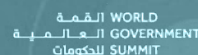


Embracing Innovation in Government

GLOBAL TRENDS 2020



Innovative Responses to the COVID-19 Crisis

JULY 2020

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Caveat: Many of the innovative initiatives discussed in this report are self-reported by countries. They are presented in this report as accurately as possible, given the information available. Additionally, examples are included throughout the report as observations, with no judgement made about their merits. Innovative responses are, by definition, new, and it takes time to know whether new things work, and if they work, and whether they are appropriate or wanted. It is also important to note that there are undoubtedly countless other powerful and inspiring innovations to respond to COVID-19 happening all over the world. This report can only capture the key themes observed by OPSI and the MBRCGI, and a small handful of examples that illustrate them.



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OPSI Observatory of Public Sector Innovation

OPSI serves as a global forum for public sector innovation, helping governments to understand, test and embed new ways of doing things through the application of fresh insights, knowledge, tools and connections.

🏠 oecd-opsi.org
🐦 [@OPSIgov](https://twitter.com/OPSIgov)
✉ opsi@oecd.org
📄 oe.cd/opsinewsletter

مركز محمد بن راشد
للابتكار الحكومي
MOHAMMED BIN RASHID CENTRE
FOR GOVERNMENT INNOVATION



MBRCGI works to stimulate and enrich the culture of innovation within government through the development of an integrated innovation framework. The goal is for innovation to become one of the key pillars of the UAE government with the aim of developing government operations and enhancing competitiveness to make the UAE one of the most innovative governments around the world.

🏠 mbrcgi.gov.ae
🐦 [@mbrinnovation](https://twitter.com/mbrinnovation)
✉ info@mbrcgi.gov.ae

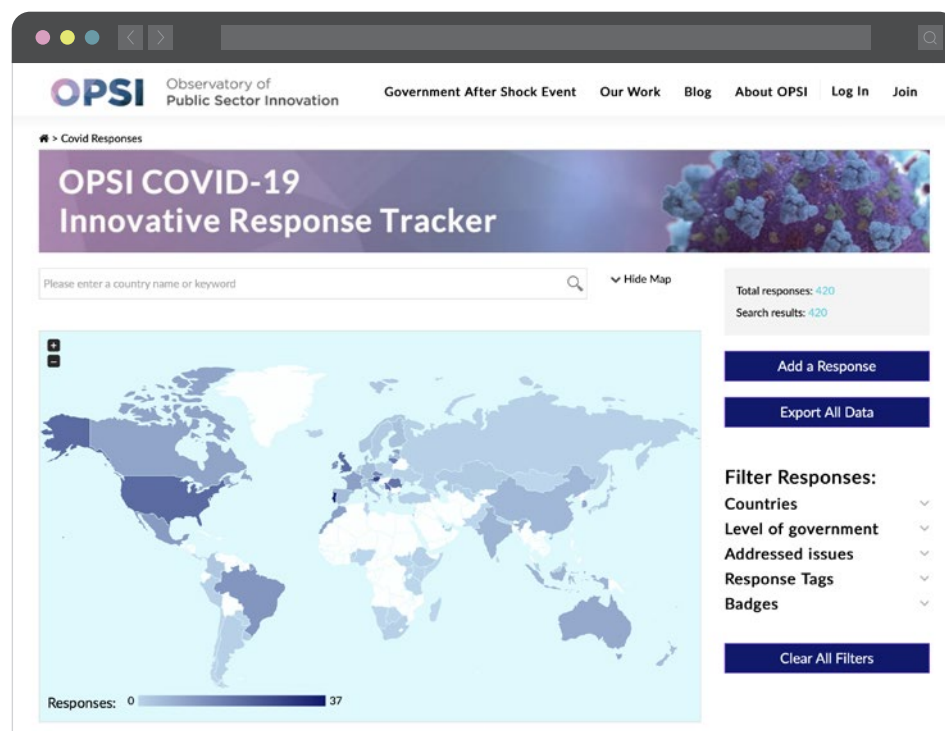
Introduction

The last few months have made 2020 one of the most challenging years in most of our lifetimes. The novel coronavirus (COVID-19) pandemic has rapidly and drastically changed the daily lives of nearly everyone, with more than half of the world's population placed in lockdown (Sandford, 2020), the most severe economic recession in nearly a century, the collapse of economic activity by as much as 20-30% in some countries, record levels of unemployment (OECD, 2020a), overwhelmed healthcare systems pushed to the brink of collapse and, tragically, hundreds of thousands of deaths, including neighbours and loved ones. Few governments have been prepared to deal with a crisis of this nature, and all governments are working to grapple with its ramifications.

Under normal circumstances, the OECD Observatory of Public Sector Innovation (OPSI) and the United Arab Emirates (UAE) Mohammed Bin Rashid Centre for Government Innovation (MBRCGI) publish an annual report on key trends in government innovation, focusing on areas such as inclusive policy making, emerging technologies and creative solutions to longstanding challenges.¹ However, 2020 is not a normal year. We still intend to report on emerging trends that we have uncovered, and to tell the stories of innovators who are working to make a difference in how government serves its people. However, like the governments with whom we collaborate, much of our attention has shifted to the COVID-19 crisis. OPSI and the MBRCGI are working to support governments as they respond to the crisis, confront its consequences and impacts, and over time, move towards recovery.

OPSI and the MBRCGI believe that innovation is imperative to success in moving forward. In a chaotic situation with no precedent and no playbook, governments and their partners have few other choices but to act in new ways as they enter uncharted territory. In this context, the sharing of ideas and practices is critical: pandemics do not remain within borders and silos, and neither should the global response. To facilitate this, OPSI and its colleagues in the OECD Open and Innovative Government (OIG) division, along with our partners GovInsider² and the Centre for Public Impact,³ have issued a global Call for Innovative Government Responses to COVID-19, in order to gather innovative solutions being piloted by organisations responding to the crisis.⁴ Innovators from 60 countries have submitted over 400 innovative responses to this ongoing call, which are available on OPSI's COVID-19 Innovative Response Tracker (Figure 1).⁵ OPSI and the MBRCGI hope that these responses can inspire action, enable shared learning, embed successes and accelerate the transformative potential of innovation during this global emergency.⁶

Figure 1: COVID-19 Innovative Response Tracker



Source: <https://oe.cd/covidtracker>

1 The reports for 2017-19 are available at <https://oe.cd/innovationtrends>.

2 <https://govinsider.asia>.

3 www.centreforpublicimpact.org/coronavirus.

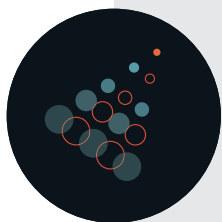
4 <https://oe.cd/covidcall>.

5 <https://oe.cd/covidtracker>.

6 More broadly, OECD has created a dedicated COVID-19 Hub that includes research, data, policy responses and perspectives from experts, among other relevant materials. See www.oecd.org/coronavirus. OPSI's colleagues in the OECD Science, Technology and Innovation Directorate have also compiled responses to a Survey on Science and Innovation Policy Responses to COVID-19 at <https://stip.oecd.org/Covid.html>.

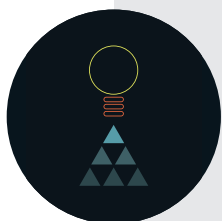
Consistent with these hopes and in keeping with tradition of scanning for innovation trends, OPSI and the MBRCGI have analysed these responses and conducted research in order to highlight key themes in action taken against the virus and in support of people. We have also met virtually with a number of innovation teams behind these efforts to hear their stories. What we have found and heard has been inspiring. In the face of this unprecedented and harrowing crisis, governments and civic-minded organisations and individuals have, without hesitation, stepped up to meet the challenge with creative solutions. This report serves to highlight these themes, and to tell these stories.

Through their analysis and research, OPSI and the MBRCGI have prepared this report, which zooms in on five key themes that are driving these public sector innovation efforts during the crisis:



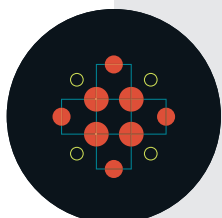
01 : Rapid Acceleration of Digital Innovation and Transformation.

Compressing many years' worth of technological advancements into a few weeks and months.



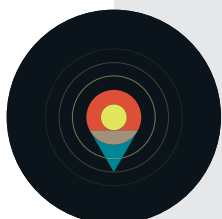
02 : Seeking Bottom-up Solutions and Insights.

Building conduits for new ideas, solutions and insights to come from citizens, residents and businesses.



03 : Social Solidarity and Caring.

The self-activation and mobilisation of millions of individuals who want to help their communities.



04 : Reducing the Spread Through Virus Tracking and Adaptive Action.

Taking actions that are critical to virus tracking and contact tracing in order to "flatten the curve" and limit the spread of the virus.



05 : Forging a Path to Recovery.

Devising exit strategies and ways to get economies back on track while also re-envisioning what the new normal should be.

This report discusses each of these themes and presents real-world examples and case studies.

US Digital Response

UNITED STATES

A non-partisan, volunteer-driven effort to match experienced volunteer technologists from across the country to governments responding to COVID-19. USDR now has over 5 500 volunteers.

Hack the Crisis

ESTONIA → GLOBAL

A 48-hour hackathon aimed at building solutions to respond to COVID-19. Hack the Crisis has been replicated in many other countries and has spawned a worldwide movement, the Global Hack.

SPOTON

SINGAPORE

A crowd thermal-sensing solution enhanced with artificial intelligence to facilitate quick, effective, crowd temperature screening with low-cost hardware components.

The COVID-19 crisis has emphasised the importance of the role of, and trust in, government. It has also highlighted the necessity for governments to be able to respond quickly and effectively using new tools and technologies and engaging and working with citizens and stakeholders in different ways.⁷ The crisis has reinvigorated government innovation agendas, and the responses discussed in this report demonstrate this capacity to act quickly in agile, creative and effective ways. The crisis has also emphasised the fact that although all governments operate in unique contexts, there are common threads that can unite them, and working together and learning from one another can make the public sector stronger. There are still many unknowns and the future implications remain unclear, but innovation can and is helping to build a strong foundation for recovery.

Going forward, OPSI and the MBRCGI will continue to report on global innovation trends identified in 2020 through a series of short reports and an evolving digital story,⁸ culminating in OPSI's two-day virtual event, Government After Shock: An unconventional event for unconventional times, which will take place on 17-18 November 2020.⁹ All innovators are invited to participate.



⁷ The topics are discussed in-depth in the upcoming OIG report COVID-19 Crisis: A cruel catalyst for government transformation? (<https://oecd-opsi.org/covid-catalyst>).

⁸ <https://trends.oecd-opsi.org>. This work has been conducted as part of the Middle East and North Africa (MENA)-OECD Governance Programme (<https://oe.cd/mena-gov>).

⁹ <https://oe.cd/gov-after-shock>.

KEY THEME 01

Rapid Acceleration of Digital Innovation and Transformation



“As we move towards the next phase of the crisis, there is a unique chance for governments to work towards a digitally-enabled recovery that strengthens the inclusiveness and resilience of our economies and puts people’s well-being at the core.”

– Angel Gurría, OECD Secretary-General

Governments around the world have made significant efforts in recent years to shift away from traditional processes and services towards fully digital solutions.¹⁰ Each government has reached a different level of maturity in its digital transformation (OECD, forthcoming, a), however few were technologically prepared to deal with a crisis of the magnitude of COVID-19. In spite of this, governments have stepped up to take action. Faced with no alternative, they have compressed years’ worth of technological advancements into a few weeks and months. OPSI has found that these efforts are concentrated in three areas: 1) moving towards virtual government operations and services; 2) crafting digitally enabled timely and tailored communication to the public; and 3) enabling these digital innovation and transformation efforts through dedicated teams, guidance, resources and partnerships.¹¹



¹⁰ OECD efforts to support governments in achieving digital transformation are led by its Digital Government and Open Data Unit (<https://oe.cd/diggov>), in coordination with the OECD Working Party of Senior Digital Government Officials (E-Leaders) (<https://oe.cd/eldrs>). This work is guided by the OECD Recommendation on Digital Government Strategies (<https://oe.cd/diggovstrategies>).

¹¹ The OPSI COVID-19 Innovative Response Tracker (<https://oe.cd/covidtracker>) includes hundreds of examples from around the world. This section highlights key themes that OPSI has identified based on the tracker and research. While this section of the report can only highlight a handful of examples, many additional innovative bottom-up responses can be found at <https://oe.cd/covid-digital>.

Moving towards a digital, virtual government

Governments often have to imagine contingencies for scenarios such as “what happens if the website goes down?”. The COVID-19 crisis has forced them to confront the question “what happens if physical offices and schools go down?” and the ensuing ramifications for government. The demand for digital processes and services has never been greater, and governments have had to apply innovative approaches to strengthen their ability to meet their missions and serve the public.

