SCIENCE 20 COMMUNIQUÉ

G20 INDONESIA 2022

RECOVER TOGETHER

RECOVER STRONGER

Executive Summary

The Science20 (S20) recommends that the G20 governments tackle challenges in the priority issues that cover: building resilient health systems, enhancing adaptive capacity of health systems to climate change, bolstering multi-disciplinary science and technology for pandemic preparedness and climate change, guaranteeing that people are at the center, and strengthening the nexus between data-research-policy-practice for climate change, pandemic preparedness and economic recovery. The S20 recommends the following action measures:

1. WHO should globally coordinate the implementation of the proposed actions, to ensure alignment with relevant global health initiatives.
2. Mitigate health care contributions to greenhouse gases (GHGs) and climate change, while at the same time, improving health care quality and resilience.
3. Improve the path to a more sustainable, resilient and effective health system that should include development of country-driven adaptation actions for strong and equitable health systems aligned with national priorities, and engagement of local and international communities.
4. Leverage technical advancements, in particular information and communication technology (ICT), supported by clean/renewable energy systems adapted to local conditions, including developing preventive medicine, tele-health care and community health literacy to avoid overloading critical health systems and meet consumer needs.
5. Enhance technological development that significantly contribute to achieving sustainable development targets in utilizing renewable energy resources, building urban water systems and sustainable public infrastructure, sustainable management of natural resources, increasing healthy diet from sustainable food production, and producing environmentally-friendly materials and products.
6. Increase the currently minimal financial support for health adaptation, expand multilateral climate finance projects, and develop appropriate financial incentives.
7. Enhance multi-disciplinary collaborative work with more research on pandemic preparedness and climate change among multiple stakeholders for the benefit of the people, the planet, and the prosperity for all parties.
8. Encourage Open Data practices to enhance knowledge collaboration and transfer among G20 members, that should be accompanied by a strong data policy and ethics.
9. Encourage mutual partnership to support climate action, recognize the importance of a just transition to a low-carbon economy enabling a fair and just energy transition for many countries, supported by proper energy policy and financial incentives through market-based approaches.
10. Require the commitment of G20 members to support the science and technology cooperation and expand access across member countries. Sharing financial support, knowledge and technology among G20 members is argued as a mechanism to achieve those commitments, so that no one is left behind.
11. Ensure the sustainability and resilience of our societies and planet, by guaranteeing that all people are at the center, especially people in vulnerable situations in the Global Health Architecture (GHA) and the Digital Economy Transformation (DET).
12. Equalize disparate access and powers, increase efforts to integrate the Social Sciences and Humanities into all public policy decisions affecting people, thereby guaranteeing that people are at the center.
13. Bolster the adoption of evidence-based policy to strengthen political will and leadership and establish institutional design to facilitate the exchange of scientific information for decision makers.
14. Involve all stakeholders including the public and local communities, ensure transparency and access to data availability and translatability, local as well as global, in various forms, including digital, to monitor and evaluate scientific-based policymaking.

The Ways Forward for Tackling Current and Emerging Challenges

1. We note that Climate change and the COVID-19 pandemic are existential threats with complex interacting causes. Both lead to unpredictable and unprecedented consequences. There are parallels between the scale and scope of their impacts and the responses they evoke. Understanding shared drivers, coupled vulnerabilities, and criteria for effective responses, will help societies worldwide to prepare for future threats from climate change and unpredictable pandemics.

2. Despite warnings from the scientific community about the risks of the pandemic, the world has largely remained unprepared for the current crisis, and insufficient action has been taken against climate change. There are plenty of reasons for the multitude in handling the pandemic at a local level. Citizens' resilience and their capacity to withstand and respond to unpredicted crises must be improved, by reforming social protection schemes and policies to be more adaptable, anticipative, and adjustable. This can be done through adaptive social protection and adaptive policy. It is necessary for governments, with strong support from the private sectors, to give the necessary support. In order to increase the motivation of the private sector, public incentives and corporate social responsibility activities can be accelerated. Nevertheless, the political system and ability to deal properly with the pandemic, public policies and decisions are highly dependent on the availability of science-based data analyses.

