



Task Force 1
Global Health and COVID-19

Policy brief

FROM PATHOGENS TO PEOPLE: ENHANCING REPORTING AND SURVEILLANCE FOR MORE EFFECTIVE CONTROL OF DISEASE OUTBREAKS

SEPTEMBER 2021

Kent Buse The George Institute for Global Health

Sarah Hawkes University College London (UCL)

David Kaplan International Science Council (ISC)

Elena Rovenskaya International Institute for Applied Systems
Analysis (IIASA)

John Ryan Directorate General Health and Food Safety, European
Commission

Sergey Sizov International Institute for Applied Systems Analysis
(IIASA)

Paola Testori Coggi Lead Co-Chair T20 Italy Task Force Global
Health and Covid-19, National Technological Cluster on Life
Sciences ALISEI

T20 NATIONAL COORDINATOR AND CHAIR



T20 CO-CHAIR



T20 SUMMIT CO-CHAIR



Università
Bocconi
MILANO





ABSTRACT

Infectious disease outbreaks are a threat to global health and security. Current systems for early and effective reporting and monitoring of pathogens and other health threats, and high-quality surveillance of human diseases, face a number of challenges including incomplete and fragmented early warning and governance systems that are under-incentivised and under-resourced. We propose a number of opportunities for the G20 leaders to address these challenges, including: (1) establishing an 'Emerging Health Threat Data Platform' as a public good for independent, co-ordinated and scientist-led reporting and surveillance of pathogens; (2) supporting the development of a framework to incentivise scientists to participate in the platform and; (3) enhancing population health surveillance and vital registration systems through technical and financial investments in both the short and longer term.



CHALLENGE

As a global society we face the likelihood of infectious disease outbreaks occurring more frequently (Smith et al., 2014). We are at risk of increased zoonotic (animal to human) exposure including through a combination of habitat destruction and the climate crisis. Furthermore, demographic shifts resulting in more people living in high population density urban environments, and industrialized farming systems that result in the emergence of antibiotic resistance, are likely to lead to more frequent outbreaks of new, emerging or known (but resistant) pathogens. Addressing the growing threat of infectious disease outbreaks requires pathogen and disease reporting and surveillance systems that are fit for purpose – they need to both act as an early warning system for impending threats to human health (accurately, efficiently and effectively, e.g. by ensuring coverage is both widespread and sufficiently granular to identify groups at increased risk in a population) and to monitor an outbreak once established, applying a One Health approach.¹

Early warning systems for emerging outbreaks are crucial in promoting timely implementation of public policy measures that can avert deaths, reduce onward transmission and result in overall lower levels of social, economic and political fallout (O’Kell et al., 2020). The second report on progress of the Independent Panel for Pandemic Preparedness and Response reviewing early COVID-19 measures noted “there was potential for early signs to have been acted on more rapidly, with an escalation of response tied more immediately to the emerging information about the spread of the virus” and reflected that by missing this opportunity for early action on signs of an outbreak, this resulted in “lost opportunities to apply basic public health measures at the earliest opportunity” (Independent Panel, 2021).

Globally, reporting of outbreaks is governed by the International Health Regulations (IHR) of 2005 (World Health Assembly, 2005) which are recognized as a means of international cooperation for early detection and containment of infectious diseases. Adopted by all World Health Organization (WHO) member states, they are legally binding, The IHR also permit non-state actors to report suspected outbreaks directly to WHO. However, the non-state monitoring of potential outbreaks is often not of significant value even if it forms a relevant proportion of all reports to WHO, because most of it is centred on “digital disease detection” which includes social media and website scanning, as well as monitoring of big data and may run the risk of “false alarms” unless clear and consistent filters and criteria are applied to the results.

The COVID-19 pandemic has shown that existing reporting and surveillance systems exhibit a number of weaknesses, including:

- 1) comprehensive early warning systems of pathogens are incomplete and fragmented and therefore slow to respond to outbreaks; in addition, they do not include voluntary and independent reporting by experts;
- 2) once an outbreak is established, epidemiological surveillance systems are often of low capacity and are insufficiently granular (disaggregated) to identify places and populations requiring enhanced resources for effective and equitable control interventions; and



- 3) governance systems for surveillance for both pathogens and people are politicized, under-incentivised and under-resourced.

