WHO Consultative Meeting on Science and Technology Foresight Function for Global Health, 13 July 2021

Report
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Executive Summary

On 13 July 2021, WHO held a virtual consultative meeting with 53 participants. Participants were invited to share their views and perspectives to assist WHO in the development of the WHO science and technology foresight function. Following the opening of the meeting by WHO’s Chief Scientist, Dr Soumya Swaminathan, and a briefing by the hosting Research for Health Department, participants discussed and exchanged views in three sessions.

The effort to establish a foresight function was widely welcomed.

The value of networks and networked approaches were highlighted to confront dynamic complexities, uncertainties, and global challenges in concerted and coherent efforts within the organization as well as in partnership with other UN agencies and the wider foresight ecosystem in the private and public sector. Network and collaborative approaches were also highlighted in terms of exploiting synergies and lower high resource demands.

Engagement with a variety of stakeholders was discussed as a critical feature to increase rigour, global perspectives, representativeness, and impact on decision making and implementation. However, although participation is necessary it is not sufficient to ensure equity and representation. A critical engagement with assumptions and conceptual framing as well as the mix of appropriate tools and approaches is important.

The engagement of various actors within and across the organization was highlighted as a critical factor to a successful foresight function to co-ordinate a coherent forward-facing posture and strategic planning.
Background

Advances in science and technology (S&T) hold great promise and hope for new and improved ways to address global health and support healthier populations worldwide. Science and technology play an important role in working towards WHO’s 13th General Programme of Work to achieve the triple billion targets.

WHO strives to remain breast of new developments in relevant areas of research, science and technology to proactively identify, anticipate, and shape issues that hold great promise for global health. The Global Health Foresight function was established in the WHO Science Division to carry out this task and to assist member states to engage in futures-thinking and built it into their strategic health planning frameworks.¹ In order to support countries doing so, a particular emphasis is placed on integrating foresight into the work of WHO’s regional and country offices, helping to build health systems today, future proof to the challenges of tomorrow.

The Global Health Foresight function in the Science Division aims to address the following areas:

1. strengthen capabilities for the early identification of trends or advances in science and technology with notable impacts on public health;
2. generate country foresight and scenarios through structured, transparent processes that help identify how these trends might affect health and health systems in countries; and
3. develop strategic options to prepare future health systems to take advantage of opportunities, and proactively confront risks and challenges, and informing global health policy.

WHO’s Science Division is working with various stakeholders, including international and regional organizations, technical experts, and other partnerships. It is important that the foresight function provides timely, useful, and actionable outputs relevant to all levels of the organization, member states, as well as the global community.

As part of the WHO Foresight function, horizon scans are an ongoing and iterative engagement to explore and identify key topics and issues arising from developments in various scientific and technological areas within the next two decades. The Research for Health Department, organized two horizon scanning exercises to identify areas that are likely to have significant implications for public health and so-called dual-use research of concern. Alongside the horizon scans the department is developing a WHO Global Guidance Framework to provide Member States and other stakeholders with measures to promote the responsible use of the life sciences and to protect against the potential risks caused by accidents and misuse.

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Other forms of foresight have been used by WHO to generate recommendations for WHO response and support for countries addressing COVID-19.²

Meeting objectives

This consultative meeting was organized to elicit expert and practitioner’s views and opinions on the role a WHO science and technology foresight function can play, what elements are necessary, and how to ensure that the science and technology foresight function adopts an inclusive and broad perspective involving a wide range of stakeholders and views. The meeting objectives were thus to:

1. Present WHO perspective and activities on foresight,
2. Discuss and exchange on the role and function of foresight within the WHO,
   
   Key questions included: How can foresight shape global health? What can a WHO foresight function uniquely contribute to global health agendas?

3. Identify approaches most useful in shaping emerging technologies relevant to global health,
   
   Key questions included: What are the key elements for a successful foresight function? What outputs are most useful?

4. Gather different perspectives and options to maximise the impact within and beyond the institutional confines of the foresight function.
   
   Key questions included: How can WHO bring in perspectives and values of a wider range of actors, especially those who are normally excluded? How can foresight be integrated coherently on various levels of the organization?

