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1. Background

In 2021 World Health Organization’s (WHO) Director-General, Dr Tedros Adhanom Ghebreyesus, established the WHO Science Council, a group of distinguished scientists from around the world, to work with WHO’s Chief Scientist on priority health issues and to advise WHO on scientific breakthroughs and innovations that can help WHO and its member states to improve global health.

Following their first two years of successful operation, including the publication of the Council’s first formal report on Accelerating access to genomics for global health, and a second report on mRNA Technology for improving global health, WHO convened the Council’s third in-person meeting on 30-31 January 2024 in Geneva, Switzerland. This meeting was an opportunity for the 10-member Science Council to discuss several issues, with their main focus on digital health – looking specifically at health system transformation that can bring major advantages, but also carries potential dangers to current health systems and services.

2. Key discussions

2.1 Exciting areas of science in 2024

Members of the Science Council were asked to suggest current areas of science that they find particularly exciting. The suggestions included: new perceptions of how cancers arise; obesity and undernutrition; gene rejuvenation; neurotechnology; the scope of health-care delivery; digital technology; climate change; diagnosis of genetic disorders; gene editing; ethical issues; new communication technologies; artificial intelligence (AI) for diagnostics;1 and rapid arrival of new developments in medicine.

2.2 Universal health coverage and communicable and noncommunicable diseases

Dr Jérôme Salomon, WHO Assistant Director-General for Universal Health Coverage, Communicable and Noncommunicable Diseases (UNC) presented a science-oriented summary of WHO’s work on communicable diseases and noncommunicable diseases (NCDs). This included the benchmarking of two current malaria vaccines, the development of both a new TB vaccine and a short-course treatment for TB, and development of a vaccine against gonorrhea. The experts also noted WHO’s efforts against antimicrobial resistance, and the development of a global research agenda on diabetes. Additionally, work on reproductive health concerns has shown the need for effective diagnostics for pregnant women. Growing global challenges were discussed, including the health of migrants and displaced peoples, mental health issues, psychotropic drugs, ageing and dementia, and alcohol, drugs, and addictive behaviours. It was highlighted that an important cross-cutting area of work in the coming years would be the issue of biodiversity and climate influence on disease.

Dr Jeremy Farrar introduced members of the Science Council to WHO’s 14th General Programme of Work (GPW-14) which is intended to guide WHO’s work from 2025 to 2028.

2.3 Digital health project – background

A concept note on Responsible global health transition to a digital future prepared by the Secretariat and WHO’s Department of Digital Health and Innovation highlighted that potential positive and negative impacts of digital health are being examined by governments and international and regional bodies as they seek digital means to help achieve universal health coverage. Research on health systems has shown that “digital transformation” depends on a number of “enablers” being in place.

(e.g. policy, governance, human capacity) and the concept note suggested that certain “accelerants” are needed to enable change to happen. Examples were given from areas such as transport, banking and logistics. Interconnected digital technologies were already used effectively in response to the COVID-19 pandemic.

Interest and access to digital health has grown in recent years, while the cost of computing has fallen; however, access and benefits are not ubiquitous. WHO published guidelines in 2019\(^2\) to show countries how digital interventions could improve health services and health outcomes. Then in 2021 WHO issued its *Global strategy on digital health 2020–2025*,\(^3\) stating that digital health is a key input for health systems. More recently, the Organization published an update of its *Classification of digital interventions, services, and applications in health* in order to standardize terminology in this area.\(^4\)

Members of the Science Council were pleased to see the momentum and interest in the domain and with the progress WHO has already made on digital health. They particularly welcomed the focus on empowering women through access to mobile technologies (though stressed the need to ensure that use of the devices and not just access was supported). Mobile phones are a precious resource for displaced peoples and are an excellent means to reach them and try to address their health needs.

2.4 Developing the digital health report

The Science Council agreed to prepare a report on digital health for publication in 2024. The concept paper contained a draft chapter structure which was revised based on the Council’s feedback. While existing WHO recommendations on digital health were considered valuable, Science Council members felt they were too specific and that broader recommendations should be made in the Council’s transformative report. Bottlenecks such as institutional inertia or resistance as a result of existing interests were referred to – but where there is inertia, enablers are needed and examples of these could be included in the report.