The transparent and timely reporting of potential outbreaks by scientists, in both the public and private sectors, is currently not realizing its full potential for two main reasons: (1) in some settings scientists may be operating within systems where their capacity for prompt, independent and transparent reporting is curtailed; and (2) career structures and incentives for scientists usually focus on the model of peer-reviewed publishing rather than collaborative information-sharing – which means that delays to and disincentives for data sharing, data accessibility and early reporting are present.

Once an epidemic or pandemic is officially declared, a more efficient and transparent system of epidemiological monitoring and surveillance of human population would enable countries to identify communities vulnerable to infection, enhance evaluation of the impact of intervention measures, increase the effectiveness and equity of public health control strategies, while the added transparency could reduce ‘infodemics’ on social media and reassure both domestic and international publics.



PROPOSAL

G20 countries employ almost 90% of the world's researchers (Editage, 2019) and account for over 90% of global R&D expenditure (UNESCO, 2016; OECD/UNDP, n.d.). As a result, the G20 is well positioned to lead in advancing innovative solutions for future pandemic control. This policy brief makes several proposals in that regard. The brief covers activities undertaken in both the public and private sectors – the latter is acknowledged to play a significant (and growing) role in data generation and management, including in relation to disease outbreaks.

INDEPENDENT, CO-ORDINATED, SCIENTIST-LED MONITORING OF EMERGING HEALTH THREATS

Independent, incentivised and scientist-led reporting and monitoring of pathogens and other emerging health threats would enable researchers to share information in a peer-to-peer network, free of the political constraints inherent in the current reporting systems.

We propose the following mechanisms to enhance early warning systems:

Establish an 'Emerging Health Threat Data Platform' as a public good for scientist-led reporting on new and emerging pathogens, treatment-resistant pathogens, or any other element that could cause a public health emergency, following a One Health integrated approach.

Participation in such a global platform would enable the scientific community to be rapid and flexible in sharing information and would also enhance scientists' access to information needed to study emerging/novel pathogens, and initiate risk assessments. The platform would be open to publicly funded scientists. Inputs from scientists working in the private sector should be included, subject to the necessary assurances of independence. Participation for all scientists would be voluntary, and subject to strict criteria of standards and formats to ensure validity and quality of data as well as independence and respect of confidentiality. Scientists in both the public and private sectors should be incentivised to contribute to the platform – benefits of participation could include measures that attribute the intellectual contribution of scientists, including through recognition of overall societal impact.

The One Health integrated approach will ensure consideration of all alerts arising at the human-animal and environment interface and cover alerts arising in animal populations or food sources, which could impact on human health.

In order to mitigate risk of information overload and to promote data quality, the platform should be equipped with digital tools drawn from artificial intelligence in order to efficiently manage, verify and respond appropriately to data received.

The platform would require resources and a structure, such as a centralized secretariat, governed by scientists and independent of any national interest, in order to ensure accessibility



by all scientists worldwide. The secretariat would seek diversified funding so as to promote and retain independence and ensure access and sharing of data. Additionally, the secretariat would foster links to the appropriate global agency charged with the authority to investigate and respond to suspected outbreaks.

Support the engagement of publicly financed scientists and institutions in the global platform to facilitate their access to high-quality data. Support should include the provision of incentives along with regulations to encourage their participation. This would ensure: (i) timely sharing of newly produced data; (ii) timely quality control and validation of data (NASEM, 2018); and (iii) ease of access for scientists to use other scientists' data (Wilkinson et al., 2016). Collectively these can be considered as a “data as a global good” system.

This system would include: (i) adjustments of the principles of the career promotion of publicly funded scientists (Royal Society, 2020), so as to put more emphasis on the societal impact of research activities and less emphasis on formal publication metrics (Royal Society, n.d.); this includes incentives for researchers to make data accessible; (ii) enhanced standards for data validation, harmonization and reproducibility; and (iii) a system of fast and inclusive peer review (Vesper, 2018).