3. In rebuilding G20 economies after the COVID-19 pandemic, we are required to have the ability and willingness to reconsider the type of global economic activities we need for a sustainable future. A workable and affordable green transition that is attentive to ways of living and practices specific or unique to different local situations is essential to mitigate climate change and alleviate environmental crises. A high-quality partnership for a new era of global development should also be strengthened for stronger, greener and healthier global development. Such systemic recovery can go forward only if policy makers are guided by a clear vision, policy and strategy, involving both the public and private sectors in: boosting productivity; investing in infrastructure; reaching net-zero greenhouse gas emissions; and implementing the Paris Agreement and the 2030 Agenda for Sustainable Development Goals.

4. In the education sector, re-imagining and re-designing to build forward better are essential. The principles in the UNESCO Futures of Education initiative highlight the importance for post COVID-19 recovery. The pandemic has revealed many potential problem areas and opportunity gaps. Governments and communities can improve the education and knowledge base for young generations, from elementary school students to university students, and people from all ages and segments of society. Addressing educational challenges must emphasize multidimensional, interconnected, and holistic approaches.

5. The 2022 G20 Summit promotes the theme of "Recover Together, Recover Stronger", with the intent of developing concrete action plans for green, inclusive, resilient, and sustainable global economic recovery after the COVID-19 pandemic. Three pillars of the G20 summit that are aimed

at achieving the goals to an optimal future for humankind are: Global Health Architecture, Digital Economy Transformation, and Energy Transition.

6. We, the Science20 (S20), recommend that the G20 governments strive toward achieving sustainable and inclusive growth across the world, and to contribute toward enhancing the quality of life. The recommendations related to tackling challenges in the priority issues cover: building resilient health systems, enhancing adaptive capacity of health systems to climate change, bolstering multi-disciplinary science and technology for pandemic preparedness and climate change, guaranteeing that people are at the center, and strengthening the nexus between data-research-policy-practice for climate change, pandemic preparedness and economic recovery.

BUILDING RESILIENT HEALTH SYSTEMS

7. The COVID-19 pandemic has had wide-ranging impacts on all areas of society, leading to setbacks in health gains and efforts to achieve universal health coverage. The diversion of health system resources to address COVID-19 care has led to a disruption of essential health services. New barriers to healthcare access, such as movement restrictions, reduced ability to pay and fear of infection, have posed additional and unprecedented challenges. As the first major pandemic in both the digital information and communication age and the era of molecular medicine, COVID-19 provides major lessons that we must take on board. We need to be proactive on the policy, communications, education and science fronts. Past overreliance on reacting to events as they occur, rather than on prevention and preparedness, has left countries unprepared to timely address a global crisis of this speed and magnitude. Unfortunately, the pandemic has also hit vulnerable populations hardest and further exacerbated pre-existing inequalities. That we can, and must, change if, in our interlinked and interdependent world, humanity is to have a bright future. The COVID-19 experience is a wake-up call that health systems and all essential infrastructures at the global, regional and national levels need to be substantially improved to provide a safety net for imminent existential threats. Obvious challenges are pandemics and climate change. Recovery from the pandemic and preparation for the next provides an opportunity to make changes in health and other systems that help to address problems related to climate change. The health system transformation would be a part of enhancing global preparedness and response that benefits every layer of society. Health, social, education and economic infrastructures are irreversibly intertwined.

8. We, the Science20 (S20), recommend the following action measures with regard to this issue.

9. WHO should globally coordinate the implementation of the proposed actions, to ensure alignment with relevant global health initiatives, such as the ‘One Health’ Joint Plan of Action. Essential institutional arrangements should be promoted, such as: networks of international centers of excellence fostering faster responses for interlinked global crises; increasing the flow and speed of information and data sharing within and among countries; increasing the flow and speed of information and data sharing within and among countries; and increasing response capacity within countries to tackle emerging crises. The health sector can itself do more to mitigate its contributions to greenhouse gases (GHGs) and climate change while, at the same time, improving

health care quality and resilience. Tackling the pandemic and climate change and improving preparedness by producing a suitable strategy which could include:

- A pandemic alert system that provides all research institutions and authorities with immediate access to relevant information, following strict data sharing policy and ethics;
- Facilities for the production of vaccines and drugs on all continents that can be rapidly brought into production in the event of a pandemic;
- Secure supply chains for medicine-relevant materials and production at multiple locations worldwide;
- A well-trained medical workforce, a global education program curriculum for health units and measures for burnout of the medical workforce in response to a pandemic; and
- Expansion of public health monitoring network and utilization of information and communication technology (ICT) to overcome the limitations of epidemiologic investigations.