In terms of inward-focused efforts, many governments have shifted to teleworking. While this may not seem innovative, for some governments this has meant going online for the very first time, and has required many technological, cultural and process changes within an extremely short period of time. Some departments, such as Transport Canada, have gone as far as to adopt telework as the default going forward¹². Becoming a virtual government is not just a matter of telework, however. Governments have had to make systemic and structural changes to operations that normally would have taken years to implement (if ever). Some of the most rapid innovations have come from legislatures, which often times serve as the lead in navigating countries through the crisis. During the worst of the outbreak, the United Kingdom (UK) Parliament, for example, held proceedings via Zoom¹³ and shifted to digital voting,¹⁴ which would have been unthinkable just a few months ago. Similar actions have been taken in other countries (e.g. Brazil),¹⁵ and internationally for voting in the European Parliament.¹⁶ Only time will tell if these digital transitions will last, as systemic and structural changes will be necessary to make such changes permanent. Reversion to traditional operations can happen quickly; for example, UK MPs have already voted to abolish the virtual parliament and require in-person voting (Payne, 2020).

In terms of public-facing services, governments have been working for years to build out infrastructure and capabilities, but the COVID-19 crisis has served as a catalyst to make this a reality. The UAE, for instance, has re-oriented practically all services to be available virtually 24/7 on a unified “Services

Figure 2: Virtual wedding in Denver, Colorado



Source: wedfully.com

Around the Clock” website.¹⁷ Services that were difficult to imagine in virtual form a few months ago are now routinely conducted online. Notable examples include:

- Morocco,¹⁸ and Colorado (Figure 2) and California¹⁹ in the United States, are now holding marriage services through videoconferencing. Malaysia is using the same technology for court trials.²⁰
- Many countries have advanced rapidly in implementing telehealth practices, such as video consultations with doctors. This has included relaxing regulatory barriers and ensuring costs are covered through public health programmes (OECD, 2020b). The Government of Japan, for example, has created Mediplat, an innovative free online health consultation service that connects doctors with patients.²¹ Ireland created a new virtual consultation platform in just four days.²²

Some of the most noticeable shifts have occurred in the field of education. Governments have had to rethink the forms that education can take when physical contact is not possible, and have come up with a variety of digitally enabled solutions:

¹² <https://oe.cd/tc-wfh>.

¹³ www.parliament.uk/business/news/2020/april1/virtual-house-of-commons-end-of-week-one.

¹⁴ www.parliament.uk/business/news/2020/may/mps-cast-first-ever-remote-votes-in-commons-chamber.

¹⁵ <https://oe.cd/br-remote-parliament>.

¹⁶ <https://oe.cd/eu-remote-voting>.

¹⁷ <https://u.ae/en/services>. See <https://oe.cd/uaeservices> for more details.

¹⁸ <https://oe.cd/morocco-marriage>.

¹⁹ <https://oe.cd/california-marriage>.

²⁰ <https://oe.cd/my-courts>.

²¹ www.meti.go.jp/english/press/2020/0311_002.html.

²² <https://oe.cd/ie-telehealth>.

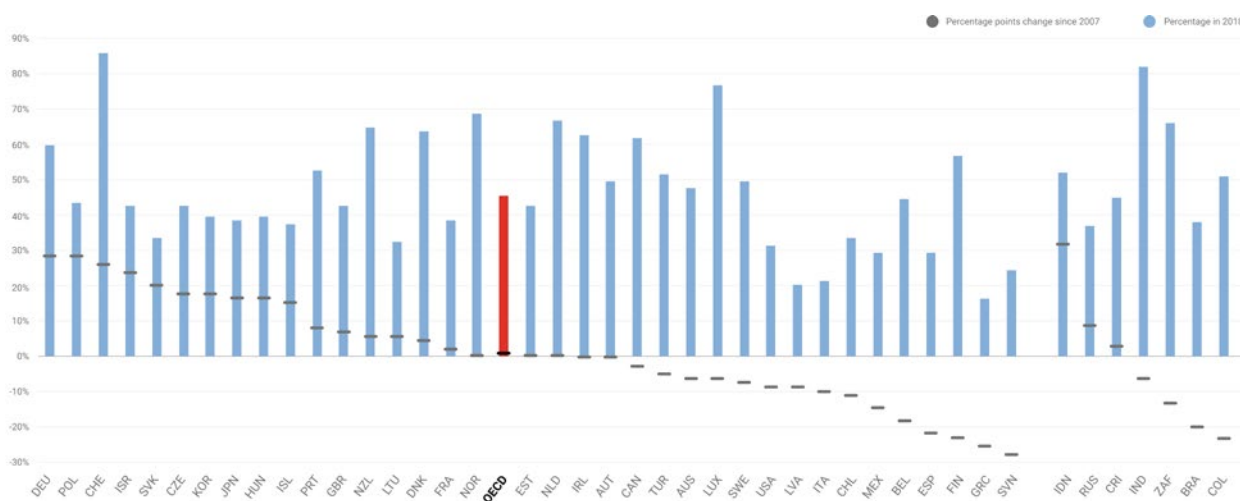
- The Russian Federation created a central Situation Centre to manage responses to higher education as the crisis evolves.²³
- Austria,²⁴ the Czech Republic²⁵ and Morocco²⁶ have launched a central learning platform that offers teachers, students and parents a wealth of information and assistance materials.
- Many countries have shifted to virtual classes, including Portugal,²⁷ Sweden²⁸ and Uruguay.²⁹ Classes are being broadcast on national TV stations in Serbia,³⁰ and through a YouTube-like platform in Austria.³¹

While governments have become increasingly digital and virtual, they have also recognised that not all citizens and residents are prepared or equipped to follow suit. Portugal has sought to address this situation by developing tutorials for digital public services.³² Meanwhile, Indonesia has partnered with the private sector to introduce live virtual classrooms and free or inexpensive Internet connections to help students access them.³³ Austria is loaning thousands of devices to students to enable them to participate in remote learning.³⁴ These types of solutions can help the public match the new speed of the public sector and can help ease pre-existing challenges associated with the digital divide.

Digitally-enabled timely and tailored communications

While shifting to virtual environments and accelerating the development of digital services have been major focuses of government, they have also placed great emphasis on leveraging digital means for external communication efforts. Ensuring that members of the public are well informed empowers them to make decisions that promote health and well-being in a time of crisis. It is also important that governments work to ensure that the public is not misinformed about COVID-19 through incorrect information and “fake news”. The efficacy of these actions rests on grounding them in open government principles, chiefly transparency, to build trust in governments, which is at a record low (OECD, forthcoming, b) (see Figure 3). Governments have embarked on many courses of action to meet this goal.³⁵

Figure 3: Trust in national governments in 2018, compared to 2007



Source: Gallup World Poll, 2018.

23 <https://oe.cd/ru-education>.

24 <https://oe.cd/at-education>.

25 <https://oe.cd/cz-learning>.

26 <https://oe.cd/mr-learning>.

27 <https://oe.cd/colibri>.

28 <https://oe.cd/se-learning>.

29 <https://oe.cd/uy-schooling>.

30 <https://oe.cd/rs-education>.

31 <https://oe.cd/edutube>.

32 <https://oe.cd/pt-tutorials>.

33 <https://oe.cd/id-education>.

34 <https://oe.cd/at-devices>.

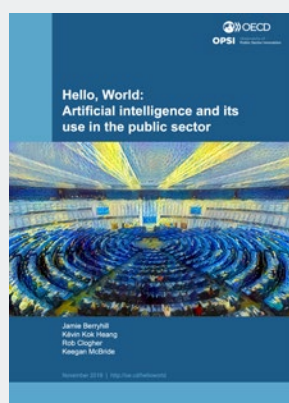
35 The OECD Principles for Open Government are a component of the OECD Recommendation of the Council on Open Government (<https://oe.cd/opengovrec>).

A number of governments have created central hubs to communicate consistent and trustworthy information. Many of these provide broad details and instructions, such as the Czech Republic's COVID-19 portal.³⁶ Others provide more tailored information, such as Nuevo León, Mexico's suite of digital tools, which provides regular status updates as well as self-assessment tools that tailor responses based on each user's context;³⁷ and Portugal's COVID-19 Dossier automation tool, which provides residents with tailored updates based on where they live.³⁸ In Spain, a special tab on the Presidency's web page provides up-to-date status information. Accurate and timely information from such sites can help to overcome misinformation. Some governments are taking even more explicit actions in this regard, such as Austria, where the Federal Chancellery has established a "digital crisis unit" to deal with the detection and correction of incorrect information about Covid-19.³⁹ Similarly, Spain has created a Permanent Commission to detect misinformation campaigns and to react to incidents and educate citizens on safe guidelines and how to detect hoaxes and fake news.⁴⁰

Communication portals like these vary in terms of innovation. Moving towards the more innovative spectrum, OPSI's colleagues in the OECD Digital Government and Open Data Unit have collaborated with New York University's GovLab to issue a call for evidence on the use of open government data (OGD) in response to COVID-19.⁴¹ Among other things,⁴² this call has highlighted the development or expansion of OGD programmes by government, such as Colombia's efforts to ensure open access to quality infection rates data.⁴³ Government OGD efforts often yield products for communicating important information to the public. For instance, many efforts involve the use of OGD to build public-facing dashboards. Examples include those in Ireland,⁴⁴ the European Commission,⁴⁵ Tokyo,⁴⁶ and Korea, which presents the current status of the COVID-19 epidemic at the national, provincial and municipal level.⁴⁷ Many of these solutions are open source and available for replication.

Perhaps even more innovative is governments' utilisation of emerging technologies such as artificial intelligence (AI), which is often dependent upon OGD, to provide tailored communications. An increasingly visible example of this approach is the use of chatbots to provide context-specific information and advice to the public. Specific examples include:

- **Dr Rosa (Serbia):**⁴⁸ Asks users a series of questions and determines the symptoms of the patient. Based on these, the user may be passed to a virtual office, where they are evaluated by professional doctors, who can make a professional determination and refer them to a hospital or even dispatch an ambulance.
- **SUVE (Estonia):** Developed as part of Hack the Crisis, this chatbot can understand slang and has been integrated into a number of government websites (see the case study on Hack the Crisis and Figure 4).
- **Hispabot-Covid19 (Spain):** Allows citizens to obtain immediate answers to common questions about the coronavirus, 24 hours a day, through WhatsApp.



Box 1: Artificial Intelligence (AI) for public sector innovation and COVID-19 response

The use of AI for public sector innovation is by no means limited to chatbots. In fact, the OECD recently issued *Hello, World: Artificial Intelligence and its Use in the Public Sector* (<https://oe.cd/helloworld>) to help government officials understand AI and navigate considerations specific to the public sector. The OECD has also created an AI Policy Observatory (<https://oecd.ai>), which has led the development of Principles on AI to support artificial intelligence that is innovative and trustworthy and that respects human rights and democratic values.

For additional details on AI for COVID-19 response, see *Using artificial intelligence to help combat COVID-19* (<https://oe.cd/covid-ai>).

36 <https://oe.cd/cz-covid>.

37 <https://oe.cd/mx-covid-site>.

38 <https://oe.cd/pt-covid-site>.

39 For a country-by-country listing of self-reported efforts to communicate science advice and combat misinformation, see <https://stiplab.github.io/Covid19/Q2.html>.

40 www.ccn-cert.cni.es/informes/informes-de-buenas-practicas-bp/3549-ccn-cert-bp-13-desinformacion-en-el-ciberespacio/file.html.

41 <https://oe.cd/ogd-covid19>.

42 OGD has the potential to aide COVID-19 response efforts in many ways. Beyond the topic of OGD-enabled communications, OGD can be re-used by third parties to enable scientific research and used by existing or new businesses (e.g. start-ups) to strengthen the innovation ecosystem. More details on how OGD can help respond to COVID-19 can be found on the OECD Digital Government and Open Data Unit's blog "Towards Digital States", <https://link.medium.com/wLeoPD3Rk7>.

43 <https://oe.cd/co-ogd>.

44 <https://oe.cd/ie-dash-board>.

45 <https://qap.ecdc.europa.eu/public/extensions/COVID-19/COVID-19.html>.

46 <https://oe.cd/tokyo-covid>.