Many governments were able to enter into arrangements with the private sector in order to access data held by the private sector that were essential to track and trace systems. The private sector has additional data that is currently not readily accessible to the wider publicly funded scientific community. New incentives and arrangements are needed to facilitate collaboration between scientists in the public and private sectors (ICC, 2020). Specifically, governments should investigate additional incentives and arrangements so that the commercial sector shares data that could be useful for research that informs policy responses to a rapidly evolving pandemic.

The need to strengthen and adequately resource surveillance on potential outbreaks, including rapid and transparent cross-sectoral information and data sharing at international level has been highlighted both in the Rome Declaration of the Global Health Summit (EU, 2019) and in the G7 Carbis Bay Declaration (G7, 2021), so as to ensure effective surveillance of pathogens based on the One Health approach. In addition, the WHO has committed to the establishment of a new Hub for Pandemic and Epidemic Intelligence which, through new collaborations of countries and partners, will use innovative tools and approaches in order to increase both availability and linkage of data, and develop predictive models for risk analysis. The WHO has declared that this new hub will accelerate global collaborations across public and private sector organizations, academia and international partner networks (WHO, 2021).

The new Emerging Health Threat Data platform which is proposed in this policy paper would be one of the networks that feed into the new WHO Hub. By leveraging the vast set of data, information and analytics produced through the independent collaboration of the global community of scientists, the proposed platform would directly contribute to the mission of the new WHO Hub.

Enhanced, co-ordinated population health surveillance and vital registration systems. High-quality population health data lies at the core of both effective and equitable responses to public health emergencies; it is central to designing evidence-informed policy-making



and to guiding and evaluating targeted interventions that are likely to have maximum effect in mitigating the impacts of a pandemic or epidemic. Despite repeated calls for data that is fit for purpose, and in line with the commitment of Sustainable Development Goal 17.18 (UN, 2017) for data that is disaggregated and relevant in national contexts, the COVID-19 pandemic has highlighted the weaknesses of many health and vital registration systems. WHO guidelines (WHO, 2020) on public health surveillance of COVID-19 call on countries to report data disaggregated, at a minimum, by age and sex. However, over the course of the pandemic surveillance data has been reported inconsistently and often in an ad hoc manner, and data quality (including whether or not it is disaggregated) remains problematic. For example, in the first 12 months of the pandemic, approximately 20% of all, and 30% of all cases, were reported without any indication of whether they referred to men or women (Sex, Gender and COVID-19 Project, 2020), moreover, the proportion of countries reporting sex-disaggregated data appears to be falling (Sex, Gender and COVID-19 Project, 2021). Low- and lower-middle-income are less likely to report disaggregated data than high-income countries (Hawkes et al, 2021). However, even among the G20 countries, several have either never or only infrequently and inconsistently reported sex-disaggregated data on COVID-19.

Such findings are disappointing given the urgency in accessing accurate data in a pandemic, and they are compounded by the existing weaknesses of both disease surveillance and vital registration systems. It is estimated, for example, that only around one third all of deaths in Africa are registered (UNECA, 2017), and inequalities remain even in death with higher registration rates for men compared to women, and for urban compared with rural populations, in some countries (CVRS, 2019). Improving surveillance during a pandemic is possible but requires an investment in pre-existing (but currently weak) vital registration systems and the creation of robust and resilient data infrastructures.

Public health surveillance systems for reporting disaggregated data exist and can be replicated during pandemics and epidemics. For example, for established epidemics such as HIV, a global monitoring system headed by UNAIDS, and mandated through the 2016 United Nations Political Declaration on Ending AIDS (UNAIDS, 2020), collects relevant, harmonized and disaggregated data on progress towards global targets. Meanwhile, the COVID-19 pandemic has been characterized by the establishment of independent monitoring systems (Johns Hopkins University Coronavirus Resource Center, 2020; Our World in Data, 2021; Sex, Gender and COVID-19 Project, 2020) that have responded to the gaps in global systems and regularly published data on, for example, sex- and age-disaggregated cases and deaths.