The expected outcomes were the identification of:

1. A set of elements and approaches that drive an effective and sustainable foresight function.
2. An overview of approaches that will enable incorporation of diverse perspectives and stakeholders.
3. An initial set of key principles to maximise impact.
Key points of the meeting

Opening and welcome: WHO perspective and activities

On 13 July 2021, 53 participants attended virtually the WHO consultative meeting on a Science and Technology Foresight Function for Global Health. The participants were drawn from all six WHO regions, with a good gender balance and representing a wide range of perspectives from international organizations, government, academia, and non-governmental organizations.

The meeting was opened by Dr Soumya Swaminathan, WHO Chief Scientist, who welcomed the participants and briefed the meeting on the role of the Science Division, which was established in March 2019. The Science Division aims to support member states in using robust and reliable evidence and provide global leadership in using science, innovation, and research to improve health and health equity. The Science Division also enables WHO to stay ahead of the curve and strengthen the engagement with the wider scientific community. There has been long standing engagement with the scientific community and in terms of monitoring science and technology in the past, notable examples of WHO’s work are: the work of the Global Observatory on Health R&D which brings together information and analysis on trends in funding and health and economic indicators, to identify patterns, gaps and opportunities; the work of the committee on human genome editing that critically engages with ethical and social dimensions of technical possibilities; the recently published multi-year effort on the ethics and governance of artificial intelligence for health; and engagement with normative aspects of science and technology by developing a Global Guidance Framework on the Responsible Use of the Life Sciences. This engagement is critical to WHO’s foresight work because advances in science and technology can be leveraged to create a better future. Dr Swaminathan highlighted that we can choose the direction and the pace with which we want to pursue particular pathways. WHO’s Science Division created the foresight function in order to identify the choices and to harness the power of science and innovation. The foresight function allows the adoption of a proactive, forward-facing position to monitor science and technology and opportunities for global health and integrate the findings and communicate their relevance. Whilst looking ahead it is also necessary to be mindful of potential negative impacts that raise ethical challenges, have unintended consequences, or developments that are prone to mis-use, or potentially used for nefarious purposes.

Participants were invited to share their views and perspectives to assist WHO in the development of the WHO foresight function that is responsive to needs, and inclusive in bringing in voices, especially those that are normally excluded from discussions of innovation.

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3 See annex 1 for the list of participants.
4 Global Observatory on Health R&D, see: https://www.who.int/observatories/global-observatory-on-health-research-and-development
5 WHO Expert Advisory Committee on Developing Global Standards for Governance and Oversight of Human Genome Editing, see: https://www.who.int/groups/expert-advisory-committee-on-developing-global-standards-for-governance-and-oversight-of-human-genome-editing
6 WHO Ethics and governance of artificial intelligence for health, see: https://www.who.int/publications/i/item/9789240029200
7 WHO Ensuring responsible use of life sciences research, see: https://www.who.int/activities/ensuring-responsible-use-of-life-sciences-research
Further, to assist WHO to be proactive and forward facing and to meaningfully connect our foresight work to policy, and to lead the global conversation on health issues and to set the relevant norms and standards.

Participants were then briefed by Anna Laura Ross, Unit Head of the Emerging Technologies, Research Prioritization and Support unit, and John Reeder, Director of the Research for Health Department, on the activities of the Department, which was established 18 months prior to the meeting. Emerging technology is an integral part of the organization’s work, WHO’s 13th Programme of Work states that: "...WHO’s normative guidance will be informed by developments at the frontier of new scientific disciplines such as genomics, epigenetics, gene editing, artificial intelligence, and big data, all of which pose transformational opportunities but also risks to global health...".  

WHO sees foresight as integral to driving research throughout the organization, both across the different departments and vertically through the layers of the organization from country offices, regional offices, to headquarter. The function is embedded in the Research for Health department. The department consists of three core units: the Emerging technologies, Research Prioritization and Support unit; the Health Ethics and Governance Team; and the Evidence to Policy and Impact Team. The department looks at health research in an integrated and interlinked way from looking forward and anticipating emerging science and technology, supporting and prioritizing research by identifying gaps and promoting research according to the biggest unmet needs; placing ethical considerations centrally to aid decision making and provide governance options; to make information and research findings useful and provide leadership on policies in research and helping to get evidence into policy, ensure access and scale up, and use good evidence to drive guidelines and interventions throughout research and innovation.

Monitoring science and technology for global health and developments at the “frontier of new scientific disciplines” presents a wide horizon of applicable research, innovation and technology, including applications of life sciences in prevention, diagnostics, therapeutics, devices, and more. In addition, other technologies also have applications in health that need to be monitored, such as machine learning and artificial intelligence, digital health, advances in materials sciences, and other technological convergences.