Members agreed there was a lot to cover but the main thread would be that, with enablers in place, accelerants can be used to speed up transformation to a digital environment. This has happened in logistics, banking, weather forecasting, global travel and even entertainment and their accelerants could be used as examples. Adoption of telemedicine increased considerably during COVID-19 and in many settings neither bandwidth nor technological restriction were major barriers, however it is worth noting that in many low-resource settings such barriers do still exist and should be a focus for achieving equity in digital solutions. More ubiquitous difficulties arose from situations where doctors were legally allowed to practice only in the regions for which they were licensed, raising the question of interstate or cross-border medical licensing.

It was concluded that digital health – and all that the term implied – was too important an issue for the Science Council not to address. The topic is regularly raised in WHO and in other international health and development bodies. The Council take on this topic because it reflects a situation where there are feasible solutions not currently implementable because of inertia and conflicting interests. The three existing World Health Assembly resolution on digital issues further demonstrates the need


for and importance of this report. The report should clearly include the need for interoperable data, and there must be ways for companies that make the data systems to assist where needed.

While the Science Council can identify gaps and give examples, the ultimate goal must be the worldwide use of interoperable systems. Members suggested that the report could recommend a digital target that all countries should try to reach by a certain date.

Council members will be assigned particular chapters to lead on together with one of six subject matter experts acting as a group of temporary advisors. The Council will be asked to comment on chapters drafted by an expert consultant. It was also proposed to hold high-level expert consultations with a range of specialists, including economists. The private sector may also be asked to give their views but would not be part of the report development process. The target publication date for the report is October 2024.

The report will make clear that digital health is not just about making hospitals more efficient but rather is intended to improve health outcomes for individuals globally. Input would also be required from the WHO regions and potentially from major humanitarian agencies such as USAID, UNICEF, etc. The Chair and vice-Chair will review each chapter to ensure consistency. The various steps in preparation were agreed.

2.5 Update on genomics report implementation

The Secretariat provided an update on progress in WHO’s genomics work following the publication of the Council’s report on Accelerating access to genomics for global health. The Secretariat led genomics work focuses on human genomics, whilst ensuring collaboration with other WHO teams whose work covers other areas of genomics, particularly pathogen genomics surveillance. The HQ team has been engaging with the WHO regions, and currently two regional consultations have been planned for the Americas and the Western Pacific. WHO has been engaging with several external groups including the World Patients Alliance. The Science Council were pleased to learn that private sector engagement is being explored and members emphasized that the private sector is key to accelerating access to genomics technologies as the necessary equipment is expensive and commitments from the private-sector are needed.

As recommended by the Science Council, a Technical Advisory Group on Genomics (TAG-G) has been established and they are working with WHO to accelerate access to genomics. The Chair of the TAG-G, Dr Iscia Lopes-Cendes of Brazil, described the membership and areas of work of the group. Council members noted the need to assist low-income countries in the acceptance and use of genomics. It was recognized that there is increasing collaboration worldwide in the area of genomics. Members of the Science Council requested regular quarterly reporting on the continued activities and achievements of the TAG-G and encouraged consideration beyond human genomics.

2.6 Update on WHO’s work on mRNA technology

Following the publication of its report on mRNA vaccines in December 2023, the Science Council received an update from Dr Martin Fried, Coordinator of WHO’s Initiative for Vaccine Research, on the possible applications of mRNA technology and for ensuring that it can be manufactured worldwide. The update was prefaced by a statement that, while much is possible with mRNA, making an mRNA vaccine is expensive. Nevertheless, 15 countries are in a consortium that is led by the International Vaccine Institute (IVI) in the Republic of Korea and is assessing the viability of mRNA vaccine production. The institutions involved are spread across all six of WHO’s regions. The assessment is looking not only at manufacturing capacity in low- and middle-income countries (LMICs) but at the broader issue of the probability of technical and regulatory success and the
probability of policy development and procurement. As an example, hepatitis B vaccine can be made with mRNA but it is cheap at present so there is no reason to want a new one, whilst COVID-19 vaccine is expensive to manufacture conventionally and can be made cheaper with mRNA.