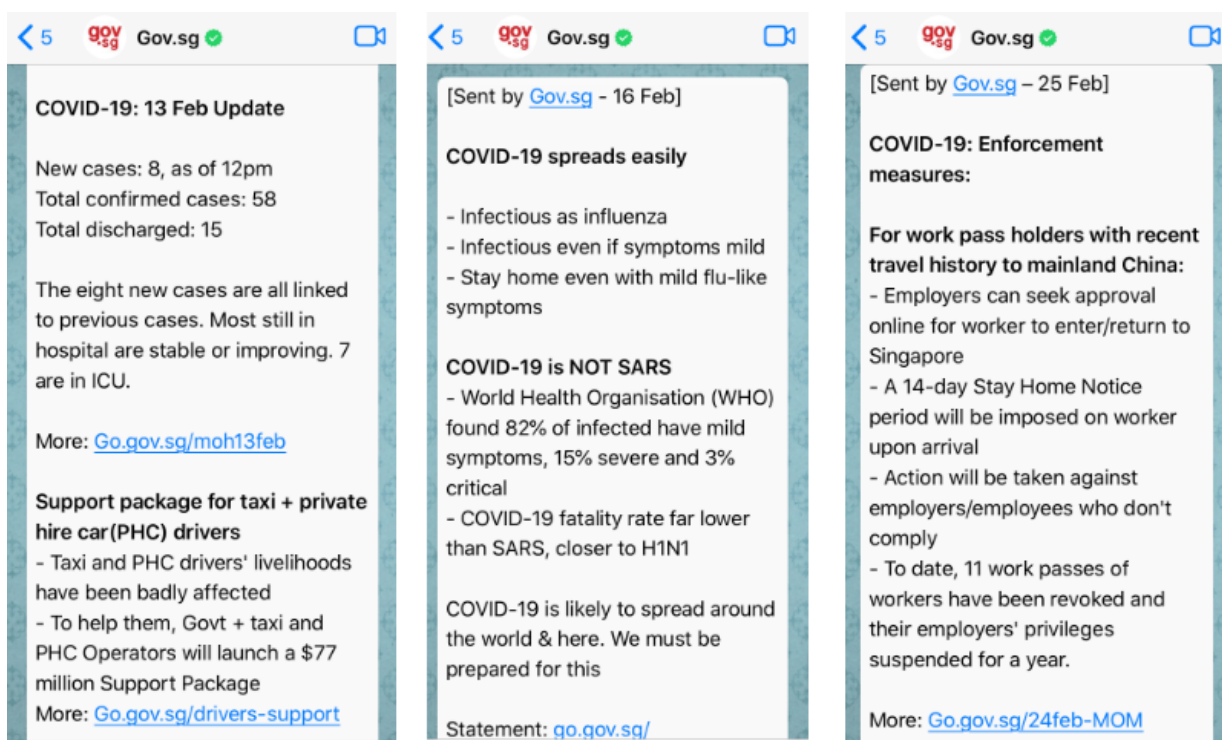
47 <http://ncov.mohw.go.kr/en>.

48 <https://oe.cd/dr-rosa>.

In developing communications strategies and solutions, governments have also recognised that it is not always necessary to create entirely new products. Often, innovation can take the form of leveraging existing channels in new ways. Making use of platforms already utilised by citizens, rather than expecting people to visit government platforms, helps to ease the burden. Spain, for example, communicates regularly through social media, and the government has worked to ensure that all official accounts are verified and thus seen as a source of trustworthy information.⁴⁹ A common strategy employed by governments is to use WhatsApp in new ways. For example, the Government of Singapore has provided daily COVID-19 updates through WhatsApp, winning praise from the World Health Organization (WHO) (Figure 5) (Basu, 2020), and also has set up a dedicated web page for clearing up misinformation and rumours.⁵⁰ Australia⁵¹ and the United Kingdom⁵² have created chatbots that help answer user questions through WhatsApp. The potential for WhatsApp as a key communications channel has been realised through a partnership with UNDP, UNICEF and WHO to create the WhatsApp Coronavirus Information Hub.⁵³ This platform seeks to combat misinformation and provide a trusted source of simple, actionable guidance for health workers, educators, community leaders, non-profits, local governments and local businesses.

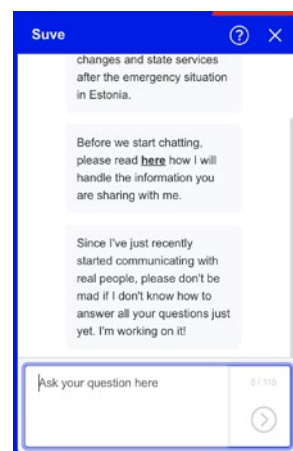
Digital channels have also functioned as key dissemination mechanisms for innovative communications campaigns. The New Zealand Police, for instance, published a series of humorous videos related to COVID-19 topics on YouTube, and also invited citizens to submit their own creative videos through the campaign “Creative Genius”.⁵⁴ Other campaigns have targeted groups such as children. The Government of Mexico, for example, created a social media-based cartoon superhero, Susana Distancia—a play on words meaning “keep your distance”—and launched a fan-art contest to alert people to the importance of adhering to social distancing measures (Figure 6).⁵⁵ Similarly, Portugal created the CoronaKids programme,⁵⁶ to inform children about the virus in a tailored way through specialised news, games, videos and activities.

Figure 5: WhatsApp COVID-19 updates from Singapore



Source: <https://Gov.sg>.

Figure 4: SUVE



Source: <https://eebot.ee/en/>

49 <https://twitter.com/saludpublicaes>.

50 www.gov.sg/article/covid-19-clarifications.

51 <https://oe.cd/aus-whatsapp>.

52 <https://oe.cd/uk-whatsapp>.

53 www.whatsapp.com/coronavirus.

54 <https://oe.cd/nz-police-vids>.

55 <https://coronavirus.gob.mx/susana-distancia>.

56 www.coronakids.pt.

Figure 6: Susana Distancia drawing contest fan art



Source: <https://twitter.com/RETROGOBLIN1/status/1245034347184480256>.

As can be seen from the previous sections, governments have pivoted rapidly to digital environments. However, effecting a digital transformation of government operations and services is not an easy task. Many governments have and continue to face challenges that have only been compounded by COVID-19 crisis. In many instances, action taken to enable and bring about digital transformation is more innovative than the end results. Some of these actions are being taken directly by the public sector, while others are being initiated by civil society and industry actors, with governments as partners.

When it comes to crisis response on the ground, OPSI and the MBRCGI have found that countries are enabling digital innovation and transformation to respond to the COVID-19 crisis by assembling dedicated teams and programmes:

- For example, the United States Digital Response (USDR) is a volunteer-led civic tech initiative that has recruited over 5 500 technologists from across the country to partner with state and local governments, in order to tackle digital challenges created by COVID-19 (see the case study on USDR in this report).
- Portugal has established a government Office for Digital Response to COVID-19,⁵⁷ which assesses and implements digital-based measures and ensures a coordinated response by involving public and private players. The government has also created a “Collaborative Work Plan”⁵⁸ that sets forth guidelines for public services in the context of the present state of emergency and includes 22 projects driven by multi-disciplinary teams on issues like promoting innovation and disseminating information.
- In the Czech Republic, tech companies and volunteers have joined forces to create Data Against COVID, an initiative to help the government address the present pandemic through modern technology, data analysis and effective communication with citizens and health care workers.⁵⁹

A number of bodies have also published guidance and created repositories of knowledge and resources to assist with digital innovation. For example, the UK civic tech community have developed the Coronavirus Tech Handbook,⁶⁰ a crowdsourced library of tools, services and resources relating to COVID-19 response. This rapidly evolving resource features contributions from thousands of experts, and includes a specific section geared to assisting governments. At the international level, the European Union has created the EU Digital Response to COVID-19,⁶¹ which provides users with access to a large resource database including open source software, websites and platforms useful for public administrations, businesses and citizens dealing with the ongoing crisis.

One area that would benefit from additional emphasis in the future is systems strategies for the near and medium-term. Most governments have not yet made this a focus for understandable reasons. As society moves towards recovery, developing a more systems-wide, strategic view of digital innovation could serve governments well.

⁵⁷ <https://oe.cd/pt-dr>.

⁵⁸ <https://oe.cd/pt-workplan>.

⁵⁹ <https://oe.cd/data-against-covid>, <https://covid19cz.cz>.

⁶⁰ <https://coronavirustechhandbook.com>.


⁶¹ <https://oe.cd/eu-dr>.

USDR United States Digital Response, USA

Recognising an opportunity to help sub-national governments cope with the wave of urgent demands provoked by the COVID-19 crisis, and noting willingness among civic-minded technologists to contribute their services, four leaders with significant government and private tech experience created the United States Digital Response (USDR) in March 2020.⁶² USDR is a non-partisan, volunteer-driven effort to match experienced pro-bono technologists from across the country with governments responding to COVID-19. The project rapidly snowballed, attracting more than 5 500 volunteers, and developing a start-up like recruitment pipeline and matchmaking process, contributing to over 100 high-impact projects around the country (Rafter, 2020). When governments need digital help, they can reach out to USDR and receive assistance within one day.

⁶² See the USDR website at www.usdigitalresponse.org and blog at <https://medium.com/u-s-digital-response>. USDR was founded by Cori Zarek of the Beeck Center for Social Impact and Innovation at Georgetown University; Jennifer Pahlka, the founder and former executive director of Code for America; Ryan Panchadsaram of Kleiner Perkins venture capital; and Raylene Yung, a recent fellow with the Aspen Institute's Tech Policy Hub and former product executive at Stripe and Facebook. Zarek, Pahlka, and Panchadsaram have all held the title of US Deputy Chief Technology Officer, and Yung serves as CEO of USDR.

⁶³ Unless otherwise cited, the details for this case study are taken from an interview with Cori Zarek and Elizabeth Robinson conducted with the USDR team on 19 May 2020.



“You’ve got to be able to deliver, and if the damn website doesn’t work, the public doesn’t think you’re doing your job.”

– Robin Carnahan, USDR core team volunteer, former Missouri Secretary of State and 18F sub-national lead (Beeck Center, 2020).

The problem

Government technology systems are often placed under strain by even routine demands. For state and local governments in the United States, unprecedented requests for vital services during the COVID-19 crisis have brought some of these systems to the brink of collapse. Citizens and residents are requesting services such as unemployment benefits and small business loans at rates as high as 10 000% above normal (Yung, 2020). Many of the systems that process these requests are decades old, built using programming languages like COBOL that few modern programmers can support. Furthermore, the underlying processes in many cases are designed for a paper-based world that simply cannot function adequately during this crisis. Press articles have reported consequences such as New Yorkers being forced to locate fax machines in the midst of the pandemic in order to file unemployment benefit claims. Governments may also lack the ability to launch new services at speed or handle new tasks such as analysis of virus tracking data. At the same time, entire governments have had to cease physical operations and migrate to a virtual environment for the very first time with little preparation. Without action to address these issues, the ability of governments to fulfil their missions and serve the public could be paralysed at a time when it has never been needed more.

An innovative solution

In just a few months, the co-founders and a core team of volunteers assembled USDR up as a completely volunteer-driven initiative that operates like a tech start-up. USDR operations centre around three core workstreams (Beeck Center, 2020):

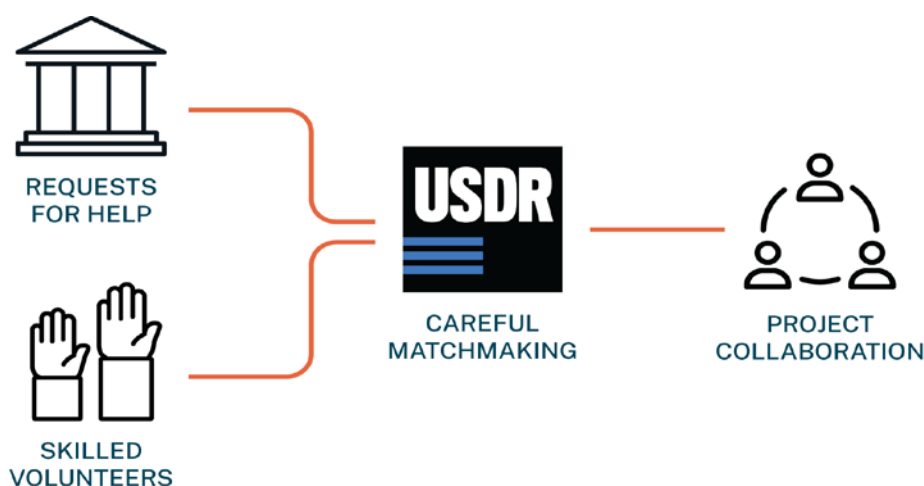
1. **Intake.** Volunteers complete a digital form outlining their skills and experience⁶⁴ and also commit to upholding the values of the USDR Volunteer Oath (see Box 2). Governments request assistance through a form that gathers details on their specific needs.⁶⁵ The USDR team works to understand the needs of each government and what skills and abilities its volunteers can contribute.
2. **Embed.** USDR uses the information gathered from the intake process to carefully match talented technologists with government project partners. The volunteers are effectively embedded into the government teams to tackle specific challenges. The work can take many forms, as building new solutions for a specific challenge, helping governments optimise existing solutions or processes, or providing them with consulting services (e.g. advice on contact tracing) (Shorenstein Center, 2020).
3. **Amplify.** In addition to embedding volunteers, USDR works to identify and raise awareness of existing tools and resources, and help governments adapt them to their own unique situations. For example, USDR has raised awareness and connected governments through Covid Act Now,⁶⁶ a multidisciplinary team of technologists, epidemiologists, health experts and public policy leaders, that have developed an open source model which aggregates data on confirmed cases, deaths and hospital bed capacity, and simulates future outcomes based on a variety of possible government interventions (e.g. local quarantine measures). (Beeck Center, 2020).