There are three key questions driving the WHO science and technology foresight function: What are the most plausible, impactful, and novel issues related to global health over the next two decades; what are the potential risks that arise from these developments; and how do these issues interrelate to determine what we need to be thinking about today to create the best possible future scenarios and guide global health governance accordingly.

A clear understanding within the Research for Health Department is that foresight is not about predicting the future, rather it is about proactively identifying and anticipating emerging areas that can have an impact on global health to inform decision making processes.

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9 Ibid.
Initial activities around the foresight function included two horizon scans conducted by two expert groups on dual-use research of concern and global health, respectively. These resulted in the identification of a series of topics that merit further attention. These will be published shortly.

A WHO guidance document on foresight will be developed addressing the key questions posed above as the meeting objectives: what foresight is, why it is important for WHO and global health, how it can be done, and how can we work with the member states to make the results tangible and applicable.

Discussion and exchange on the WHO foresight function

Following the opening the meeting was divided into three separate but linked sessions on the role and function, the tools and approaches, and the impact and inclusiveness of the WHO foresight function. The sessions were moderated, and each session was opened by two discussants with a set of initial thoughts leading into open discussion. The agenda of the meeting is annexed to this report (annex 2). Contributions are not attributed to particular participants, the opening remarks by invited discussants are briefly summarised followed by a summary of the open plenary discussion as well as comments and suggestions contributed using the chat feature of the virtual meeting.

Session 1: The role and function of foresight in WHO

The first session highlighted that it is critical to understand both, the role and function but also the unique added value from WHO in engaging in this activity and what gaps need to be addressed. Vasee Moorthy outlined four sub-elements already identified and invited the discussants to reflect upon them and add what might have been missed: strengthen capabilities for the early identification of trends or advances; accelerate WHO guidance to member states on the governance and development of emerging technologies; generate country foresight and scenarios on how these trends might affect health systems; formulate strategic options to prepare future health systems to take advantage of opportunities and proactively confront risks and challenges and informing global health policy.

The first discussant, Sundeep Waslekar, drew attention to the political leverage of WHO and encouraged the use of foresight at national and especially on a regional level to promote collaboration between and across regions, as well as the unique position to take a global view and develop capacities.

The work of the WHO Expert Advisory Committee on Developing Global Standards for Governance and Oversight of Human Genome Editing, although not part of the foresight activity, is an example of the systematic approach to prioritize significant and pressing developments. The co-chair of the advisory committee, Margaret Hamburg, highlighted the role of proper oversight of emerging technologies in order to assure responsible stewardship and appropriate use and access for people around the world. Elaborating on the concept of emerging technologies and advances in science with the notion of a dynamic ecosystem with feedback loops and circular processes. Foresight should not just monitor emerging new technologies and applications but also be thinking about unmet public health and healthcare
needs to make sure that the elements of this ecosystem are aligned so that critical needs are addressed and the opportunities in science and technology harnessed. Translating new opportunities in science and technology into policies and programmes and setting the agenda and shaping the R&D process with due consideration of the regulatory and legal landscape should be an important feature of the foresight function.

The discussion opened up with a wide range of interventions, a first very short intervention that reverberated through the rest of the meeting, highlighting that ‘equity’ is key. Several participants highlighted that the focus is often on new and emerging technologies that are only available to a small subset of the global population – an intentional approach to balance is needed. New tools and approaches offer exciting prospects for global health, but also the risk to increase the inequity in health due to the differences in access to new tools.

In addition to addressing unmet needs, the importance of exploring needs that may not yet exist, as well as those that we may not yet be aware of were emphasised, tying into approaches to better understand and make sense of uncertainty and/or complexity.

Further points were raised echoing that socio-economic factors, and the evolution within the health system and health system readiness are important considerations. A focus should thus, according to some interventions, be on cost effectiveness and efficiencies, in particular with a view towards equity and public health systems. More concrete advice was given in relation to the opportunities in establishing collaborations and policy coherence between UN agencies on foresight, including, but not limited to, the UNDP on developmental issues, UNESCO on futures literacy, UNEP and others on planetary issues, and UNRWA on disaster risk reduction.

The point of foresight being distinct from forecasting was highlighted, where foresight is about shaping the future and present-day action to enable that change. In those terms, a parallel and complementary focus on threats, such as covid, was suggested and a risk register would be a useful tool to systematically analyse, identify and prepare for future risks and challenges.