ENHANCING ADAPTIVE CAPACITY OF HEALTH SYSTEMS TO CLIMATE CHANGE

10. Climate change will increasingly impact human and ecological health and well-being. Changing conditions will expand favorable habitats for vectors of parasites and other pathogens, exacerbate antimicrobial resistance, and increase the risk of zoonosis, making the implementation of the 'One Health' approach even more urgent. They will also cause disruptions in food production and distribution, exacerbating food insecurity and all forms of malnutrition. This will increase health care burden related to communicable and non-communicable diseases, including mental health. Failing to recognize and address this issue will make the recovery more painful and expensive. Therefore, climate change mitigation and adaptation need to be embedded in all pandemic recovery plans, including in the health sector.

11. All populations are vulnerable; however, the impacts tend to be most severe for the poor, who often already suffer from poor sanitation and limited access to safe drinking water, healthy food, energy and transport. Furthermore, few countries currently include weather and climate-informed information in their health in surveillance systems for climate-sensitive diseases or health-related early warning systems.

12. A wide array of technologies can be leveraged to create, expand and monitor the effectiveness of health care and the contribution of the health sector to advancing socially and ecologically sustainable development, including enhancing and ensuring compliance with environmental adaptation and mitigation measures within the health system. In order to realize this potential, there is a need to build greater acceptance of, and capacity for, using information and communications technology (ICT) in healthcare.

13. We, the Science20 (S20), recommend the following action measures.

14. The path to a more sustainable, resilient and effective health system should include development of country-driven adaptation actions for strong and equitable health systems aligned with national priorities, engaging local and international communities. Improving access to sanitation and safe drinking water, healthy diets from sustainable food systems, clean/sustainable

energy, and transport, can substantially reduce poverty and improve health and wellbeing. Measures such as appropriate urban/spatial planning, universal health coverage and social safety nets can further reduce the burden of avoidable disease, thereby enabling health systems to respond to the increased burden of disease related to climate change. Specific ways to enhance the adaptive capacity of health systems include but are not limited to:

- Leverage technical advancements, in particular information and communications technology (ICT), supported by clean/renewable energy systems adapted to local conditions, including to develop preventive medicine, tele-health care and community health literacy to avoid overloading critical health systems and meet consumer needs;
- Improve early warning systems and readiness of health services and medical supply logistics to react to emergency cases, especially in remote areas;
- Increase multi-sectoral/multi-level collaboration on health and climate change policy; and
- Increase the currently minimal financial support for health adaptation, expand multilateral climate finance projects, and develop appropriate financial incentives.

BOLSTERING MULTI-DISCIPLINARY SCIENCE AND TECHNOLOGY FOR PANDEMIC PREPAREDNESS AND CLIMATE CHANGE

15. Preventing, preparing for, and responding to a global health crisis such as pandemics and climate change require multi-sectoral and multi-disciplinary approaches that engage different sectors and actors such as governments, business, and civil society along with researchers and scientific bodies to work together on a common agenda of prevention, adaptation, and mitigation of risks and impact. This necessitates that pandemic and climate risk reduction be an integral part of national health and economic policies to strengthen the resilience of societies at large.

16. Research dependent on multi-disciplinary approaches across spatial and temporal scales is needed to identify effective policy and governance solutions to such complex challenges as pandemics and climate change. However, research funding agencies do not currently allocate sufficient funding for cross-disciplinary and multilateral research initiatives. Institutional fragmentation further exacerbates the effectiveness of various research efforts and makes it more challenging for science to contribute effectively to policy making. To promote sustainable transitions, multi-disciplinary science should embrace inclusivity, equity, co-production, and scientific rigor.

17. Furthermore, partnership and collaborative processes from all stakeholders are required to enhance the acceleration and adoption of technologies for environmental regeneration and quality of life improvement. In this context, policy makers, business practitioners, scientists, researchers and societies should be working together to add sustainable value and reinforce the positive aspects of technology's effect on the environment. As technology changes the way we live, it will continue to have a profound impact on the way we regenerate and protect our environment's sustainability. Therefore, we suggest that technology transfer be conducted among G20 members.