We propose the following actions:

- Increase technical and financial investments to enhance population surveillance during public health emergencies;
- In the context of the IHR, countries to be supported and encouraged to report health emergency data to WHO in a standardized, disaggregated manner (including age and sex), with additional nationally relevant disaggregation as appropriate to each country; and
- Support – financial, technical – both public health surveillance and vital registration systems in low- and lower-middle income countries over the longer term.



ROLE OF G20 IN SUPPORTING GLOBAL HEALTH THROUGH STRONGER INDEPENDENT MONITORING OF EMERGING HEALTH THREATS AND ENHANCED POPULATION HEALTH SURVEILLANCE

We call on G20 leaders at the Italy Summit “People, Planet and Prosperity” on 30–31 October 2021 to make specific, measurable and time-bound commitments in three areas to support rapid alert and health population surveillance efforts to mitigate the impact of future pandemics on health, society, economy and environment, in particular by:

- Supporting the establishment of a science-led emerging health threat reporting and monitoring platform, called ‘Emerging Health Threat Data Platform’. This will include resources for the establishment of a new Data Platform on emerging health threats as a public good, based on improved networking of scientists and a more efficient exchange and assessment of information on potential risks, following a One Health integrated approach. This platform should be scientist-led and subject to strict guidance and regulations covering quality, independence and confidentiality.
- Coordinating and supporting the development of a framework of incentives for researchers to make data accessible and commit to piloting this framework in G20 countries. This will require a broad consultative process that includes representatives of national bodies governing science, funders, publishers, the commercial sector, scientists and other relevant stakeholders.
- Ensuring reporting of harmonized and disaggregated surveillance for people and populations globally, including through:
 - modelling good practices for sex-and age-disaggregated reporting, including for vaccine coverage at national level in G20 countries;
 - supporting the strengthening of capacity in lower-resourced countries to report disaggregated data from existing civil registration and vital statistics programmes as well as from health system surveillance programmes, and encourage all countries to report such disaggregated data to WHO (health data) and UN statistical bodies (vital statistics);
 - providing additional support to WHO for collating, reporting and publishing disaggregated data.



NOTES

¹ 'One Health is a collaborative, multisectoral, and transdisciplinary approach — working at the local, regional, national, and global levels — with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment' (<https://www.cdc.gov/onehealth/basics/index.html>).



REFERENCES

CVRS (Centre of Excellence for Civil Registration and Vital Statistics Systems) (2019). Strengthening CRVS systems, overcoming barriers and empowering women and children. <https://crvssystem.ca/sites/default/files/assets/files/CRVS%20Brief%202%20EN.pdf>, accessed 25 July 2021

Davies SE (2020). Reporting disease outbreaks in a world with no digital borders. In SE Davies (ed). *The Oxford Handbook of Global Health Politics*. <https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780190456818.001.0001/oxfordhb-9780190456818-e-31>, accessed 25 July 2021

Editage (2019). *INFOGRAPHIC: What's the score: How the G20 nations performed in research in 2018-19*. <https://www.editage.com/insights/whats-score-how-g20-nations-performed-research-2018-19>, accessed 25 July 2021.

EU (European Union) (2019). *Rome declaration of the 2021 Global Health Summit*. https://global-health-summit.europa.eu/rome-declaration_en, accessed 25 July 2021

G7 (2021). G7 Carbis Bay Declaration, 2021. <https://www.consilium.europa.eu/media/50362/g7-carbis-bay-health-declaration-pdf-389kb-4-pages.pdf>, accessed 25 July 2021

Hawkes S, Tanaka S, Pantazis A, Gautam A, Kiwuwa-Muyingo S, Buse K et al. (2021). Reported but not revealed: Exploring the relationship between sex and gender, country income level and COVID-19. *The Lancet, Global Health*, 9(6):e751–752. [https://www.thelancet.com/journals/lan-glo/article/PIIS2214-109X\(21\)00170-4/full-text](https://www.thelancet.com/journals/lan-glo/article/PIIS2214-109X(21)00170-4/full-text), accessed 25 July 2021

