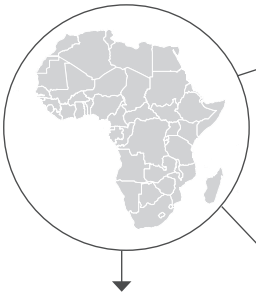
IHME

Precision public health

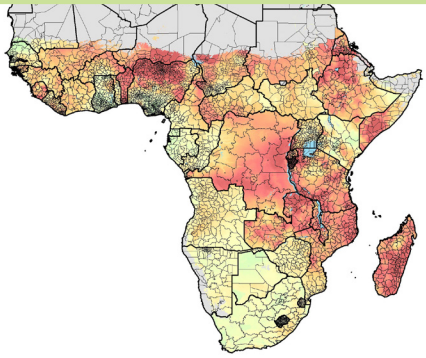
Today, there is an abundance of powerful tools to treat and cure diseases, yet so little information on how to target these tools to maximize health gains. The Institute for Health Metrics and Evaluation's (IHME) Geospatial Analysis team is filling these information gaps by mapping health trends at the 5 km by 5 km level.

Mapping enables



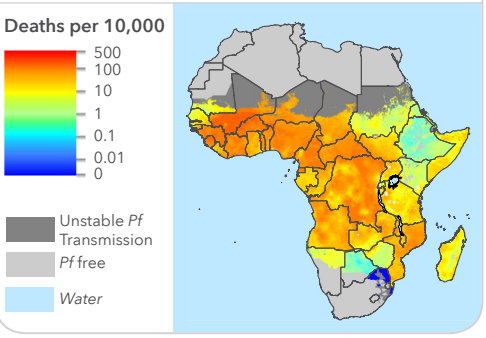
Treatment: Use fine-grained information to provide intervention delivery

Child growth failure, 2015



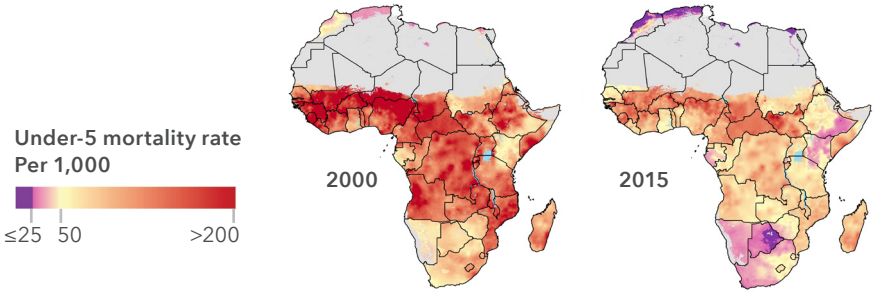
Targeting: Make the best use of limited funding by directing it to areas most in need

Death rates from malaria, children ages 0 to 4 in sub-Saharan Africa, 2015



Tracking: Monitor trends and evaluate progress

Under-5 mortality rates, 2000 and 2015



IHME's geospatial research is the most comprehensive, detailed, and accurate work done in this field to date

With funding from the Bill & Melinda Gates Foundation, IHME's Geospatial Analysis team is revolutionizing the tracking of infectious diseases to help decision-makers make optimal decisions about allocating funds and prioritizing interventions. We are compiling the world's largest dataset on conditions and topics, such as:

- Malaria
- Fever
- Diarrhea
- Lower respiratory infection
- Tuberculosis
- HIV/AIDS
- Death rates for children under 5
- Child growth failure (stunting, wasting, underweight, low birth weight)
- Anemia in women of reproductive age
- Exclusive breast feeding
- Education for women of reproductive age
- Vaccine coverage
- Eradicable neglected tropical diseases (lymphatic filariasis, onchocerciasis, and human African trypanosomiasis)
- Water, sanitation, and hygiene (WaSH)
- Poverty
- Contraception
- Dengue, zika, and other flaviviruses
- Pandemic pathogens (Ebola and other hemorrhagic fevers)

Data sources

To generate these maps, researchers use leading-edge statistical analysis techniques and a wealth of geolocated data, such as:

- Environmental data (including precipitation, temperature, urban/rural status, vegetation, and humidity)
- National surveys with geographic coordinates (such as UNICEF's Multiple Indicator Cluster Surveys [MICS] and the Demographic and Health Surveys [DHS])
- Census information
- Program information on coverage of interventions (such as insecticide-treated bed nets)
- District Health Information Software 2 (DHIS 2) data

Professor Simon Hay speaks with a participant at an Ebola workshop in 2016.

> I found this workshop very useful because the tools will enhance my work in coordination and translating data into information for policymakers who will eventually put resources in priority areas.
>
> – *Dr. Yahya Disu, Medical Officer of Health in Nigeria*

Impact

Strengthening Ebola surveillance

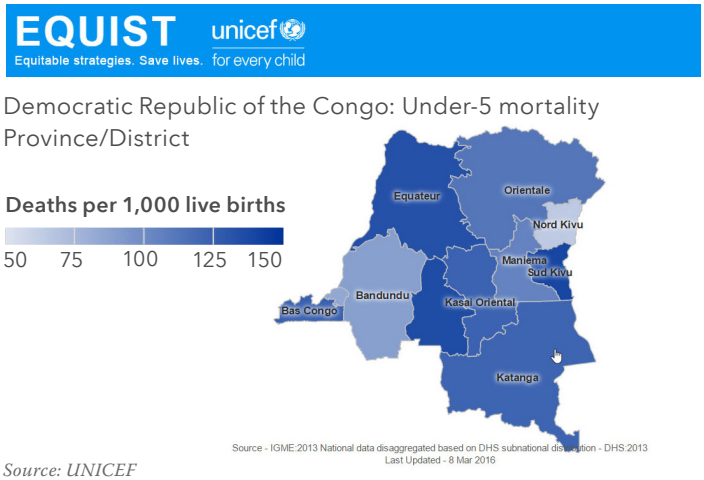
IHME, in partnership with INDEPTH Network, hosted an Ebola workshop in February 2016 in Accra, Ghana, funded by the Paul Allen Family Foundation. This first-ever continental meeting of its kind drew over 60 participants, including veterinarians, epidemiologists, researchers, and medical officers from the 19 countries considered at risk for a potential Ebola index case arising.

Helping governments save kids' lives

UNICEF is incorporating IHME's estimates of child death rates at the 5 km by 5 km level into its EQUIST tool. EQUIST is a tool that less-developed countries can use to improve the health of the poorest mothers and children. EQUIST was designed to help health policymakers and program managers develop better-targeted health plans, improve health systems, and maximize health gains with limited budgets.

IHME and UNICEF are currently working together to incorporate IHME's estimates into the EQUIST tool. To use the EQUIST tool, visit http://www.equist.info/en/dashboard.

UNICEF's EQUIST tool will incorporate IHME's estimates



Source: UNICEF

IHME Geospatial Science leadership

IHME's geospatial science efforts are led by Professor Simon Hay, an Oxford scholar and internationally recognized mapping expert. Much of Dr. Hay's career has been focused on spatial and temporal aspects of infectious disease epidemiology to support the more rational implementation of disease control and intervention strategies. His best-known work is focused on accurately defining human populations at risk of malaria and its burden at global, regional, and national scales. At IHME, with the support of the Bill & Melinda Gates Foundation, Dr. Hay has embarked on an ambitious new project to expand these techniques to a much wider range of diseases and to harmonize this mapping with the Global Burden of Disease.

Prof. Simon Iain Hay
Director of Geospatial Science

To learn more visit **http://www.healthdata.org/geospatial-analysis**