The configuration of the institutional set-up is an important factor to allow the findings from foresight exercises to lead to prioritizations and strategic alignment. A point raised in terms of strategic planning was that certain technological horizons, such as digitalisation and automation, are well known but have not been sufficiently unpacked in terms of impacts on health care systems and wide-ranging effects. A clarification of the various roles and responsibilities within WHO to confront and deal with issues is needed to ensure that the full range of issues are addressed.

Some suggested that the scope of the foresight function requires a system wide perspective. A focus is often placed on new ‘bits’ of technology which are added to the health system, rather than substituting or divesting – transformations in health systems require a systemic approach. For transformation, or change to happen, patterns of habitual behaviours require to be addressed based on the function of the entirety of the system. It was also suggested that although performance measures are an essential first step in assessing and documenting the clinical utility of emerging technologies, it is not sufficient since they are rarely followed up with other assessments of health care value that are critical to stakeholders who use different measures to define value. The limited value assessment in both research and implementation may be due to logistical constraints of research teams to engage bioethicists, policy makers, health care economists, regulators, and individual patient belief systems. A foresight
framework that brings together various stakeholder inputs and perspectives on clinical translation of scientific findings should be part of the consideration.

An important point was raised that there is a desire from countries to utilize strategic foresight, more broadly, with a view towards longer term health systems transformation and reforms.

Session 2: Tools and approaches

The second session was concerned with the tools and approaches to facilitate the foresight function. The opening of the session highlighted that the choice of tools and approaches frames the assessment and the outcomes and are thus inextricably linked to the scope and impact. WHO’s foresight function in the Science Division operates at a global level and differs from country level approaches in some key aspects. Alexandre Caldas provided a brief overview from the perspective of international organizations conducting foresight activities and emphasized four key points with a reminder that there is an urgency of engaging in foresight activities in these challenging times, characterized by complex uncertainties and increasing instabilities around the globe. The first key message was about the definition of the purpose of the function whether it is to gather intelligence about the future, explore the dynamics of change, describe what future may unfold, or to develop an integrated policy and strategic approach for the organization. The different objectives define the outcomes and thus need to be clearly defined. Second, setting the time frames informs the choice of tools and approaches, whether dynamic and short term or year based early warning assessments, or long-term trends and changes over five, ten, twenty, or more, year horizons. Third, the levels of engagement – integration across the organization, but also within and across the UN system where various initiatives are co-ordinating efforts, as well as globally with partners and stakeholders. The engagement with various actors and partners is important to confront the complex nexus between environmental, health, economic issues. The second discussant of this session, Cat Tully, built on the ideas of ecosystems and connecting the decision-making process to ensure impact by institutionalising the foresight function and taking a practical approach much more focussed on the impact on the national level and on frontline workers. A strong connection was made with the work carried out in a number of member states in collaboration with WHO’s Western Pacific Regional Office10 and some key questions were posed: how are capabilities built at the institutional level? How to build a foresight capability that is meaningful for frontline staff? How is foresight connected to the mission of the organization? An emphasis was on the benefits of connecting activities. Various foresight activities undertaken in different parts of the organization need to be linked up and networked to leverage their impact – the network of foresight activities needs to be tended to within the organization as well as linking with activities outside the organization. The information generated and assessments carried out in various activities then need to be taken up in senior level decision making processes by consciously linking them to tangible aspects of risk assessments and investment decisions, including internal review processes, recruitment, and learning and development. The information supplied from foresight activities need to meet demand in the decision-making process to have an impact. In a complex, international

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10 See, for example: WHO WPRO Strategic Dialogue, https://www.who.int/westernpacific/about/how-we-work/programmes/strategic-dialogue/
organization, such as WHO, the activities of headquarter and regional offices need to be focussed to support the work of frontline and programmatic staff to enable them to carry out their work and make their work better. This is can only be achieved through an ongoing process with the involvement at the national and community level – trends are broadly similar, the difference are the interactions with local realities, that’s why broad engagement is important to understand local contexts and implications. Any measure of success in constituting a foresight function should be cognizant of the impact on the ground.