Box 2: USDR Volunteer Oath

- Do what is needed most—even if that is unglamorous.
- Always start by asking how I can help, before offering new ways of doing things.
- See what other projects, people, or leaders might be working in a related space—and consider how we can work together
- Ask “why” when I don’t understand, recognising that everyone’s ideas, skills and contributions have value.
- Listen more than I speak.
- Recognize the sensitivity of this time and work and to not speak about it publicly without permission.
- Update USDR of any changes to the status of my project and report any issues.
- Understand our mission, values, and development guidelines, agree to them yourself and help us all abide by them.
- Be a great communicator. Keep the USDR updated on your work, share your learnings proactively, identify ways we can work more effectively or have more impact, and ask for help when you need it.
- Contribute to and uphold an environment free of harassment and discrimination.

Source: www.usdigitalresponse.org/volunteeroath.

Figure 7: Overall USDR Concept



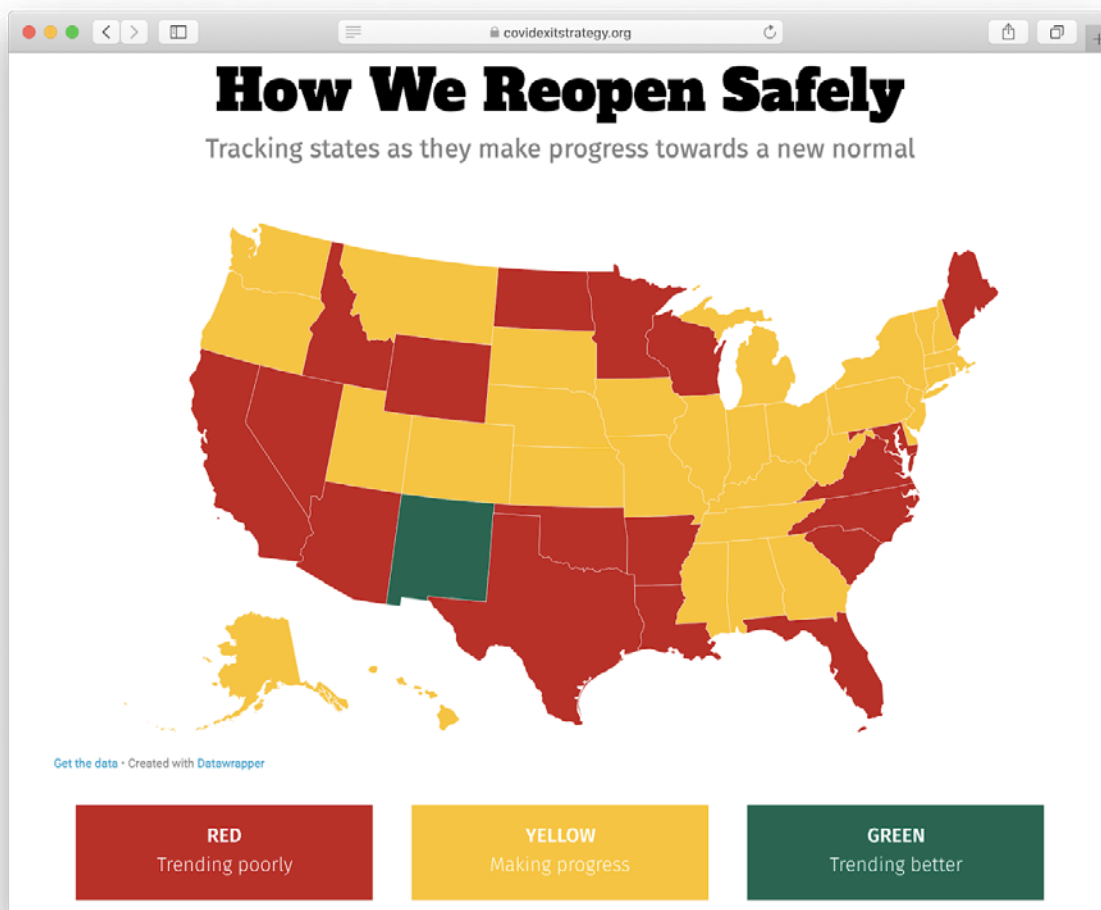
Source: USDR.

64 www.usdigitalresponse.org/volunteers.

65 www.usdigitalresponse.org/governments.

66 <https://covidactnow.org>. The open source model is available at <https://github.com/covid-projections/covid-data-model>.

Figure 8: COVID Exit Strategy



Source: www.covidexitstrategy.org.

In order to surface government needs and scale, USDR built connection points with the National Governors Association,⁶⁷ the National Association of Counties⁶⁸ and the Bloomberg What Works Cities network.⁶⁹ On the volunteer side, USDR has established a dedicated central team focused on matchmaking and volunteer experience. The team interviews each potential match volunteer to ensure that they are a good fit before connecting them with government. The team also takes diversity and inclusivity into account and makes a concerted effort to recruit and promote volunteers who share characteristics with the people they hope to serve (Beeck Center, 2020). These steps ensure a high bar for quality (Shorenstein Center, 2020). A significant number of volunteers are temporarily out of work or retired, and contribute time during nights and weekends, with many helping full time (Bloomberg Cities, 2020).

Over time, USDR has found that the assistance governments need comes in cycles. Initially, governments needed help with communications and delivering crucial information to their communities (e.g. whether schools were open). To aid them in this, USDR produced a style guide and sample website for easy duplication which many cities then used to create their COVID-19 websites.⁷⁰ Governments also needed help in shifting to telework, so USDR helped them set up VPNs and digitalise paper forms. A second cycle revolved around healthcare data and information needs, followed by support for benefit claims processes. As the number of cases fall and communities start to emerge from confinement, many governments are looking towards recovery-oriented projects (Bloomberg Cities, 2020).

⁶⁷ www.nga.org.

⁶⁸ www.naco.org.

⁶⁹ <https://whatworkscities.bloomberg.org>.

⁷⁰ This resource is accessible at <https://covid-websites.usdigitalresponse.org>.

These cycles of demand have also changed the way in which USDR recruits volunteers. USDR focused first on recruiting and embedding programmers and engineers to help governments tackle immediate critical needs. These encompassed many modern frameworks and languages, as well as those that are older and more difficult to service. For instance, over 300 volunteers have experience with COBOL and other mainframe systems (Rafter, 2020). Over time, the group has expanded its activities to cover data analytics, design, communications and product management, and has developed subject-specific expertise in healthcare and supply chain management (Beeck Center, 2020; GermanMarshallFund, 2020). USDR is also striving to build a shared repository of best practices, digital solutions and library sets, as well as other knowledge to enable any government to learn from successful actions elsewhere (Beeck Center, 2020).

It is difficult to develop a long-term strategic focus in a time of crisis. Moving forward, USDR leaders plan to take each day as it comes, respond to demands as they arise, and build common solutions and linkages where possible. Increased efforts may go to contract tracing in the near term, with USDR recently joining the TCN Coalition, a global coalition for privacy-first digital contact-tracing protocols to fight COVID-19.⁷¹ USDR has also built an open source Contact Tracing Playbook⁷² to help local governments implement contact tracing in their communities. Efforts geared towards recovery, including partnering with other organisations, are also being ramped up⁷³ to create the COVID Exit Strategy (Figure 8).⁷⁴ This aims to help governments reopen safely by aggregating publicly available information to track a state's progress towards reduction in COVID-19 symptoms and cases, health system readiness and increased testing (Figure X).

In the longer term, the co-founders hope that at some point the organisation will no longer be needed, because the virus is under control, governments, economies and society have successfully grappled with the COVID-19 crisis (Govcast, 2020), and governments have built solid yet adaptable digital foundations to navigate current and future challenges. As co-founder Cori Zarek explained in an interview with OPSI, "we should 100% be trying to put ourselves out of business". Regardless of its future trajectory, USDR remains focused on building and making available all its solutions and guidance in open source format to maximise impact, and to allow them to live on as content, tools and code, even if the organisation itself is no longer around (Govcast, 2020).

Novelty

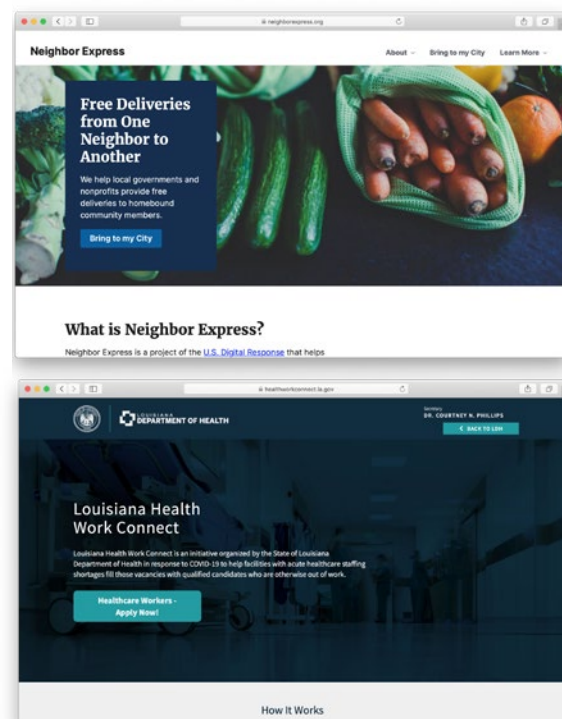
The novelty of USDR lies in its existence as a completely volunteer-run initiative, and in its ability to rapidly understand, build, execute and scale. USDR is also unique in its deeply integrated public-private experience and its diverse mix of skillsets and backgrounds.

Results and impact

USDR has recruited over 5 500 volunteers from across the United States. Over 250 of these have been deployed to government teams to tackle over 100 complex projects in 24 states plus the District of Columbia (DC), such as those described below.⁷⁵

- **Neighbor Express** –helping the homebound get meals. USDR worked with the city of Concord, California to create a volunteer-matching system that connects community volunteers with vulnerable populations for groceries, deliveries and check-ins. The system runs on open source software and has been duplicated by several other cities.⁷⁶
- **Matching hospital staffing shortages with qualified workers.** The Louisiana Department of Health launched Louisiana Health Work Connect⁷⁷ with start-to-finish support from USDR volunteers. The programme connects facilities with healthcare staffing shortages to qualified candidates who are otherwise out of work (USDR, 2020).

Figure 9: Neighbor Express and Louisiana Health Work Connect screenshots



Source: <https://neighborexpress.org>, <https://healthworkconnect.la.gov>.

71 <https://tcn-coalition.org>.

72 <https://contacttracingplaybook.org>.

73 United States of Care (<https://unitedstatesofcare.org>), Duke-Margolis Health Policy Center (<https://healthpolicy.duke.edu>) and Resolve to Save Lives (<https://resolvetosavelives.org>).

74 www.covidexitstrategy.org.

75 See www.usdigitalresponse.org/projects for more details on USDR projects.

76 This solution is located at <https://neighborexpress.org>. The site also provides details for communities wishing to duplicate the system.

77 <https://healthworkconnect.la.gov>.

User perspective

USDR's users are government partners who have benefited from the support provided by USDR. Testimonials provided by leaders from governments representing the projects listed above help recount how USDR has helped fill critical gaps during a difficult time (USDR, 2020):

- "The next few weeks in America are going to be rough, and fantastic partners like you...are why people in our cities are going to pull through." (Mayor Tim McGallian, Concord, CA)
- "The volunteers' technical expertise and assistance from start to finish is helping our state fight back against COVID-19 by helping us support getting medical services to Louisiana residents" (Louisiana Department of Health, 2020). (Dr Alex Billioux, Assistant Secretary of the Louisiana Office of Public Health)

Challenges and lessons learned

A key challenge is that the immense interest shown by volunteers has outpaced USDR's capacity to match them with projects. USDR is seeking to solve this issue by proactively seeking governments in need of assistance (Beeck Center, 2020), as well as creating more outlets to enable volunteers to assist with information sharing and identifying additional opportunities where they can help.

USDR leaders and volunteers have identified several lessons learned and key factors that have allowed the organisation to succeed:

- The core USDR team consists of about 50% people with experience in government, and 50% people with private sector tech experience (some have both). This allows USDR to build and scale rapidly while possessing a deep empathy and understanding of government systems, needs and challenges (Beeck Center, 2020).
- Building strong relationships is key. Optimally, these would exist prior to a crisis, as the ability to draw on existing relationships and networks has helped USDR to scale quickly. During a crisis, building relationships can be more difficult; however, trust can be gained very quickly with sufficient effort and demonstrated results (Shorenstein Center, 2020).
- It is critical to document actions and results clearly and succinctly in order to help make them understandable and repeatable, and to ensure that progress is sustainable once the intervention is over.
- In a crisis, it is important to focus on what is needed right now. It is not the time to push for instituting longer-lasting or structural change. Such change can (and should) come later after urgent needs have been addressed and trust has been established (Shorenstein Center, 2020).
- Someone somewhere has probably solved the problem before. It is important to step back and think about who these people might be, how to find them and how to work with them (Shorenstein Center, 2020).

