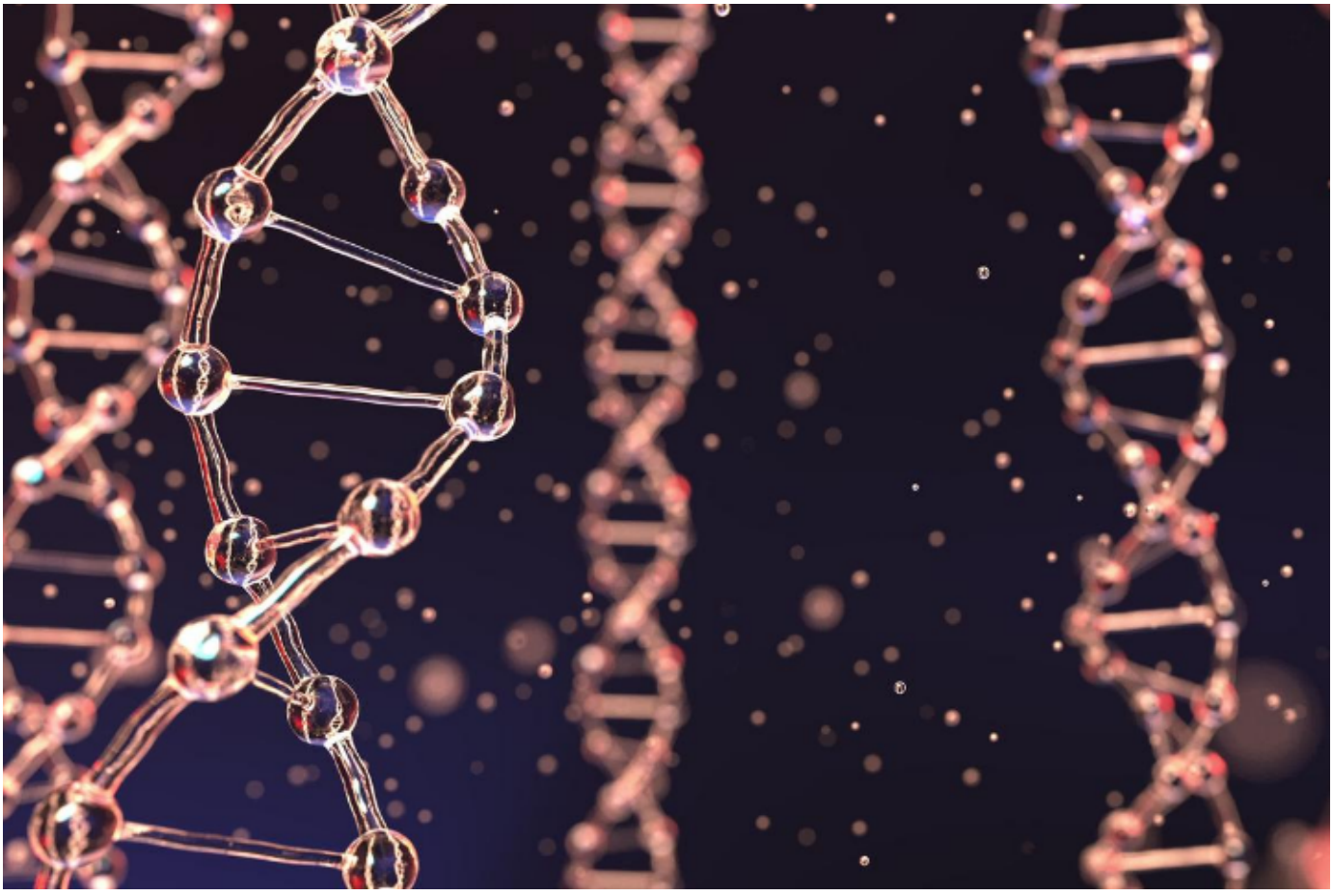
Blog

Genomic medicine in Africa; what will it take?

21 August, 2020	Nicki Tiffin, Nicola Mulder & Jennifer Mabuka	0 Comments



African countries have made progress across a range of issues, but recognizing that time and resources are limited, it is essential to prioritize and focus on the areas that offer the greatest opportunity for impact. A programme coordinated by the African Academy of Sciences (AAS) and the African Union Development Agency (AUDA-NEPAD) seeks to convene the growing number of scientific leaders in Africa and policy makers to review the scientific priorities set by the SDGs, African Union Agenda 2063, STISA 2024 and NDPs, and help build consensus around which top 10-15 scientific priorities that will give African countries the greatest return on investment. Ultimately, the aim is to direct resources towards discovering, developing and delivering game-changing interventions in priority areas that will help most people lead better lives, sooner.