The discussion opened with a reminder of the rich and diverse set of tools, methods, and understandings\(^{11}\) in the area, sometimes called, future studies must match regional and contextual differences, the time frames under consideration, and the objectives. A tool that was highlighted was UNESCO’s Futures Literacy Laboratories, which enables individuals to explore futures of a range of topics using an inclusive approach that supports preparation and planning for probable futures, as well as the skills to better understand and make sense of uncertainty and/or complexity.\(^{12}\) Future literacy, the role of education and need for capacity building was succinctly expressed by one participant that “you can only demand for what you understand and therefore the issue of creating prepared and connected minds is really important. We cannot therefore ignore the need to constantly engage and educate all stakeholders - to build a culture of foresight.”

A number of practical suggestions on methodological considerations were highlighted during the discussion: the choice of time frames has to be balanced, sufficient to get away from everyday thinking, but not too distant to remain relevant to those engaged in the exercise. Science push and demand pull also need to be balanced in a foresight exercise, scientific expertise is critical but should not dominate the demand side consideration of what is most needed in different contexts. Foresight exercises in large organizations often suffer from the perception that they are top down and imposed, creating a demand and involving as many stakeholders as possible at all levels may ensure that results are accepted and implemented more effectively.

However, a key message was to look beyond the tools and methods towards a systems approach and the question of how to embed anticipatory decision making and foresight at the institutional level to drive decision making, resources allocations, and investments. Implicit assumptions need to be addressed, in particular, the notion of what health systems of the future might look like is often dominated by hegemonic one size fits all vision that requires unpacking. There is a responsibility to not re-create images of ourselves in this work. Notions of equity also need to be examined: diversity and inclusion alone do not ensure equity, barriers and incentives need to be scrutinised. Making assumptions held by participants and stakeholders explicit at the outset of a foresight exercise is important. This understanding can show how an organization or health system is conceptualised by different people, and how the understanding may change over time allows stakeholders to become participants in an evolving conversation.

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\(^{11}\) These tools and methods include foresight, originating in the 1980s; signals of future; la prospective; scenario planning; anticipatory approaches; future literacy; causal layered analysis; and others.

\(^{12}\) See, for example: https://en.unesco.org/futuresliteracy/
The question of who is involved in the process was characterised as equally important as what and how the process is structured. There is diversity in how different groups approach and think about issues, flexibility in the design of methodologies is critical to capture not just diverse and divergent perspectives but also reflect them in outputs.\(^\text{13}\) Participants felt that it is important to be clear what the voices will add, and how this will feed into decision making, different groups provide different insights. One example given was that citizens can identify innovation gaps – conditions or symptoms with which they struggle but are not being offered a solution; this is then used to inform horizon scans; and industry engagement is used to identify opportunities to address innovation gaps and needs.

The discussion about flexibility in method designs, scope, and purpose bore out that it is essential to craft an individual WHO approach to foresight, aligned with the mandate, partners, audience, and the resources available.

**Session 3: Impact and inclusion**

The third session was concerned with the ways to ensure that the approaches taken, and methods applied generate tangible impacts, how to maximise the impacts, and how to ensure that stakeholders are involved, all relevant constituents are included and engaged. In opening the third session, Katherine Littler drew out the key aspects of creating a sustainable activity which engages in a timely fashion with issues in the face of exponential technological growth and change – in the shorter, medium, and longer term. How can we do meaningful bottom-up approaches and stakeholder engagement? How do we include a wide range of voices to bring in a range of perspectives and values of stakeholders and actors, including those that may have been excluded from discussions around innovation in the past? How can foresight activities be integrated coherently, connected at the global, regional, and local level and across?

The first discussant, Heide Hackmann, started the discussion by asking why broader stakeholder engagement and processes of co-design and co-production are important? First, there are benefits and impacts on choices, outcomes, and decisions and in the identification of unmet needs. Second, engagement can lead to broader support and socio-political credibility and legitimacy increasing outcomes and impacts of outputs. At a more basic level is the third, the preparation, recovery and inventing of a response to change or crisis requires a capability to adapt. Shaping and promoting desirable futures is a collective and shared responsibility. We are all in it together. The inclusion of voices of citizens, voices of those affected by the decisions taken by others, is linked to the motivation to engage, potential lack of time or perceptions of agency, but also on the other side the feasibility and timing to facilitate meaningful and equitable requires long time frames and resources. Nonetheless, there is additional value derived from engagement processes, in building capacities in future literacy as well as expanding our understanding of expertise. Recognition of the conditions to create meaningful and equitable participation requires advanced two-way processes of co-design and co-production, beyond simple consultation processes. The second discussant, Seema Parkash, focussed on the need and feasibility from the practitioner’s perspective and experience of the Singapore government. There is an inherent tension between what is useful