Replicability


USDR incorporates two elements of replicability. First, the concept and structure of USDR itself can be replicated by others countries. Civic tech leaders in Mexico have consulted with USDR on replicating the concept for its Brigada Digital MX,⁷⁸ and USDR has advised on a similar concept in Digital Response Germany.⁷⁹ The USDR team are also looking into developing guidance that could help others to replicate and adapt the USDR model. Second, the products and solutions developed by USDR have been made available as open source to facilitate replicability. As stated by USDR co-founder Cori Zarek, "Our goal is for our work to be findable and replicable, so anyone anywhere can come across it and use it. And we hope they do... We really believe that by doing this openly we can help more people in more places, that's ultimately the goal here" (Queram, 2020).

⁷⁸ www.facebook.com/bridigitalmx.

⁷⁹ <https://digital-response.de/en>.

Seeking Bottom-Up Solutions and Insights





“Every new idea is itself a recombination of prior ideas. It’s like standing on shoulders of giants. Almost never does a powerful new idea come out of nowhere without precedent or antecedent.”

– Steve Jürvetson, Board member of SpaceX and Tesla, speaking about the Global Hack (see the case study at the end of this section)

From the start of the COVID-19 crisis, governments have made efforts to pursue all possible paths to identifying innovative, game-changing actions. Recognising that they do not have all the answers, many governments have built conduits to enable citizens and businesses to provide ideas and solutions. These efforts involve mechanisms that convene individuals at both local and global scales to collaborate over solutions, as well as issue calls to action for start-ups and other businesses to devise and fast-track useful products.⁸² Importantly, governments are also seeking bottom-up insights and stories in order to better understand the challenges and needs of their people.

Harnessing collective action: Hacking and collective intelligence

One of the most immediate actions taken by governments to source bottom-up solutions has been to organise and participate in hackathons. Estonia's Hack the Crisis, which was duplicated around the world and led to the Global Hack, is perhaps the most rapid, innovative illustration of this approach (see the case study at the end of this section). Hackathons have received some criticism in recent years: critics have accused them of being overrated and possibly bad for innovation, arguing that solutions created in a vacuum are not sustainable, and that the resulting ideas and products cannot take into account the context in which they will be applied (Sastry and Penn, 2015). Hack the Crisis and the Global Hack have taken steps to mitigate these limitations, and several of the resulting solutions have been integrated into government services. For example, hackers created the initial concept for MASC, a digital solution for monitoring PPE stock and demand in hospitals, which is now used by all hospitals in Estonia.⁸³ Latvia's version, HackForce, resulted in Shield48, a design and plan to manufacture and supply face shields to medical professionals during the COVID-19 pandemic (see Figure 10).⁸⁴ Shield48 has already manufactured 10 000 face shields for Latvian state hospitals.

Figure 10: Shield48 face shield

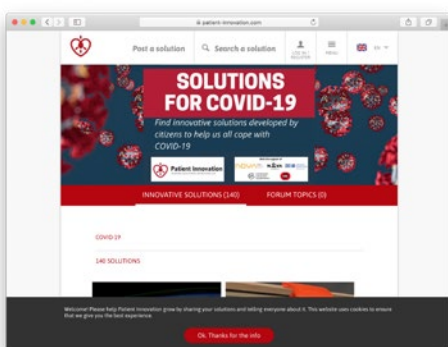


Source: <https://shield48.eu>

Governments have also used crowdsourcing and collective intelligence principles to activate citizens and residents as active participants in COVID-19 response. For example, the Indonesian start-up Qlue has built Moving Indonesia as a citizen reporting tool to serve as a bridge between local governments and their public.⁸⁵ The social media app allows users to report problems (e.g. dangerous levels of crowding, full hospitals) directly to the city government, and to share information with their neighbours.

Local government officials and others can access results on a public dashboard to help guide both governmental and personal decisions. The underlying system is linked to the system used by the National Disaster Management, allowing it to assist in coordinating tasks at the national level.

Figure 11: Patient Innovation platform



Source: <https://patient-innovation.com/condition/covid-19>.

OPSI has built its Innovative COVID-19 Response Tracker, in part, to help amplify and raise the visibility of bottom-up efforts such as these. Ensuring the visibility of such solutions helps to identify those that can be most impactful and reduces the risk that good ideas fizzle out. Portugal has implemented this approach at the national level through its Patient Innovation platform, which shares solutions created by citizens (Figure 11).⁸⁶ Spain is also developing an observatory or best practices database. Such efforts could assist other countries in making their own bottom-up efforts visible.

83 <https://oe.cd/masc>.

84 <https://oe.cd/shield48>.

85 <https://oe.cd/movingindonesia>.

86 <https://oe.cd/pt-citizen-innovation>.

Calls to action for the private sector and academia

In addition to fostering grassroots efforts, governments have targeted the private sector, including more established companies, in order to identify new or existing solutions that could be scaled to meet the rapidly changing demands brought about by COVID-19. The most prominent theme in this regard involves challenges and prizes to catalyse research and development (R&D) efforts to tackle COVID-19 challenges. One major initiative is the European Commission's EUR 164 million call for bottom-up solutions,⁸⁷ which solicited start-ups and small and medium-sized enterprises to devise technologies and innovations to help treat, test and monitor aspects of the Coronavirus outbreak.

Governments have also developed similar challenge-oriented programmes at the national level. For example:

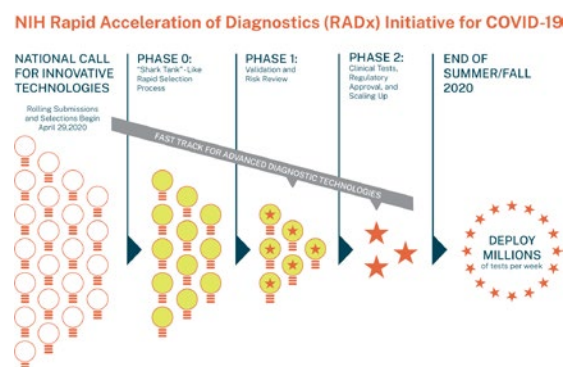
- The Government of Greece launched the #GreeceVsVirus programme to facilitate digital innovation to combat COVID-19.⁸⁸ It includes an ideas challenge to surface concepts in support the health system, and mechanisms to accelerate the scaling of existing technologies.
- The US National Institutes of Health (NIH) launched a USD 500 million challenge to develop rapid testing technology,⁸⁹ in a bid to scale up testing across the country. The technologies would undergo a multi-phase selection process to locate the best rapid test for deployment at home or in a care setting, with finalists matched with technical and business experts to accelerate commercialization (Figure 12).
- The US also launched the COVID-19 Open Research Dataset Challenge (CORD-19),⁹⁰ which offers cash prizes for the best responses to critical research questions examinable using a machine-readable data set of 44 000 scholarly articles (OECD, 2020c).
- Ireland launched a rapid response innovation fund, an agile and adaptive initiative to support development of innovative solutions that can have a rapid impact on the COVID-19 crisis.⁹¹
- France's Ministry of the Armed Forces launched a EUR 10 million call for projects to help scale technologies that are already sufficiently mature in areas such as personal protection, automated sanitation and cleaning, virus detection and diagnosis, and mental health.⁹²
- Italy's Innova for Italy programme supports exploration into technologies useful for monitoring and containing the virus, and

invites individuals and teams from all sectors to respond to its specific, short-term calls to action.⁹³

- The Government of India launched a "Solutions Challenge" where citizens could share their stories and pitch ideas that, if selected, would be funded and scaled up within government.⁹⁴

If considering prizes and challenges, governments should keep in mind that recent empirical work shows that winner-takes-all compensation schemes generate significantly more novel innovations than those that offer shared compensation among multiple winners (OECD, 2020c).

Figure 12: Multi-phase process for scaling up testing efforts



Source: www.nih.gov/news-events/news-releases/nih-mobilizes-national-innovation-initiative-covid-19-diagnostics.

Finally, while much emphasis has been placed on private sector activities, a number of governments are making a push for innovative research in academic fields. Austria, for example, has developed a EUR 23 million research incentives package to fund research into using AI to develop medicines and vaccines.⁹⁵ Portugal, through public-private collaboration, has created the Doctorates 4 COVID-19 programme, which aims to grant 50 PhD scholarships and coronavirus-related research projects to help fight COVID-19 and future pandemics.⁹⁶ These initiatives may represent a slower track than private sector efforts to accelerate technologies, but they have major potential to produce innovative results with a broad impact.

⁸⁷ https://ec.europa.eu/info/news/startups-and-smes-innovative-solutions-welcome-2020-mar-13_en.

⁸⁸ <https://oe.cd/GreeceVsVirus>, <https://twitter.com/hashtag/GreeceVsVirus>.

⁸⁹ <https://oe.cd/NIH-testing-challenge>.

⁹⁰ www.kaggle.com/allen-institute-for-ai/CORD-19-research-challenge.

⁹¹ www.sfi.ie/funding/funding-calls/covid19-rapid-response.

⁹² www.defense.gouv.fr/aid/appels-a-projets/appel-a-projets-lutte-covid-19.

⁹³ <https://innovazione.gov.it/innova-per-l-Italia-la-tecnologia-e-l-innovazione-in-campo-contro-l-emergenza-covid-19>.

⁹⁴ <https://oe.cd/in-solutions>.

⁹⁵ <https://oe.cd/austria-covid-ai>.

⁹⁶ <https://oe.cd/doctorates4covid>.

Box 3: OECD best practices for prizes and challenges

- Establish a spectrum of innovation prizes across key topics relevant to the COVID-19 response, and create new prizes as challenges emerge.
- Design innovation prizes to emphasise information sharing. If multiple government agencies are deploying prizes that target similar problems, the merits of pooling resources could be assessed.
- Provide additional funding to help elicit and develop certain types of proposals (e.g. those requiring costly prototypes).
- Connect to open-source projects to assess how projects might align with government priorities.
- Diffuse information about open source projects and offer strategic direction where relevant.

Source: <https://oe.cd/covid-crowdsourcing>.

Converting insights into action

As can be seen in this section, governments have created a number of initiatives to enable bottom-up innovation and change. However, citizens, residents and businesses do not need to compete in hackathons and challenges in order to make a contribution. Sometimes, simply telling their story can be enough. One of the most innovative examples that OPSI identified is the Our Tomorrows-COVID-19 Module, a cross-sector collaboration created by the US-based Kansas Children's Cabinet and Trust Fund.⁹⁷ The programme establishes a rapid feedback loop for citizens to share their experiences with COVID-19 and the impact it has had on their families. The use of an easy-to-understand storytelling canvas helps to guide these conversations (Figure 13). Stories that are shared then contribute to a state-wide Story Bank. State-level decision-makers and community organisations across Kansas may access the Story Bank, as well as analysis provided by the Our Tomorrows team, to craft intervention strategies and respond rapidly to virus-related developments. Our Tomorrows seeks to help governments monitor

Figure 13: Our Tomorrows COVID-19 canvas

Drag the icons onto the continuum where it best fits the experience you shared.
If an icon doesn't apply to the experience, you may leave it where it is.



continuously evolving conditions in communities through the lens of citizen experiences, enabling them to be more responsive and responsible.

Finland has also been working to uncover insights to enable change. The country's Lockdown Dialogues⁹⁸ offer citizens and communities the possibility to engage in constructive discussions during the lockdown. All citizens are invited to participate to ensure diversity, and the discussions are structured around two key questions: 1) 'What are you worried about at present?', and 2) 'What makes you feel hopeful or confident at the moment?'. The dialogues help to form a comprehensive view of how different communities are experiencing the COVID-19 crisis, and can be used by governments and civil society organisations to craft tailored responses.

These types of actions demonstrate that governments have recognised the importance of empathy and of gaining a deep understanding of the needs of their people in this time of crisis. This understanding can prompt solutions and initiatives, both bottom-up and top-down, that are oriented to answer the needs, fears and expectations of citizens, residents and companies.

⁹⁷ See <https://oe.cd/our-tomorrows-covid> for more details on this initiative. The underlying framework and methodology for the COVID-19 Module is the innovative "Our Tomorrow" community sensemaking approach. For more information, see <https://oe.cd/our-tomorrows>.

⁹⁸ <https://oe.cd/lockdown-dialogues>.

Hack the Crisis, Estonia → Global

Accelerate Estonia,⁹⁹ the Government of Estonia's project in agile innovation to tackle wicked problems, partnered with the Estonian hackathon-focused non-profit Garage48¹⁰⁰ to hold Hack the Crisis, a 48-hour hackathon dedicated to building solutions to help the country grapple with the COVID-19 crisis. Over 1 300 civic hackers participated in the event, resulting in 27 teams each working to build out projects, many of which have since been integrated into government operations. The impact of Hack the Crisis did not end there; the event has been replicated in many other countries and has spawned the worldwide movement, the Global Hack.¹⁰¹

⁹⁹ See <https://accelerateestonia.ee/en> and <https://oe.cd/accelerate-estonia>.

¹⁰⁰ <http://garage48.org>.

¹⁰¹ Unless otherwise cited, details for this case study are taken from an interview with Mikk Vainik, Head of Accelerate Estonia, conducted on 20 May 2020.