18. We, the Science20 (S20), recommend the following action measures.

19. Enhancing multi-disciplinary collaborative work with multiple stakeholders for the benefit of people, the planet, and prosperity for all parties.

20. Technological development in utilizing renewable energy resources, building urban water systems and sustainable public infrastructure, sustainable management of natural resources, increasing sustainable food production, and producing environmentally-friendly materials and products are among the pathways by which technology policy will significantly contribute to achieving sustainable development targets. Furthermore, as the need for robust scientific research increases, Open Data practices could be encouraged to enhance knowledge collaboration and transfer among G20 members. The adoption of Open Data should be accompanied by a strong data policy and ethics.

21. We strongly suggest that more research on pandemic preparedness and climate change be carried out, for example, research towards energy transition. The energy system is experiencing rapid transitions that are triggered by the latest developments of science and technology, updated regulations, consumer preferences, and the growing global demand for affordable and clean energy. Yet, many countries face different energy challenges in their pursuit of a low-carbon economy. Utilization of renewable energy sources and energy system digitalization to create more intelligent and flexible energy systems is key to ensuring a smooth energy transition process. A shift towards decentralized energy systems will ensure that everyone can have stable and affordable energy. Mutual partnership to support climate action is required, recognizing the importance of a just transition to a low-carbon economy enabling a fair and just energy transition for many countries. The energy transition system will be efficient and effective if it provides proper energy policy support and financial incentives through market-based approaches.

22. The G20 members need to commit to supporting the science and technology process and expanding access across member countries. Sharing financial support, knowledge and technology among G20 members is argued as a mechanism to achieve those commitments. The G20 needs to strengthen cooperation in order to overcome the pandemic and to mitigate climate change, and enhance research science and technology contribution, so that no one is left behind.

GUARANTEE THAT PEOPLE ARE AT THE CENTER

23. Rapid social and economic transformations are related to rising global temperature and have accelerated the changing conditions for communicable diseases. We have been building economies and communities in ways that have negatively impacted human health and well-being. We need to leverage science, technology, and innovation to involve people in building an interconnected health system and digital economy that benefit and create safety nets for all. We believe that ignoring the needs of peoples has made our societies and global structure more vulnerable to shocks.

24. Thus, we propose recommendations to ensure the sustainability and resilience of our societies and planet. Such is done by guaranteeing that all people are at the center, especially people in

vulnerable situations in the Global Health Architecture (GHA) and the Digital Economy Transformation (DET).

25. To equalize disparate access and powers, we must increase efforts to integrate the Social Sciences and Humanities into all public policy decisions affecting people, thereby *guaranteeing that people are at the center*. Thus we should:

- Establish commitment from all nations, governments, and all segments of society alike down to local communities and to the individual level to build meaningful, collective effort and deep participation at all levels with the aim to tackle global challenges;
- Increase society's resilience in the face of various forms of crises;
- Convey common global values based on necessary and appropriate research in the social sciences and humanities;
- Improve people's lives, livelihoods, and life chances in facing multi-dimensional human-made disruptions (i.e. geopolitical armed conflicts, social dislocations, conflicts), which cause other disasters (health, climate, energy disasters);
- Reduce barriers so all people can benefit from universal health, education, and global social economic access to all;
- Increase commitments from all participating governments down to local levels to cooperate in the global fundraising and harmonizing standards endeavor in realizing the GHA and DET;
- Strengthen resilience and adaptability appropriate in dealing with the prevailing diversity among nations, communities down to the individual levels within the GHA and DET;
- Ensure just, inclusive and affordable GHA and DET services for all so that no one is marginalized;
- Pool expertise, knowledge, imagination, and values of the Humanities and Social Sciences so that it is central to public and policy conversations about the GHA and DET around the world;
- Pursue these goals within all our fields, our contributions, our teaching/education, and our forms of public engagements so that the GHA and DET can benefit as many people as possible;
- Overcome difficulties in human solidarity and pursue common development in harmony; and
- Keep moving toward a community with a shared future for humankind, and jointly create a better future.