\(^{13}\) For an example of involving younger voices, see: https://nextgenforesight.org/who-futures/
and good, such as broad stakeholder engagement, and the resource constraints. Large scale public engagement is resource intensive and not a trivial task. Creativity and flexibility in process design can ameliorate some of the difficulty through the use of diverse networks ranging from community groups or agencies, as well as public facing operational units that have day to day interactions, and policy makers to elicit and bring in a wide range of views and perspectives by proxy. Using complimentary outreach and other engagement activities opportunistically and use synergies of having access to communities of practice, for example, when interacting with youth groups or the business sector to trial ideas, concepts, and approaches. A multi layered approach, making use of existing networks, expertise, assessments to leverage impact – by bringing the ‘outside in’ by being consistent and intentional about the networks involved with foresight and futures methodologies, echoing points raised by several others, on tending to networks. Establishing and maintaining a dynamic network of subject matter experts to help separate signal from noise in various technical areas. Conversely, bringing the ‘inside out’, by understanding the assumptions held within the organization and having meaningful conversations that contribute to enrich perspectives, to test assumptions and conceptual approaches, making decision processes more robust. The point on feasibility was underlined with a note on scope – foresight activities can also have a large impact from focussing on smaller, narrower issues and regular projects, with the option of building on them at a later stage.

A rich discussion ensued that brought in a number of new considerations and reiterated and elaborated on previously mentioned aspects. The importance of networks and interactions internally and externally to amplify work done in different areas and joining up, whether internally for WHO technical teams, ministries of health, and others was mentioned in most interventions. Further to that point, suggestions for collaborations and liaisons with external bodies were made\textsuperscript{14} as a tool to widen impact, gather information, and leverage existing networks including actors in the media. Academic institutions and centres conducting pertinent research, building theory, and training capacities were highlighted as potential partners. Several salient models that address the nexus between anticipation, adoption, and innovation were highlighted.\textsuperscript{15}

More broadly and practically, in the face of resource constraints, suggestions were made to survey and map existing health foresight initiatives at various levels: from micro to macro, local to global; and by various actors including the industrial and private sector. Indeed, resource constraints were illustrated by two specific examples, from government foresight units in Singapore and Canada, that are staffed by ten and twenty staff respectively and the practical realities of engagement, including with those who typically do not or cannot participate or do not trust engagement processes.

Consideration was also given to the conceptual issues that are prominent in other areas: future and unborn generations as well as intergenerational fairness were underlined as prominent issues to anchor and frame discussions on foresight. Whereas in the past interest in foresight

\textsuperscript{14} such as the WHO and World Bank co-convened Global Preparedness Monitoring Board (https://www.gpmb.org/) or the WHO Hub for Pandemic and Epidemic Intelligence (https://www.who.int/initiatives/who-hub-for-pandemic-and-epidemic-intelligence)

\textsuperscript{15} For example: OECD Observatory of Public Sector Innovation (OPSI) Public Sector Innovation Facets model (https://oecd-opsi.org/projects/innovation-facets/).
has waxed and waned, a current broad interest including in various UN agencies, governments, and, for example, the establishment of commissioners for future generations lend efforts that address cost-benefit distributions across current and future generations political capital. Recent and upcoming legal decisions on intergenerational fairness in the environmental discussions further underpin the point.

Capacity building was picked up again in this session as an issue in engagement – capacity to participate meaningfully, and capacity to absorb on the side of decision-making processes.
Key take away and steps forward

There was consensus that the establishment of a WHO foresight function was an important and positive step forward and there was a broad agreement on the usefulness of a WHO foresight function, welcomed by a large number of participants.

Different understandings and conceptualisations of foresight were noticeable. Foresight was spoken about as a process, an exercise, or an embedded institutional framework to varying degrees. Although not mutually exclusive, a clearer understanding of scope and function of the foresight activity in the Science Division, and across the organization is needed, as highlighted by many participants during the discussion.

The scope of a foresight function is a critical consideration, especially with regard to resource constraints. WHO cannot do everything, but it is well placed to leverage efforts.

