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African scientists contribute in efforts to reduce Africa's high disease burden

The World Bank estimates that Africa's disease burden stands at 25% of the global figure. In efforts to reduce this burden, up to 300 African scientists are converging in Accra, Ghana, this week. They will map out progress of a multi-million, multi-country and multi-year genomic research programme to increase understanding of how human genes and the environment are contributing to Africa's increased susceptibility to disease.

Dr Michelle Skelton, principal investigator, H3Africa Administrative Coordinating Centre based at the University of Cape Town (UCT) commented: "Some diseases are more prevalent and devastating on the African continent than in the rest of the world. Mapping the genetic diversity of Africans by H3Africa researchers will help us to understand why this is the case. Further Africans are also protected against other diseases seen in other continents and it is important to understand this. Health care needs to be targeted, not a one size fits all".

The scientists, members of the Human Heredity and Health in Africa (H3Africa) consortium, have made significant progress in using genetic, clinical and epidemiological tools to identify individuals and populations who are at risk of developing specific diseases.

Findings include:

- Bacteria in the noses of children differ between those who do and do not develop pneumonia, even before pneumonia develops, and that air pollution influences these bacterial communities.
- Hypertension is highly prevalent in eastern and southern Africa and even though many take medication, their hypertension is not always properly controlled.

These and other findings will enable early and more accurate diagnosis, the development of new drugs and potentially personalised medicine which will lead to a modern approach that recognises that individuals respond to treatment differently; and tailors care to a specific individual or population to ensure they get the right treatment and the right dose

at the right time. The data collected will also provide a clearer and more detailed understanding of the genetic diversity of Africans and new insight into the history of human migration in Africa.

Over the past seven years, H3Africa investigators have been examining the relationship between genetic variation, environment, and health in African populations. Genome scale data has been generated for over 50 000 research participants from across the continent.

Genomic research offers the potential to better understand diseases endemic to Africa that remain understudied because human genetics research has been concentrated on European populations, underrepresenting individuals of African ancestry.

The programme has also been very successful in building infrastructure and training a critical mass of highly skilled genomics researchers of close to 800 PhD, master's and Bachelor of Science students in the field.

"With genomics, we can learn more about ourselves—why some diseases are more pervasive and have a more devastating impact in Africa than elsewhere in the world and how African populations respond to treatment — so we can produce products that are relevant to us, including drugs. This will go a long way in aiding efforts to reduce the continent's disease burden and building a foundation for advances in genomics medicine and precision medicine for public health in Africa," said The African Academy of Sciences H3Africa programme manager, Dr Jennifer Mabuka.

Currently, there is an ongoing global effort to apply genomic science and associated technologies to further the understanding of health and disease in different populations. However, most African countries are being left behind in this genomic revolution. H3Africa is part of efforts to urgently close the genomics gap and widening of global and ethnic inequalities in health and economic well-being.

H3Africa is a major genomics research programme established in 2010 by the African Society of Human Genetics, the Wellcome Trust and the National Institutes of Health. The scientists will present their findings at the 14th H3Africa Consortium meeting.

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Note to editors

About H3Africa

H3Africa is a major genomics research programme supporting population-based studies that use genetic, clinical and epidemiological tools to better understand how the interplay between human genes and the environment influence disease susceptibility, pathogenesis and prevention with the goal of improving the health of African populations. The genomic research programme was initiated in 2010 by the US National Institutes of Health, the Wellcome Trust, and African Society of Human Genetics.

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