ICC (International Chamber of Commerce) (2020). *COVID-19 pandemic: Lessons for international research collaboration and information exchange*. <https://iccwbo.org/publication/covid-19-lessons-for-international-research-collaboration-and-information-exchange/>, accessed 25 July 2021

Independent Panel (2021). *Second report on progress by the Independent Panel for Pandemic Preparedness and Response*. <https://theindependentpanel.org/wp-content/uploads/2021/01/Independent-Panel-Second-Report-on-Progress-Final-15-Jan-2021.pdf>, accessed 25 July 2021

Johns Hopkins University Coronavirus Resource Center (2020). <https://coronavirus.jhu.edu>, accessed 25 July 2021

NASEM (The National Academies of Sciences, Engineering, and Medicine) (2018). *Open science by design: realizing a vision for 21st century research*. <https://www.nap.edu/catalog/25116/open-science-by-design-realizing-a-vision-for-21st-century>, accessed 22 November 2020

OECD/UNDP (Organisation for Economic Co-operation and Development/United Nations Development Programme) (n.d.). *G20 contribution to the 2030 agenda progress and way forward*. <https://www.oecd.org/g20/summits/osaka/OECD-UNDP%20Report-G20-Contribution-2030-Agenda.pdf>, accessed 25 July 2021

O’Kell LC, Verity R, Watson OK, Mishra S, Walker P, Whittaker C, et al. (2020). Have deaths from COVID-19 in Europe plateaued due to herd immunity? *The Lancet*, 395(10241): e110–e111. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7289569/>, accessed 25 July 2021



Our World in Data (2021). <https://ourworldindata.org/>, accessed 25 July 2021

Royal Society (2020). *Science in lockdown*. <https://royalsociety.org/blog/2020/05/science-in-lockdown-part-one/>, accessed 25 July 2021

Royal Society (n.d.) <https://royalsociety.org/topics-policy/projects/research-culture/research-culture-conference/the-pitch/the-pitch-winner-dr-alexandra-freeman/>

Sex, Gender and COVID-19 Project (2020). *The COVID-19 sex-disaggregated data tracker*. <https://globalhealth5050.org/the-sex-gender-and-covid-19-project/the-data-tracker/>, accessed 25 July 2021

Sex, Gender and COVID-19 Project (2021). *The COVID-19 sex-disaggregated data tracker*, March 2021 update. Available at: <https://globalhealth5050.org/wp-content/uploads/March-2021-data-tracker-update.pdf>, accessed 25 July 2021

Smith KF, Goldberg M, Rosenthal S, Carlson L, Chen J, Chen C, Ramachandran S (2014). Global rise in human infectious disease outbreaks. *Interface*, 11(101):n.p. <https://royalsocietypublishing.org/doi/full/10.1098/rsif.2014.0950>, accessed 25 July 2021

UN (United Nations) (2017). Sustainable Development Goal 17.18. <https://unstats.un.org/sdgs/indicators/indicators-list/>, accessed 25 July 2021

UNAIDS (2020). *Guidance: Global AIDS monitoring, 2021*. https://www.unaids.org/sites/default/files/media_asset/global-aids-monitoring_en.pdf, accessed 25 July 2021

UNECA (United Nations Economic Commission for Africa) (2017). *Report on the status of civil registration and vital statistics in Africa: outcome of the Africa pro-*

gramme on accelerated improvement of civil registration and vital statistics systems monitoring framework. Addis Ababa. <https://repository.uneca.org/handle/10855/24047>, accessed 25 July 2021

UNESCO (2016). *The G20 accounts for 92% of global spending on research*. http://www.unesco.org/new/en/media-services/single-view/news/the_g20_accounts_for_92_of_global_spending_on_research/, accessed 25 July 2021

Vesper I (2018). Peer reviewers unmasked. *Nature*, 7 September. <https://www.nature.com/articles/d41586-018-06602-y>, accessed 25 July 2021

Wilkinson M, Dumontier M, Aalbersberg I et al. (2016). The fair guiding principles for scientific data management and stewardship. *Sci Data*, 3(160018). <https://www.nature.com/articles/sdata201618>, accessed 25 July 2021

