this 'knowledge' doesn't always translate into reasonable and effective treatments for patients in resource-constrained environments. In short, we need to know more."

The study is one of the first products of the Metaknowledge Research Network, a multi-institutional collaboration founded in 2012 to study the dynamics that shape human understanding, investigation and certainty. Led by the Knowledge Lab at the Computation Institute—a joint initiative of the University of Chicago and Argonne National Laboratory—the Metaknowledge Network applies Big Data, machine learning and crowd-sourcing approaches and techniques to understand the creation of knowledge and improve the generation of future discoveries. Both Knowledge Lab and the Metaknowledge Network are established through a \$5.2 million grant from the John Templeton Foundation. That funding was obtained with help from UChicago's Arete [research](#) development program.

"Knowledge Lab and the Metaknowledge Network are places committed to understanding more about where knowledge comes from, its limitations and quality and how we can design it to better suit our needs," Evans said.

Provided by University of Chicago

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