STRENGTHENING THE NEXUS BETWEEN DATA-RESEARCH-POLICY-PRACTICE FOR CLIMATE CHANGE, PANDEMIC PREPAREDNESS AND ECONOMIC RECOVERY

26. The experiences of handling, and coping with, the consequences of COVID-19 have taught us the value of evidence-based-policy-making. Serious problems exist, however, in countries where data are insufficient and lack precision to generate evidence-based-policy. In fact, addressing intersectional and complex health, climate change and socio-political-cultural problems, as well as moving towards just energy transition and economic digitization depends on hard numbers and evidence. Evidence-based-policy deriving from valid and reliable data not only provides short-term solutions, but also generates good practices of inclusion and interconnectivity of various parties and diverse sectors of human life for a sustainable future.

27. The COVID-19 pandemic and the transformed ecological, economic, and techno-socio-cultural environment mark a turning point for establishing a solid nexus of data – research – policy and practice for evidence-informed-policy and decision-making. Multi-stakeholders faced major challenges in translating a rapidly evolving body of new data and evidence stored in documents and digital devices into tangible response efforts on global-health, climate change, energy transition, and economic digitization. Both the pandemic and climate change also create situations, where health and environmental policy decisions receive unprecedented public attention through the use of various media and digital platforms.

28. Trusted relationships and dedicated governance structures for agile knowledge translation often play a key role for promoting the use of best available data and evidence for responsive and timely decision-making. In too many countries, however, siloed mentality within governmental institutions still poses a major technical and political challenge for efforts to incorporate insights from the latest global evidence into coordinated national policy and programs. Another problem is the uncertainty and incomplete information that can be presented in a cloud of misinformation. The lack of data integration between diverse sectors leads to inappropriate policy decisions which miss the target of achieving equal access to economic resources. This has to change if we are to have robust evidence-based policy, along with better regional sharing of available data, monitoring and evaluation of implementation that is essential for scientific knowledge to achieve its full potential for impacting positively on people's lives.

29. We, the Science20 (S20), recommend the following action measures.

30. In building resilience against global-health and climate-change threats, policymaking should:
- Bolster the adoption of evidence-based policy to strengthen political will and leadership;
- Establish institutional design to facilitate the exchange of scientific information for decision makers.

31. Since pandemics, climate change, and the need to develop a just energy transition and economic digitization are interrelated, advocacy to policymakers should:
- Incorporate the inter-connectivity and inclusion of diverse bodies of knowledge and communities;
- Provide space for engaging with youth, civil society, and politicians in advancing the scientific evidence-to-policy ecosystem at the global, regional and national levels;
- Implement intersectoral solutions through high quality data analysis and evidence based, people-centered approach, informed by inter-, multi-, transdisciplinary and collaborative research; and
- Support mitigation pathways and adaptation policies.

32. In monitoring and evaluating scientific-based policymaking on climate change, just energy transition, pandemics and economic digitization, we should:
- Involve all stakeholders, including the public and local communities; and
- Ensure transparency, and access to data availability and translatability, local as well as global, in various forms, including digital.

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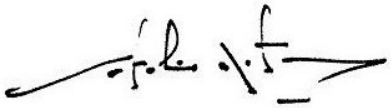

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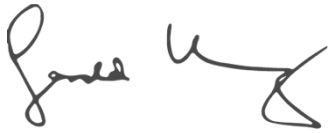

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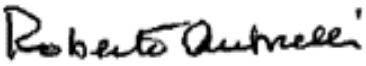

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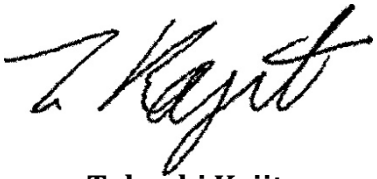

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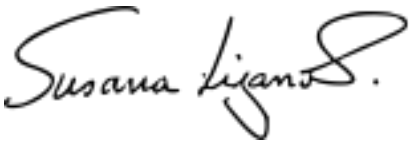

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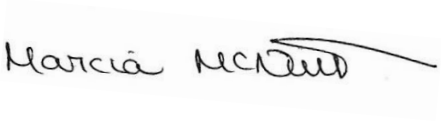
Muzaffer Şeker
President, Turkish Academy
of Sciences

Adrian Smith
President, Royal Society
United Kingdom

Julia Black
President, British Academy



Marcia McNutt
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