It was noted that there is a desire and appetite in various countries, and agencies – increasingly matched by corresponding activity, to engage in strategic foresight. This creates an opportunity to bring together, collaborate, network, and leverage disparate efforts by enhancing other efforts with a global public health perspective and bringing in other perspectives that are inextricably linked or dynamically interacting with global health. It was suggested that establishing collaborations and policy coherence between UN agencies on foresight is important to confront complexities and uncertainties, exploit synergies, and increase impact. A complementary focus on risks and threats, such as covid, was suggested to frame assessments and to create a tangible link with decision making processes. A risk register would be a useful tool to systematically analyse, identify and prepare for future risks and challenges.

Global health needs future perspectives. Engagement is critical to rigour. The methodological design must scrutinise the dynamics and interplay between tools, approaches, and engagement, including historically excluded groups, will meaningfully influence decisions. Considerations of intergenerational equity as well as responsive and reflexive models of global health futures incorporating different perspectives was seen as important.

Participation and engagement at various levels is critical for a variety of reasons: to increase credibility and legitimacy, ensure a range of perspectives to make findings more robust and rigorous, facilitate uptake in decision making and implementation, and build capacities in future literacy. However, establishing equitable and meaningful participation and engagement processes is not a trivial task, linked to high resource requirements.

A prominent theme was the need of networks inside and outside the organization, integrating different levels from frontline to global strategy, to engage widely, to gather and check information, to avoid duplication, and foster collaboration, again, within health but also beyond to integrate different issue spaces that impinge on health issues and visa versa.

Foresight is not about predicting but anticipating and shaping different possible futures. There are various opportunities to shape developments at different moments in the research and development and innovation cycle and beyond through capacity building in futures thinking, education, engagement, and empowerment, but also through socio-political interventions with guidance, norm setting, and regulatory and legal approaches.
Understanding what the country needs are and how to engage with stakeholders in a meaningful and equitable way needs to be further explored in the context of WHO foresight.
Annex 1: List of participants

Virtual meeting, Tuesday 13 July 2021, 13.00-15.30 (Geneva time)
Participants in alphabetical order.

2. Caldas, Alexandre. Chief, Big Data Branch, Science Division, United Nations Environment Programme (UNEP)
3. Chrisman, Cara. Deputy Division Chief, Emerging Threats Division, United States Agency for International Development (USAID). United States of America
5. Craig, Dawn. Director, Innovation Observatory, National Institute for Health Research (NIHR). United Kingdom of Great Britain and Northern Ireland
6. Dedouli, Irianna Lianaki. Foresight and Futures Literacy Specialist, United Nations Educational, Scientific and Cultural Organization (UNESCO)
8. Durham, Ben. Chief Director of Bio-Innovation, Department of Science and Innovation. South Africa
15. Karp, Chris. Director, Discovery and Translational Sciences, Bill and Melinda Gates Foundation. United States of America
17. Lin, Vivian. Professor of Practice (Public Health), LKS Faculty of Medicine. Hong Kong SAR, China
18. Makani, Julie. Associate Professor, University of Health and Allied Sciences, Dar-es-Salaam. United Republic of Tanzania
20. Martin, Ben. Professor of Science and Technology Policy Studies, University of Sussex. United Kingdom of Great Britain and Northern Ireland
21. Mojica, Francisco José. Director del Centro de Pensamiento Estratégico y Prospectiva, Universidad Externado de Colombia. Colombia
22. Morel, Carlos. Director, Centre for Technological Development in Health, Fundación Oswaldo Cruz (Fiocruz). Brazil
23. Ochu, Chinwe. Director, Prevention, Programmes & Knowledge Management, Nigerian Centre for Disease Control. Nigeria
27. Suzuki, Ayaka. Director, Strategic Planning and Monitoring Unit, Executive Office of the United Nations Secretary General
28. Tully, Cat. Managing Director, School of International Futures (SOF). United Kingdom of Great Britain and Northern Ireland
29. Ujewe, Samuel. Senior Advisor, Ethics, Canadian Institutes of Health Research (CIHR). Canada
30. Van De Goor, Gianpietro. Policy Assistant to the Director for Health Research and Innovation. European Commission
31. Vargas Lama, Fredy. Principal Investigator, Centro de Pensamiento Estratégico y Prospectiva, Universidad Externado de Colombia, Colombia
32. Waslekar, Sundeep. President of Strategic Foresight Group, Strategic Foresight Group. India

