

# Maximising human health and development through synergistic partnerships: the African Biobank and Longitudinal Epidemiological Ecosystem



Health is pivotal to human development. Nevertheless, progress towards achieving improved health worldwide has been slow, especially in Africa.<sup>1,2</sup> Accelerated progress is only possible with synergistic partnerships, one model of which involves four stakeholders: academia, policy makers, industry, and civil society—the so-called quadruple helix.<sup>3,4</sup> Academia (ie, higher-education institutions and research organisations) provides novel theories and ideas and conducts rigorous research, resulting in new understanding and solutions.<sup>5</sup> Industry (eg, pharmaceutical, medical equipment manufacturing, and information-technology companies) leads entrepreneurship, product development, scaling up solutions, and population-wide commercialisation. Policy makers (ie, governments and multilateral agencies) work to improve, promote, and protect the health and wealth of populations by providing political, legal or legislative, ethical, anthropological, and socioeconomic regulatory frameworks for an egalitarian society, with inclusive and sustainable development for all. Finally, people, populations, and civil societies are the central focus and primary beneficiaries of health and development efforts. They define the problems and solutions, contribute data and samples, and participate in clinical trials.

Africa is the second-most populous continent<sup>6</sup> but has only 2% representation in research efforts and genomic databases worldwide,<sup>7</sup> which reveals the urgent need for a new approach to achieve equitable human development. Research and innovation, through the quadruple helix, are key to producing the vibrant and intelligent human capital needed to develop the health and wealth of Africa.<sup>8</sup> This development will help achieve Africa's aspiration of a "prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the global arena".<sup>9,10</sup>

The African Biobank and Epidemiological Ecosystem (ABLE) is a multidisciplinary, multiregional, and diverse consortium of researchers, research networks, and organisations that was established to fulfil this aspiration. ABLE aims to create a leading health ecosystem with the most inclusive and comprehensive health data

and biospecimen resources in Africa through efficient, effective, transdisciplinary, innovative, One Health scientific research collaborations involving partners across Africa and the globe for discovering, developing, and implementing evidence-based innovative solutions to monitor and overcome health challenges worldwide.

ABLE's steering committee comprises the leaders of several of the teams involved in coordinating activities along the data-value chain and the innovation pipeline. In the short term, ABLE will map and use existing health resources in Africa (eg, biobanks, stakeholders, research networks, and databases), conduct situational analyses and gap analyses of health research in Africa, and, as a result, prioritise and develop the most efficient synergistic strategy to improve health in Africa through research and innovation.

ABLE will strategically use existing resources, such as H3Africa,<sup>10,11</sup> which have been shown to have effects on capacity building, African leadership in discovery science, and community engagement for population-wide effects. Other existing resources include the SickleInAfrica consortium, the African Research Universities Alliance, African Control of Hypertension through Innovative Epidemiology and a Vibrant Ecosystem, the African Stroke Organisation, The African Dementia Consortium, existing biobanks, new national genomics projects in Egypt and Tunisia, and the INDEPTH Network. ABLE will collaborate with the Africa Centres for Diseases Control and Prevention, which has experience establishing transcontinental pathogen and genomics surveillance, and the Data Science for Health Discovery and Innovation in Africa Initiative. ABLE will design cost-effective solutions by engaging with industry partners who are involved in biosecurity, cybersecurity, biobanking, laboratory-information management systems, and omics services. ABLE will promote interaction with policy makers, participants, and end users—including ministries of health, private health-care providers, insurance providers, the WHO Regional Office for Africa, the African Union, the World Economic Forum, technology providers, research

For the **SickleInAfrica consortium** see <https://www.sickleinafrica.org/>

For the **African Research Universities Alliance** see <https://arua.org.za/>

For the **INDEPTH Network** see <http://www.indepth-network.org/>

For the **Data Science for Health Discovery and Innovation in Africa Initiative** see <https://dsi-africa.org/>

fundlers, and philanthropic organisations . ABLÉ will also interact with existing longitudinal population studies and biobanks in Africa and globally.

The diverse, transdisciplinary team of ABLÉ will co-create political, legal or legislative, ethical, anthropological, and socioeconomic frameworks for data and bio-resource collection, ownership, protection, sharing, access, security, intellectual property, and benefit sharing. ABLÉ will build capacity for innovation and drive scientific discovery to enhance understanding of the interacting sociocultural, commercial, economic, biological, genetic, and environmental factors underlying health and wellbeing. This innovation and scientific discovery will be facilitated by artificial intelligence, data science, and precision medicine to accelerate the improvement of health through the creation of an innovation pipeline. Discoveries in African populations are key to understanding the human genome and realising the potential of the genomic revolution.<sup>7</sup> Understanding the genetic and environmental determinants of health will enable ABLÉ to develop, test, and deliver precision solutions and targeted policies through translational and implementation science to accelerate both equitable improvement of human wellbeing and planetary health in Africa and globally.

We declare no competing interests.

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