Over a five-year period, the programme will be developing, publishing and disseminating to relevant stakeholders, a set of position papers and briefs communicating the top 10 scientific priorities for Africa. In this blog, Nicki Tiffin an Associate Professor at CIDRI-Africa/Computational Biology Division, University of Cape Town, Nicola Mulder Professor Computational Biology at University of Cape Town and AAS Consultant, Dr Jennifer Mabuka discuss the priority setting exercise for genomic medicine. Read more on the African Science, Technology and Innovation priorities by the AAS and AUDA-NEPAD.

What is genomic medicine?

We have known for many years that a person's genetic makeup might affect which illnesses they have, or how severe their symptoms are. The term "genomic medicine" refers specifically to understanding the contribution of a person's genetic material, all their DNA collectively called their "genome", to their health status, whereas "precision medicine" is used to describe a wide range of approaches to tailor health care to an individual's profile, including their environmental exposures, physical and genetic characteristics. As research has advanced, our understanding of genetics underlying health has expanded sufficiently to be able to contribute to making better diagnoses, choosing more effective treatments, and even prevent diseases from occurring.

Genomic medicine is already being used for several diseases, including testing of babies *in utero* and screening them at birth for known genetic diseases, cancer screening and treatment, and diagnosis of rare diseases. Genomic medicine approaches are also used for infectious diseases to identify strains of pathogens and develop treatment and vaccines. For the current COVID-19 pandemic, genomics approaches are being used to track the spread of the virus and to determine whether there is a genetic basis for why people respond differently to infection. Currently, such activities are mostly restricted to high income countries which have the necessary funding, regulatory environment, clinical and data infrastructure, and can integrate new technologies into clinical practice.

Why do we need genomic medicine in Africa?

Within Africa we have both infectious diseases and noncommunicable diseases contributing to an overall very high burden of disease, which is made worse by socioeconomic factors. The availability of health care varies across African countries, and is commonly affected by shortages of financial, staffing and clinical resources. Genomic medicine can improve patient outcomes by providing better evidence-based health care and can improve efficiencies by ensuring that patients receive accurate and timely diagnoses and the most effective and affordable treatments for their conditions. Reducing 'trial and error' approaches to diagnosis and treatment as well as avoiding adverse reactions to medications can greatly improve the effectiveness of health care.

Until recently, most medical research has been undertaken in northern hemisphere populations, and Africans are under-represented in health genomics research. African populations, however, have a much wider and richer range of genetic diversity because of the ancient origins of modern man in Africa long before their migration to other parts of the world. Environmental challenges over time have also resulted in African-specific adaptations and protection from some illnesses as well as susceptibility to others. This means that we need to undertake research in African populations to ensure that genomic medicine solutions are tailored to African patients. Research findings can also inform precision public health, which aims to more accurately diagnose and treat diseases at a population or sub-population level rather than an individual-level approach. For example, genomic data from a particular population can be used to identify medications that are generally poorly tolerated by individuals in that population, and alternative medicines might be sought as first line treatment.

What is the policy paper titled "A framework for the implementation of genomic medicine for public health in Africa" about?

For Africa to benefit from the genomics revolution there is a need to articulate the opportunities and have a clear 'how to' from research to policy to impact people's lives. A group of scientists from across Africa

have recently completed a policy paper presenting a framework for implementing genomic medicine approaches in Africa. The framework describes key elements that need to be in place in order to effectively harness the benefits of genomic medicine and addresses challenges specific to Africa as well as proposing solutions. Thirty-eight researchers from across the Continent provided input on elements such as patient counselling, screening, treatment and monitoring; sample collection and processing; data-generating and data-archiving infrastructure; genomic medicine research facilities and training programs. The policy paper also reviews the regulatory, data governance and ethics consent processes that are required for all these activities.

Who is the policy paper for?

The policy paper identifies some of the many stakeholders in the implementation of genomic medicine in Africa, whilst recognising the need for comprehensive stakeholder mapping and engagement. These include regional policy makers and governments, as well as their departments of health, finance, science and technology, and education.

The policy paper aims to engage regional, cross-border and pan-African policy-makers such as the African Union, the WHO and the African Academy of Sciences who can promote and advocate for research funding and translational support for Genomic Medicine in Africa, as well as national, African and international funders who can support its implementation. Other stakeholders include healthcare facilities, biomedical service providers and health insurers across Africa as well as the different African population groups and communities.

Genomic Medicine should be used to improve patient outcomes across Africa in an equitable and transparent way, and the primary stakeholders remain African patients and members of the public, in a partnership with clinicians, counsellors, healthcare providers and researchers. This policy paper aims to provide a framework for the key elements to achieve this, and to inform policy and implementation of Genomic Medicine in Africa.

ISSN 2515-9321 | Legal