“In difficult times we have always two options: remain seated when the ground is burning or start searching for solutions. We chose the last option!”

–Viljar Lubi, Deputy Secretary General for Economic Development, Estonia (e-Estonia, 2020)

The problem

The challenges produced by the COVID-19 crisis constituted a shock to governments worldwide. Estonia has faced rapidly increase infection rates, especially in certain hotspots. Even though the country is often regarded as having the most advanced digital government in the world, it had not anticipated the possibility that physical operations could grind to a halt. The government acknowledged that it did not have all the answers, and that new ideas and collaboration were essential to respond to the crisis as effectively as possible.

An innovative solution

As the infection rate began to increase rapidly, Estonian Minister for Foreign Trade and ICT, Kaimar Karu issued a call to action to “use this crisis to emerge stronger”, shortly before the Estonian Prime Minister declared a national state of emergency.¹⁰² On 13 May 2020, the day after the call to action, the tech community proposed the idea of a national Hack the Crisis virtual event, which the government immediately accepted and took action to make a reality (Wolcott, 2020).

Accelerate Estonia was charged with leading these efforts. Sometimes described as a “moonshot lab” (Boma Global, 2020), the government organisation is an innovation in itself, serving as platform for all Estonian ministries and sectors to join forces and design and execute agile projects. Accelerate Estonia partnered with Estonian non-profit Garage48 to kick off the virtual hackathon just a few hours after it was approved.¹⁰³ The hackathon was set up to last a total of 48 hours. After the launch at 2:30 pm events moved very rapidly (Boma Global, 2020), and by 6:00 pm over 650 people had generated 80 ideas for discussion. That evening, over 30 teams had begun working to refine and build out these ideas, and by the end of the hackathon two days later, 96 ideas had been proposed by over 1 000 participants from more than 20 countries (Hack the Crisis, 2020).

Functionally, the hackathon took place on a dedicated Slack channel,¹⁰⁴ with ideas posted on Guaana,¹⁰⁵ an Estonian start-up community platform for innovation and research challenges. The government put on the table a cash prize of EUR 5 000 for each of the top five ideas to help the teams behind them further develop the concepts. Start-ups also contributed support packages, such as co-working spaces providing resources for the winners (Hack the Crisis, 2020). At the end of the event, 27 teams were formed to continue building out ideas.¹⁰⁶ Eight of these are now being actively used in government (GermanMarshallFund, 2020). Examples of some of these include:

¹⁰² <https://news.err.ee/1063224/estonian-government-declares-emergency-situation-against-coronavirus>.

¹⁰³ <https://accelerateestonia.ee/en/hackathon>.

¹⁰⁴ Slack (<https://slack.com>) is a propriety messaging and collaboration platform.

¹⁰⁵ See www.guaana.com/challenges/d2PibqzwsvPqYQ4ED/results/9okG4Qqz82XugNZJ5 for all of the ideas proposed.

¹⁰⁶ See <https://accelerateestonia.ee/en/hack-the-crisis> for descriptions of the 27 ideas.

- **SUVE.** This automated AI-enabled chatbot can answer questions from the public related to COVID-19 (ERR News, 2020).¹⁰⁷ SUVE understands slang and can provide answers in multiple languages, and is now embedded in many government websites (GermanMarshallFund, 2020).
- **Database for medically trained volunteers.** This database has the ability to help hospitals find and manage people

with suitable competencies and call them to action (e.g. in case of a shortage).

- **Share Force One.**¹⁰⁸ This innovation brings together individuals unemployed during the crisis (e.g. restaurant and cinema employees) with businesses who need staff for temporary work exchanges. Share Force One helps to prevent layoffs by finding new temporary work for the staff of businesses affected by the crisis and its associated lockdowns.

Figure 14: Share Force One team



Source: <https://garage48.org/blog/fighting-the-covid-19-pandemic-with-the-power-of-community>.

The success of Hack the Crisis in Estonia and its significant following on Twitter through #HacktheCrisis¹⁰⁹ sparked a global movement replicating the structure and approach around the world. More than 60 countries have held their own version of Hack the Crisis (GermanMarshallFund, 2020), including Austria,¹¹⁰ Denmark,¹¹¹ Finland,¹¹² India,¹¹³ Nigeria¹¹⁴ and Norway,¹¹⁵ among many others (Figure 15). The original teams from Accelerate Estonia and Garage48 were involved in many of these events, and have provided support and guidance to make them a success, including by:

- maintaining a website of Hack the Crisis hackathons around the world¹¹⁶
- developing guidance on setting up similar hackathons, which can be iterated on by the community¹¹⁷
- organising an open global Slack community where people can collaborate and seek guidance from organisers.¹¹⁸

Following the success of the national Hack the Crisis events, the organisers conceived of a global event focusing on broader issues: the Global Hack.¹¹⁹ Partnerships were established with the European Commission, New America, the United Nations and the World Bank¹²⁰, and companies including Facebook, Slack and Zoom, with the aim of holding a 48-hour worldwide hackathon on 9-12 April 2020 (GermanMarshallFund, 2020). The core organising team grew in size from six to 40, and assembled EUR 200 000 in prize money for the top ideas. The Global Hack adopted the same structure as the Hack the Crisis events, bringing together 12 000 participants from 98 countries, who were largely confined to their homes (ECH Alliance, 2020).

¹⁰⁷ <https://eebot.ee>.

¹⁰⁸ <https://shareforceone.ee/en>.

¹⁰⁹ <https://twitter.com/hashtag/hackthecrisis>.

¹¹⁰ <https://oe.cd/hack-at>.

¹¹¹ <https://oe.cd/hack-dk>.

¹¹² <https://oe.cd/hack-fi>.

¹¹³ www.mygov.in/task/hack-crisis-%E2%80%93-india-online-hackathon.

¹¹⁴ <https://hackthecrisisng.org>.

¹¹⁵ <https://oe.cd/hack-no>.

¹¹⁶ <http://garage48.org/hackthecrisis>.

¹¹⁷ <https://docs.google.com/document/d/1MzjbHEWJOHB8G5cSitiS0mqCN8F9f01wDBVmdaR31yA>.

¹¹⁸ https://join.slack.com/t/hackthecrisisglobal/shared_invite/zt-dzficqed--QfaZKBK_pJ3l-xyr68f8w.

¹¹⁹ <https://theglobalhack.com>, <https://oecd-opsi.org/globalhack>.

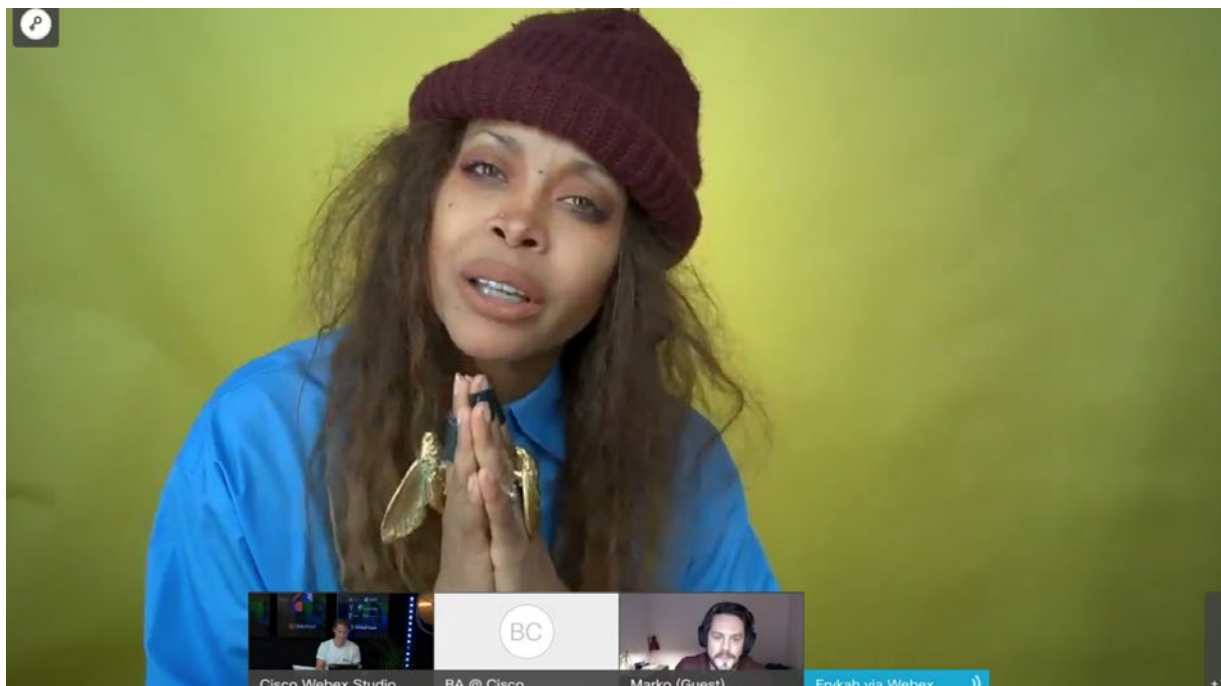
¹²⁰ <https://ec.europa.eu/digital-single-market/en/news/european-commission-supports-global-hack-global-tech-movement-combat-coronavirus>.

Figure 15: 67 Hack the Crisis hackathons around the world



Source: <https://garage48.org/blog/fighting-the-covid-19-pandemic-with-the-power-of-community>.

Figure 16: Erykah Badu Q&A session



Source: www.facebook.com/theglobalhack/videos/-erykah-badu-qa-concert/631946054031027.

The Global Hack's private sector partners also mobilised their networks and connections for the cause. For example, Marko Russiver, the founder of Guaana¹²¹ and long-term collaborator with Accelerate Estonia helped persuade R&B singer Erykah Badu—who participated as one of the hackers herself—to host a live Q&A session¹²² and give a surprise concert for her fellow hackers.¹²³

A number of functional products emerged from the Global Hack which are being further developed. Examples include:

- **SunCrafter (overall winner):**¹²⁴ Developed by a Berlin-based start-up, this contactless disinfecting station uses UV lamps to safely eliminate bacteria on human hands in under 20 seconds. The stations are designed to be used in areas where normal sanitation practices may be difficult, and are powered using “upcycled” decommissioned solar panels (see Figure 17).
- **Act on Crisis:**¹²⁵ Developed by a team from five countries, this solution helps those struggling during times of confinement by providing video-call emotional support from mental health professionals, matched based on their specific needs and cultural background.

¹²¹ www.guaana.com.

¹²² www.facebook.com/theglobalhack/videos/-erykah-badu-qa-concert/631946054031027.

¹²³ www.facebook.com/theglobalhack/videos/557715564853078.

¹²⁴ <https://suncrafter.org/en>, www.youtube.com/watch?v=8172hcxn724.

¹²⁵ www.youtube.com/watch?v=T1KJSdffOys.

Organisers from Hack the Crisis and the Global Hack are taking steps to ensure that these events continue to advance and make an impact. A non-profit association is being formed to help carry out ongoing COVID-19 work, while structures and capacities are being put in place to enable similar hackathons to be quickly ramped-up for other and future issues (GermanMarshallFund, 2020). Additionally, a “Global Matchathon” has been organised to help match hackers from Hack the Crisis events and the Global Hack with potential investors, partners and policy leaders, in order to connect talents, build out solutions and determine “#whatnow”.¹²⁶

Novelty

Hack the Crisis and the Global Hack represent a remarkable shift in terms of the ability of government, the tech community and citizens to mobilise collectively in the face of crisis. The innovation also resulted in the diffusion of ideas and the replication of those that work. The speed with which this occurred and the number of successful replications is unprecedented.

Results and impact

Together, Hack the Crisis events and the Global Hack have assembled over 200 000 participants who are collectively responsible for developing hundreds of ideas and

solutions with potential to make a difference in people's lives. Some solutions from the original Hack the Crisis are already in place and providing support to people.

Mikk Vainik from Accelerate Estonia told OPSI that the most significant impacts are yet to come. Thousands of teams are now working to resolve the crisis or have redesigned their business models as a result of the pandemic. This evolving situation will have major economic impacts moving into the future that may not be seen for months or even a few years. In some locations, private sector companies have set up boot camps to accelerate this work.

Challenges and lessons learned

Although the events have been a success, a number of challenges have provided useful lessons. One such challenge has been finding ways to identify and understand the key problems in need of a solution. During the crisis, those on the front lines, such as emergency services, are overloaded, and it can be difficult to understand what they need most and to demonstrate that a hackathon can provide assistance. To help remedy this issue, Accelerate Estonia worked to connect hackers with government response teams from the Ministries of Economic Affairs and Social Affairs via Slack channels, who could provide insights into the urgent needs of the people on the ground.

Figure 17: SunCrafter prototype



Source: SunCrafter (<https://suncrafter.org>).