OBSERVERS
34. Magnan, Anne. Senior Policy Advisor, Office of Biosafety Programs and Planning, Public Health Agency of Canada. Canada

WHO
35. Azim, Tasnim. Regional Office for South-East Asia
36. Brandalac, Fanette. Regional Office for the Western Pacific
37. Cawthorne, Amy. Regional Office for the Western Pacific
38. Davtyan, Karapet. Regional Office for Europe
39. Ichmann, Kai. WHO headquarters
40. Keks, Matthew. WHO headquarters
41. Kuchenmüller, Tanja. WHO headquarters
42. Lim, Matthew. WHO headquarters
43. Littler, Katherine. WHO headquarters
44. Loncar, Zorica. WHO headquarters
45. Mathis, Margaux. WHO headquarters
46. Moorthy, Vasee. WHO headquarters
47. Rajatonirina, Soatiana. WHO headquarters
48. Reeder, John. WHO headquarters
49. Ross, Anna Laura. WHO headquarters
50. Shindo, Nahoko. WHO headquarters
51. Siswanto, Siswanto. Regional Office for South-East Asia
52. Swaminathan, Soumya. WHO headquarters
53. Tuerlings, Emmanuelle. WHO headquarters
# Annex 2: Meeting agenda

**WHO Consultative meeting on the development of the WHO Foresight function**

**Virtual Meeting, Tuesday 13 July 2021, 13.00-15.30 (Geneva)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:50-13:00</td>
<td>Connection opens</td>
</tr>
</tbody>
</table>

**Welcome, meeting objectives and the WHO foresight activities (30 mins)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>13:00-13:10</td>
<td>Opening</td>
</tr>
<tr>
<td>13:10-13:20</td>
<td>Welcome address by Dr Soumya Swaminathan, WHO Chief Scientist</td>
</tr>
<tr>
<td>13:20-13:30</td>
<td>WHO Foresight</td>
</tr>
<tr>
<td></td>
<td>- Brief overview of establishment of WHO foresight function</td>
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</table>

**Session 1: The role and function of foresight within the WHO (35mins)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>13.30-14.05</td>
<td>Moderation</td>
</tr>
<tr>
<td></td>
<td>Key questions for this session:</td>
</tr>
<tr>
<td></td>
<td>- How can foresight shape global health?</td>
</tr>
<tr>
<td></td>
<td>- What can a WHO foresight function uniquely contribute to global health agendas?</td>
</tr>
<tr>
<td></td>
<td>First Discussant (2-3 mins)</td>
</tr>
<tr>
<td></td>
<td>Second Discussant (2-3 mins)</td>
</tr>
<tr>
<td></td>
<td>Open Plenary (20 mins)</td>
</tr>
</tbody>
</table>

**Session 2: Approaches to effectively shape emerging technologies relevant to global health (35mins)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>14.05-14.40</td>
<td>Moderation</td>
</tr>
<tr>
<td></td>
<td>Key questions for this session: benefits for health policy development</td>
</tr>
<tr>
<td></td>
<td>- What are the key elements for a successful foresight function?</td>
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<tr>
<td></td>
<td>- What outputs are most useful?</td>
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<tr>
<td></td>
<td>First Discussant (2-3 mins)</td>
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<tr>
<td></td>
<td>Second Discussant (2-3 mins)</td>
</tr>
<tr>
<td></td>
<td>Open Plenary (20 mins)</td>
</tr>
</tbody>
</table>

**Session 3: Options to maximise the impact and stakeholder involvement (35mins)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>14.40-15.15</td>
<td>Moderation</td>
</tr>
<tr>
<td></td>
<td>Key questions for this session: relevance and context dependence</td>
</tr>
<tr>
<td></td>
<td>- How can WHO bring in perspectives and values of a wider range of actors, especially those who are normally excluded?</td>
</tr>
<tr>
<td></td>
<td>- How can foresight be integrated coherently on various levels of the organization?</td>
</tr>
<tr>
<td></td>
<td>First Discussant (2-3 mins)</td>
</tr>
<tr>
<td></td>
<td>Second Discussant (2-3 mins)</td>
</tr>
<tr>
<td></td>
<td>Open Plenary (20 mins)</td>
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</tbody>
</table>

**Conclusion (10mins)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>15:15-15.30</td>
<td>Rejoinder, Next steps and Close</td>
</tr>
<tr>
<td>15:30</td>
<td>Connection closes</td>
</tr>
</tbody>
</table>