World Health Assembly (2005). *Revision of the International Health Regulations, WHA58.3*. Geneva: World Health Organization

WHO (World Health Organization) (2020). *Public health surveillance for COVID-19: Interim guidance*. 7 August. Geneva: World Health Organization

WHO (World Health Organization) (2021). *WHO, Germany launch new global hub for pandemic and epidemic intelligence*. <https://www.who.int/news/item/05-05-2021-who-germany-launch-new-global-hub-for-pandemic-and-epidemic-intelligence>, accessed 25 July 2021



ABOUT THE AUTHORS



Kent Buse The George Institute for Global Health

Buse directs the Healthier Societies program at The George Institute for Global Health and co-directs Global Health 50/50. He served for 12 years as senior advisor to the Executive Director and as Chief, Strategy, Research and Policy at UNAIDS. Kent has taught at the Yale University School of Public Health and the London School of Hygiene and Tropical Medicine. He is author/editor of five books and numerous publications. Kent is Conjoint Professor, Faculty of Medicine, University of New South Wales and Visiting Professor, Imperial College London.



Sarah Hawkes University College London (UCL)

Hawkes is Professor of Global Public Health at University College London, co-Director of Global Health 50/50, and co-chair of the Lancet Commission on Gender and Global Health. She focuses on gathering public health evidence, strengthening public health capacity and influencing public health policy with a focus on gender and human rights. She works closely with national Governments, research organizations, civil society organizations and the multilateral system.



David Kaplan International Science Council (ISC)

Kaplan is an economist and taught at the University of Cape Town for more than 38 years. He held positions in the South African government, including: Chief economist of the Department of Trade and Industry and the Department of Economic Development and Tourism, Provincial Government of the Western Cape. He served on the Presidential Commission to Investigate the Development of a Comprehensive Labour Market Policy and on the National Advisory Council on Innovation (NACI) and is a former board member of the Technology Innovation Agency (TIA). He is Senior Research Specialist at the International Science Council in Paris.



Elena Rovenskaya International Institute for Applied Systems Analysis (IIASA)

Rovenskaya is Program Director of the Advancing Systems Analysis (ASA) program at the International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria. She has background in applied mathematics. Her scientific interests lie in the fields of optimization, decision sciences and mathematical modeling of complex socio-environmental systems. As the ASA Program director, Rovenskaya is coordinating a team of 80+ scientists who work on new systems analytical methods, which enable higher levels of agility to support policy and societal decision making.



John Ryan Directorate General Health and Food Safety, European Commission

Ryan is Director of the European Commission Public Health directorate since September 2016. He is currently the Commission representative on the Board of the European Centre for Disease Prevention and Control. Current priorities include management of the Covid pandemic, implementation of an EU cancer plan, antimicrobial resistance, vaccination policies, and the implementation of financial instruments to support health, including research.



Sergey Sizov International Institute for Applied Systems Analysis (IIASA)

LLM (Hons) is Science Diplomacy Officer at IIASA, where he plays an active role in coordinating science diplomacy activities and interaction with government authorities, international organizations, and other stakeholders. He acts as Big Research Infrastructures for Diplomacy and Global Engagement through Science (BRIDGES) network Secretary, IAEA INIS Alternate Liaison Officer for IIASA, and was IIASA-ISC Strengthening Science Systems Team Alternate Leader. He is an author of a number of research publications and holds a diplomatic rank of First Secretary.



Paola Testori Coggi Lead Co-Chair T20 Italy Task Force Global Health and Covid-19, National Technological Cluster on Life Sciences ALISEI

Testori Coggi is Special Advisor of the Italian Technological Cluster of Life Sciences Alisei. She is a member of the Italian Delegation to the EU Programme Horizon Europe, Cluster Health. Testori was Director General for Health and Consumer within the European Commission until 2014 and President of the Price and Reimbursement Committee of the Italian Medicines Agency until 2018. Testori Coggi is a biologist with a Masters degree in Ecotoxicology; she received a Doctor Honoris Causa in Veterinary Medicine and she was awarded the Cross of Merit of Official of the Italian Republic.