Another challenge is implementation. Hackathons spawn many great ideas but a common criticism is that they often do not result in long-lasting products or change (Boma Global, 2020). To ensure that Hack the Crisis and the Global Hack do not follow this trend, organisers have identified the following key lessons (GermanMarshallFund, 2020):

- Keep fostering the community and share learning through available channels (e.g. the Hack the Crisis Slack).
- Ensure that relevant stakeholders are on board from the very beginning. Have partners aligned early on and include larger players who can help scale solutions down the line. The latter point also emphasised in a recent Forbes article (Wolcott, 2020).
- Find ways to broaden the functionality of solutions, one example being the embedding of the SUVE chatbot throughout many government websites as a new method of public communications.
- Set the expectation that long-term solutions are great, but that not every solution needs to change the world. Sometimes, good solutions may serve only an immediate or one-time need, or may never be used. For example, the database for medically trained volunteers mentioned above has never been used, but is there in case of need.

Those involved with Hack the Crisis in Estonia have identified a number of success factors (Boma Global, 2020). The backing of a solid organisation, Accelerate Estonia, proved essential to making the initial structure and the event a success. Perhaps most importantly, existing communities, networks and connection points allowed the events to be formed, held and scaled rapidly. After the events, these communities facilitate the ongoing development of ideas and products to maximise potential for impact.

As many public sector hackathons rely on data to build functional products, the availability of open government data (OGD) was also an important factor. However, there were also challenges associated with OGD. There were no processes in place to rapidly open up as yet unavailable data, while some of the available data had quality issues which made them difficult to use. The Government of Estonia has worked to overcome these issues for the future, but these limitations underscored the importance of robust and responsive open government data programmes.¹²⁷

Mikk Vainik also provided several key take-aways in his interview with OPSI:

- Inspirational champions are important for the success of the effort. These can be the President or other senior government leaders, major investors and even celebrities.
- A strong relationship between government and the private sector was important for getting Hack the Crisis off the ground and for scaling innovations.
- During a hackathon, it is important to have mentors for teams and to build in one-on-one progress checkpoints; otherwise it is difficult to identify teams that may be struggling.
- The core team organising and managing the hackathon should be small (four to five people). Otherwise, information flows break down and decision-making responsibility becomes unclear.
- Finally, organising hackathons of this kind is not easy. The process involves a lot of stress both for the teams and for government. Real investment in time and energy is crucial. The event should not be organised to gain credit or glamour. However, when done right the results can be very rewarding, and teams can emerge from the process with a better understanding of the public sector and exciting new business models.

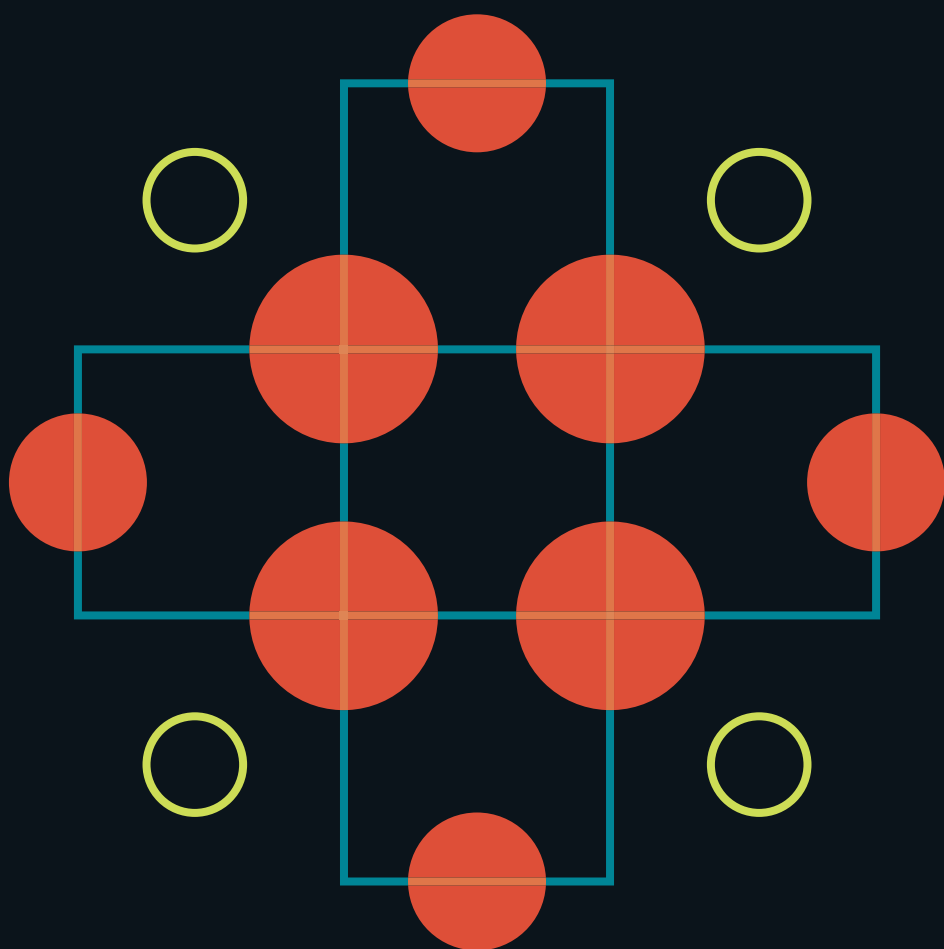
Replicability

As can be seen from the discussion in this case study, Hack the Crisis and the Global Hack have proven themselves to be completely replicable and adaptable to each government's unique culture and context. Those interested in replicating the concept can start by reviewing the instructions developed by Accelerate Estonia and Garage48.¹²⁸

¹²⁷ The OECD's Digital Government and Open Data Unit provides extensive analysis and guidance related to OGD at <https://oe.cd/ogd>.

¹²⁸ <https://docs.google.com/document/d/1MzjbHEWJOHB8G5cSItIS0mqCN8F9f01wDBVmdaR31yA>.

Social Solidarity and Caring



“What we need from you is to support one another. Go home tonight and check in on your neighbours. Start a phone tree with your street. Plan how you’ll keep in touch with one another. We will get through this together, but only if we stick together. Be strong and be kind.”

– Jacinda Ardern, Prime Minister of New Zealand¹²⁹

COVID-19 has affected people and businesses in ways that neither they nor governments could prepare for. For months, millions of people globally had to isolate at home, and many continue to do so. In the case of at-risk citizens, such as the elderly or those with pre-existing pulmonary conditions, leaving the house, even for groceries, could have serious consequences. Entire households also had to confine for weeks as a result of one person exhibiting a single potential symptom. In many situations, individuals and families had to depend on the benevolence of their communities to keep them going.¹³⁰

Accordingly, and especially during the early phases and peak of the crisis, communities at all levels began self-activating and organising to develop logistical solutions based on empathy, goodwill and a sense of shared responsibility. These solutions have demonstrated the flexibility, capacity and active participation of civil society organisations and individuals, channelling a spirit of solidarity that has generated thousands of mutual aid initiatives and completely novel structures. These diverse approaches have taken on different sizes and shapes in countries around the world creating a “superbloom of altruistic innovation” (Solnit, 2020). Governments have also gotten involved, seeking to nurture, scale and tap into this positive civic energy.

As with the Neighbor Express example discussed in the US Digital Response case study, many urgently developed solutions focused on helping those who could not leave home, for example, by delivering groceries or medical supplies. These types of mutual aid initiatives range from completely ad-hoc, spontaneous local social networks grown from a WhatsApp group chat or a Facebook Page, to national-level volunteer networks associated with a government agency. Examples of these solutions include the following:

- In Canada, a “caremongering” trend caught on early in the outbreak (Gerken, 2020). Local communities would set up dedicated Facebook pages for their area and post #ISO posts (“in search of” help requests), or #offer posts depending on whether they needed or were able to offer something. Another interesting initiative is the FlowAid project in London, which distributes sanitary products to women in need through the Home-Start Ealing mutual aid group.¹³¹
- Bespoke platforms have been built often through partnerships between multiple organisations including civil society organisations (CSOs). For example, the Czech Republic’s “Sousedská pomoc” platform, run by volunteers but affiliated with a number of organisations including CSOs and universities, is used by around 6 000 volunteers.
- Some governments have also tried to mobilise networks of volunteers. For example, the United Kingdom’s NHS Responders service (see Box 4) and France’s Civic Reserve sought to create central national databases to allocate volunteers to specific tasks.¹³² In Spain, the government partnered with the Spanish Red Cross to promote a similar campaign entitled #YaHagoPorTi (“I do for you”).¹³³ The Government of Italy launched a Digital Solidarity campaign inviting companies to volunteer digital products and services to those in lockdown at no cost.¹³⁴
- Government also mobilised resources to provide assistance. In Australia, for instance, the postal service partnered with pharmacies to create a contactless medicine delivery service.¹³⁵

¹²⁹ www.tvnz.co.nz/one-news/new-zealand/kind-jacinda-ardern-urges-people-support-one-another-coronavirus-alert-system-level-rises.

¹³⁰ The OPSI COVID-19 Innovative Response Tracker (<https://oe.cd/covidtracker>) includes hundreds of examples from around the world. This section highlighted key themes that OPSI has identified based on the tracker and on research. While this section or the report can only highlight a handful of examples, many additional innovative social solidarity responses can be found at <https://oe.cd/covid-social-solidarity>.

¹³¹ www.facebook.com/FlowAidProject.

¹³² <https://oe.cd/fr-civic-reserve>.

¹³³ <https://oe.cd/yohagoporti>.

¹³⁴ <https://oe.cd/it-solidarity>.

¹³⁵ <https://oe.cd/aus-post>.

Box 4: National Health Service (NHS) volunteer responders

The United Kingdom government has attempted to capture civic goodwill and enthusiasm through the creation of the “NHS Volunteer Responders” programme. The programme enables NHS health professionals to refer people out of the 1.5 million most at-risk individuals. Volunteers who sign up through the online portal and pass background and medical checks, are then matched with at-risk individuals to help with their needs in one of four roles:

1. Community response volunteers collect shopping, medication or other essential supplies for someone who is self-isolating, and deliver these supplies to their home.
2. Patient transport volunteers provide transport to patients who are medically fit for discharge, and ensure that they are settled safely back into their home.
3. NHS transport volunteers transport equipment, supplies and/or medication between NHS services and sites, and assist pharmacies with medication delivery.
4. Check-in and chat volunteers provide short-term telephone support to individuals who are at risk of loneliness as a consequence of self-isolation.

Since its creation, 750 000 volunteers have signed up to the programme, three times the number originally sought. Over 100 000 tasks have been registered on the site, allowing tens of thousands of at-risk people to receive help they would otherwise not have received. However, because many tasks are repeated for the same people, and so many volunteers signed up, many volunteers have not yet been contacted.

Source: <https://volunteering.royalvoluntaryservice.org.uk/nhs-volunteer-responders>, www.theguardian.com/world/2020/may/03/nhs-coronavirus-crisis-volunteers-frustrated-at-lack-of-tasks.

Volunteers have also shown their goodwill by helping specific sectors. In France, the Minister of Agriculture, Didier Guillaume, called “on men and women who are not working and locked indoors to join the great army of French agriculture” (Hansrod, 2020). This call boosted a campaign run by the French National Federation of Farmers’ Union, who had already launched their own online platform “Des Bras pour ton Assiette” (2020), which is supported by the Grand Est Region running through five countries (Belgium, France, Germany, Luxembourg and Switzerland). The platform connects French people interested in helping farmers, and farmers who were in desperate need of labour to replace seasonal migrant agricultural workers who could no longer enter the country. Over 40 000 people volunteered to support the French agricultural sector.



The key opportunity for governments is to work with these local, community-driven initiatives and foster their efforts in order to maximise their impact. French and British governments have both attempted to create centralised databases of mutual aid volunteers, although the solution to this challenge might result from local government intervention. For example, bodies such as the Grand Est region, who are better placed to understand and react to specific local contexts, may create better tailor-fit interventions for local communities. Thinking broadly, governments may also see value in how such social structures—comprising communities of people driven by goodwill and mutual concern—could provide a social infrastructure for a new wave of innovations, both generated by the networks as well as embedded within them.

Now that many countries seem to have passed the peak of the virus, governments are evaluating what to do next with these newly mobilised communities. For example, in France, the Civic Reserve declared its mission accomplished at the end of May and is now becoming a platform for public engagement.¹³⁶ It will be interesting to see what steps other governments take.

136 <https://covid19.reserve-civique.gouv.fr/engagement/actualite/mission-accomplie-et-si-on-continuit-ensemble>.

Reducing the Spread Through Virus Tracking and Adaptive Action



“You cannot fight a fire blindfolded. And we cannot stop this pandemic if we don’t know who is infected.”