The range of potential vaccines of importance for different regions was summarized, as was the viability – including economic viability – of producing affordable products using mRNA. Science Council members concluded that mRNA is a promising technology with the potential to ensure wide capacity for pandemic response, but that the sustainability of that capacity depends on the R&D of commercially viable products in different regions. Council members noted that mRNA is likely to work for some vaccines, but its real application will be in therapeutics, and it needs a highly skilled R&D ecosystem, sufficient funds, and a collaborative approach. The Council stressed the need to identify targets in LMICs that mRNA technology could tackle. A vaccine for Rift Valley fever would be an important development but it is unknown whether such a vaccine can be produced with mRNA. The issue of intellectual property was also raised, and the Council noted that mRNA vaccines based on proprietary vaccines will likely lead to companies registering new vaccines as intellectual property in the country where they are produced.

3. Next Steps

It was agreed that there would need to be another plenary meeting before the report on digital health is finalized. A virtual meeting scheduled for 2 April 2024 and the secretariat was requested to draft a schedule for the remainder of the year. Members agreed that there should be one in-person meeting each year. Council members were also reminded that there is a requirement for the Council membership to rotate every few years and 2025 would be a good time to consider this as the Council was formed in 2021.

It was agreed that an event will be organized at The World Summit on the Information Society (WSIS) forum in Geneva in May 2024, to coincide with the World Health Assembly. The event will be an opportunity to gather feedback on the Council’s draft Digital Health report, and some of the Council may be asked to join the event.

The Chair thanked all members of the Science Council for their contributions to the discussions.

4. Participants

WHO Science Council

Harold Varmus, Chair

Lewis Thomas University Professor of Medicine at the Meyer Cancer Center of Weill Cornell Medicine; Senior Associate Member, New York Genome Center, United States of America (USA)

Adeeba Kamarulzaman, Vice Chair (remote)

President & Pro Vice Chancellor of Monash University Malaysia; Past-President, International AIDS Society, Malaysia

Salim Abdool Karim

Director of the Centre for the AIDS Programme of Research in South Africa (CAPRISA), South Africa and Professor of Global Health, Columbia University, USA
Edith Heard
Director General of the European Molecular Biology Laboratory, Germany; Professor, Collège de France, France

Mary-Claire King (remote)
Professor of Genome Sciences and Medicine, University of Washington, USA

Abla Mehio Sibai
Professor of Epidemiology and Dean, Faculty of Health Sciences, American University of Beirut, Lebanon

Cesar G. Victora (remote)
Emeritus Professor of Epidemiology, Federal University of Pelotas, Brazil

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Senior Specialist, National Centre for Genetic Engineering and Biotechnology (BIOTEC), National Science and Technology Development Agency, Thailand

Apologies

Jean William Pape
Director and Founder of Haitian Group for the Study of Kaposi Sarcoma and Opportunistic Infections (GHESKIO), Haiti

Firdausi Qadri
Senior Director of the Infectious Diseases Division at the International Centre for Diarrhoeal Disease Research, Bangladesh

WHO participants

Tedros Adhanom Ghebreyesus
Director General

Jeremy Farrar
Chief Scientist

Jérôme Salomon
Assistant Director-General, Universal Health Coverage, Communicable and Noncommunicable Diseases

Alain Labrique
Director of Digital Health and Innovations

John Reeder
Director of Research for Health
Director of TDR, the Special Programme for Research and Training in Tropical Diseases
**Garrett Mehl Livingston**  
Unit head, Digital Health Technology

**Anna Laura Ross**  
Head, Secretariat for the Science Council  
Unit Head, Emerging Technologies, Research Prioritization, and Support

**Danny Sheath**  
Technical Officer, Secretariat for the Science Council

**Elena Ambrosino**  
Consultant, Genomics

**Ciara Staunton**  
Consultant, Genomics

**Veronique Bruniquel**  
Assistant, Secretariat for the Science Council

**Other:**

**Iscia Lopes-Cendes**  
Chair, WHO Technical Advisory Group on Genomics (TAG-G)

**Rapporteur:**  
*David Bramley*