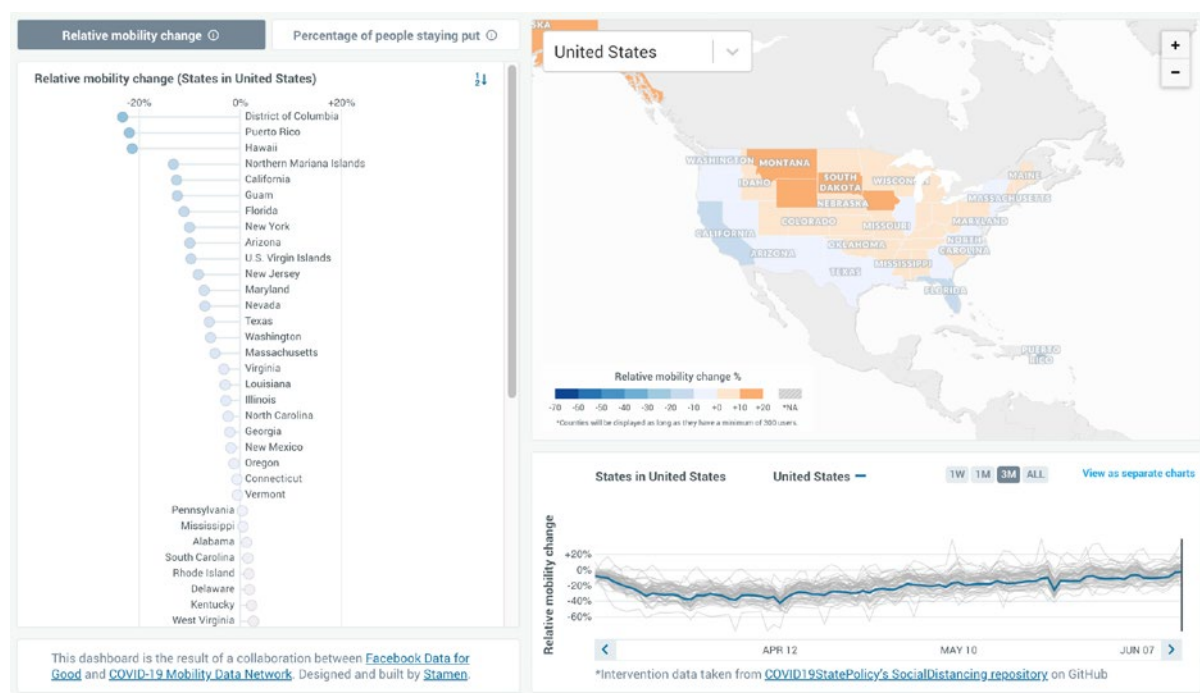
WHO Director General Dr Tedros Adhanom Ghebreyesus (WHO, 2020)

The need for governments around the world to make decisions based on good evidence and data has been amplified by the COVID-19 crisis, as incorrect, slow or misinformed decisions can cost lives.¹²⁹ It is vital that governments collect and interpret good and timely data about who has the virus, who had the virus, and who those people may have come into contact with and therefore might have the virus.¹³⁰ So far, this has proven an almost universal challenge, particularly in countries where the virus has taken hold on a larger scale. However, governments and their partners have been working to develop new and innovative solutions for tracking the virus and identifying people who may have it in order to generate better data and information and ultimately make better decisions for both individual and public health.

Macro-level actions: Tracking the virus and potential risk factors

Many of the innovative initiatives that have been created in response to the COVID-19 crisis involve macro-level aggregation of data and information, and sometimes even population-wide collection of anonymised data. Solutions have come directly from government as well as from outside sources, often in partnership or coordination with the public sector. For instance, the COVID-19 Mobility Data Network¹³¹ is an international network of infectious disease epidemiologists, who are working with technology companies around the world to provide data and solutions to government decision makers, “using anonymised, aggregated data sets from mobile devices, along with analytic support for interpretation”. On their website, they offer two different visualisation tools (see Figure 18) and technical resources including code repositories and mobility data metrics, as well as daily one-to-one debriefings for local health departments.

Figure 18: Movement trends from the Mobility Data Network dashboard



Source: <https://visualization.covid19mobility.org>.

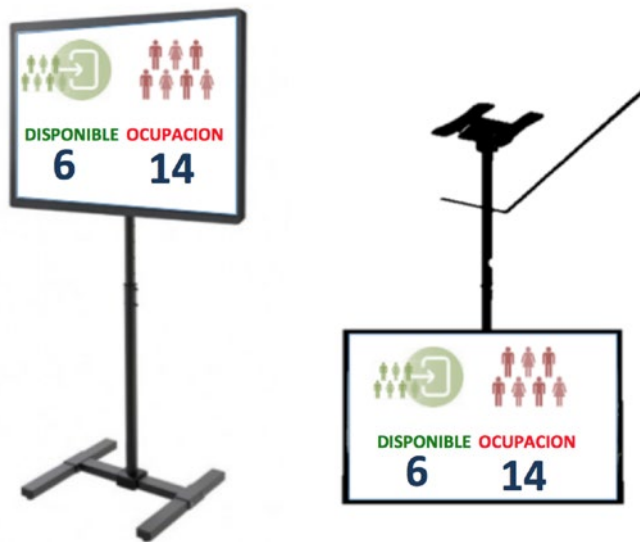
129 For country-by-country self-reported information on arrangements to ensure science-informed policy and decision-making for COVID-19, see <https://stiplab.github.io/Covid19/Q1A.html>.

130 The OPSI COVID-19 Innovative Response Tracker (<https://oe.cd/covidtracker>) includes hundreds of examples from around the world. This section highlighted key themes that OPSI has identified based on the tracker and on research. While this section of the report can only highlight a handful of examples, many additional innovative adaptive action responses can be found at <https://oe.cd/covid-adaptive-action>.

131 www.covid19mobility.org.

Some countries have opted to use meta-data harvested from different types of sources to enhance their public health decision-making. In Spain, in the Basque country, “Seeketing” nodes are being plugged into public places to detect mobile phones in the vicinity, with results visible through real-time alerts, on mobile devices and/or through public dashboards (see Figure 19).¹³² These nodes collect disaggregated data on mobile phones in the vicinity, providing real-time feedback to authorities and the public about when spaces may become overcrowded, which can help guide decisions for governments and individuals alike. Other countries have used completely disaggregated telecoms data to help establish general movement trends for the population (OECD, 2020d). Such data can show the extent to which people’s movements are increasing or decreasing, or highlight “erratic” behaviour, which is how the visualisation in Figure 18 is generated.

Figure 19: Example Seeketing dashboard showing capacity details for a room or business



Source: www.seeketing.com/demos/ACSCCOVID.pdf.

Population movements are not the only data being tracked at an aggregate, macro level. In one highly innovative initiative, the German government’s Robert Koch Institute has set up a Corona Data Donation programme and an app for mobile phones connected to fitness bracelets like Fitbits or other wearables such as Apple Watches, to help detect potential virus symptoms.¹³³ The app now has over 500 000 participants and is able to recognise various symptoms associated with a coronavirus infection. These include an increased resting heart rate (indicating fever) and a change in sleep and activity behaviour. All data are collected in aggregate form and anonymised. When pooled together, they can help scientists obtain a more precise picture of the spread of the virus. A number of other governments, businesses and research organisations are studying fitness trackers to understanding COVID-19 and other diseases (Fowler, 2020).

Micro-level action: Diagnostic assistance and contact tracing

While governments are harnessing vast amounts of anonymised data and observations to understand populations at scale, some of the most important and effective innovations centre around individuals. Understanding who may have the virus, and with whom they may have come into contact, is critical to preventing further spread. These innovations come in the form of diagnostic assistance and contact tracing. While some of these solutions have demonstrated cooperation with groups inside and outside of government, others have been controversial due to added layers of complexity around the sourcing and usage of data.

The most accurate way to know who has the virus is through testing. As governments continue to ramp up their testing efforts, some are finding innovative ways to identify people who may be more likely to have the virus, to be able to quickly refer them for testing. For example, the Government of Singapore has developed SPOTON, an AI-enabled thermal sensing solution that can be deployed quickly and affordably to help identify individuals in crowds who may have symptoms (i.e. a fever), in order to prioritise

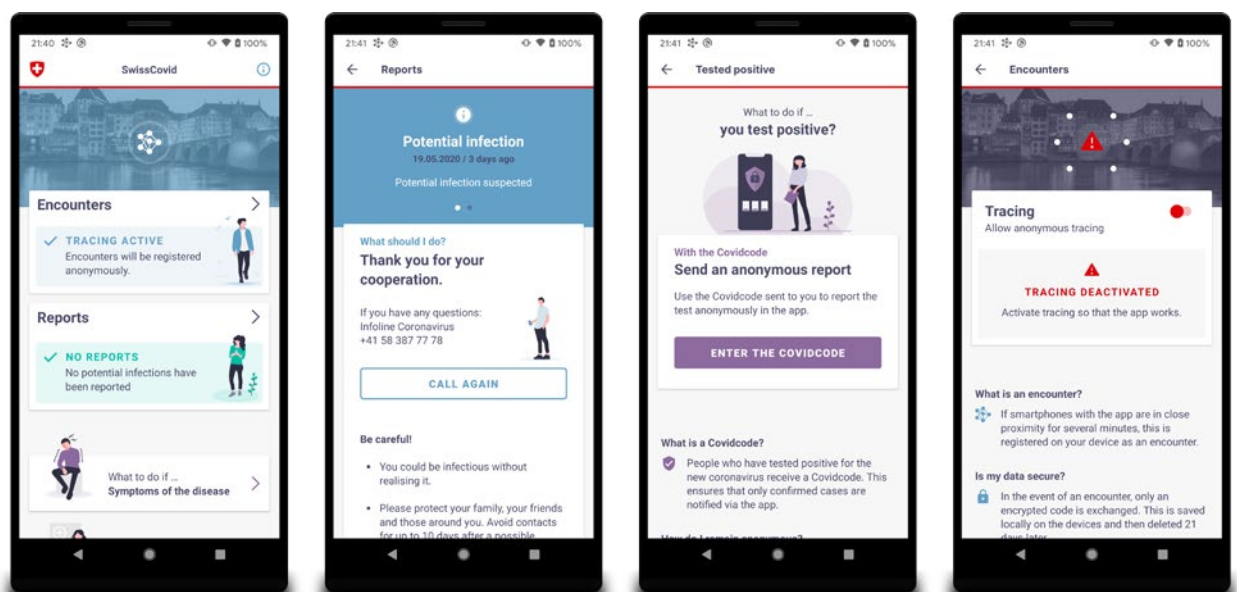
¹³² <https://oe.cd/es-covid-tracking>.

¹³³ <https://corona-datenspende.de>.

them for testing and, if needed, isolation (see the case study at the end of this section). Similarly, research indicates that wearables, as touched on earlier, may have the potential identify an individual's symptoms three days before they may notice symptoms such as a fever or shortness of breath (Fowler, 2020). If governments can identify who might have the disease, then they can apply other solutions to establish who else might be infected and mitigate the spread of the virus. Although they have great potential, these types of solutions are unable to identify asymptomatic individuals. Such cases will be difficult to track without wide-scale testing programmes.

An important tool for any government seeking to control the spread of the virus is contact tracing, a methodology designed to establish who infected people came into contact with when they were contagious. Contact tracing is not new; it was used to trace people during both SARS and Ebola pandemics. It can be extremely effective when combined with accurate testing, as it enables governments to more accurately isolate those who have the virus to prevent further transmission. However, modern times call for modern solutions. Governments have been rapidly implementing mobile contact tracing applications, which represents a significant innovation in this area. Many of these applications use Bluetooth technology to connect with other nearby phones running the applications, and alert the user if someone they were in close proximity to has been diagnosed with the virus. Some apps also incorporate geolocation data, which can provide more detailed analysis for governments but may also raise privacy concerns.¹³⁴

Figure 20: Switzerland's contact-tracing app



Source: <https://github.com/DP-3T/dp3t-app-android-ch>.

To date, this technology has experienced varying levels of success due to a number of factors, including:

- A critical mass of users. A critical mass of the population needs to use the app for it to be effective – around 60% according to modelling at Oxford University (Big Data Institute, 2020). So far, it has proven difficult to encourage citizens to opt-in at that scale. Singapore developed an innovative solution to this issue, developing Bluetooth lanyards with their own battery to encourage users to opt-in who may have otherwise resisted due to complaints about Bluetooth connections draining their battery (Yu, 2020).
- Data privacy and ethics concerns.¹³⁵ Critics have raised concerns over where and how the data are anonymised and stored – whether locally on a user's device or in a more centralised manner by a government or private company. For example, China's "close contact app",¹³⁶ which stores data centrally, has sparked concerns of surveillance (Zhong, 2020). Apps that use geolocation data have also received criticisms regarding privacy (Lomas, 2020a).
- Questions of effectiveness. Many questions have been raised about the effectiveness of these apps and whether they can fulfil government hopes (Soltani, Calo and Bergstrom, 2020). Some studies also show that Bluetooth signals can vary significantly depending on, for example, where a user keeps their phone (Leith and Farrell, 2020). Early research (McLachlan et al., 2020) shows that they can be beneficial when combined with other measures, but more evidence is needed to support their effectiveness.

¹³⁴ See www.nature.com/articles/s41591-020-0928-y for an overview of government and private apps for COVID-19 response, including contact tracing, and the privacy approaches taken by each.

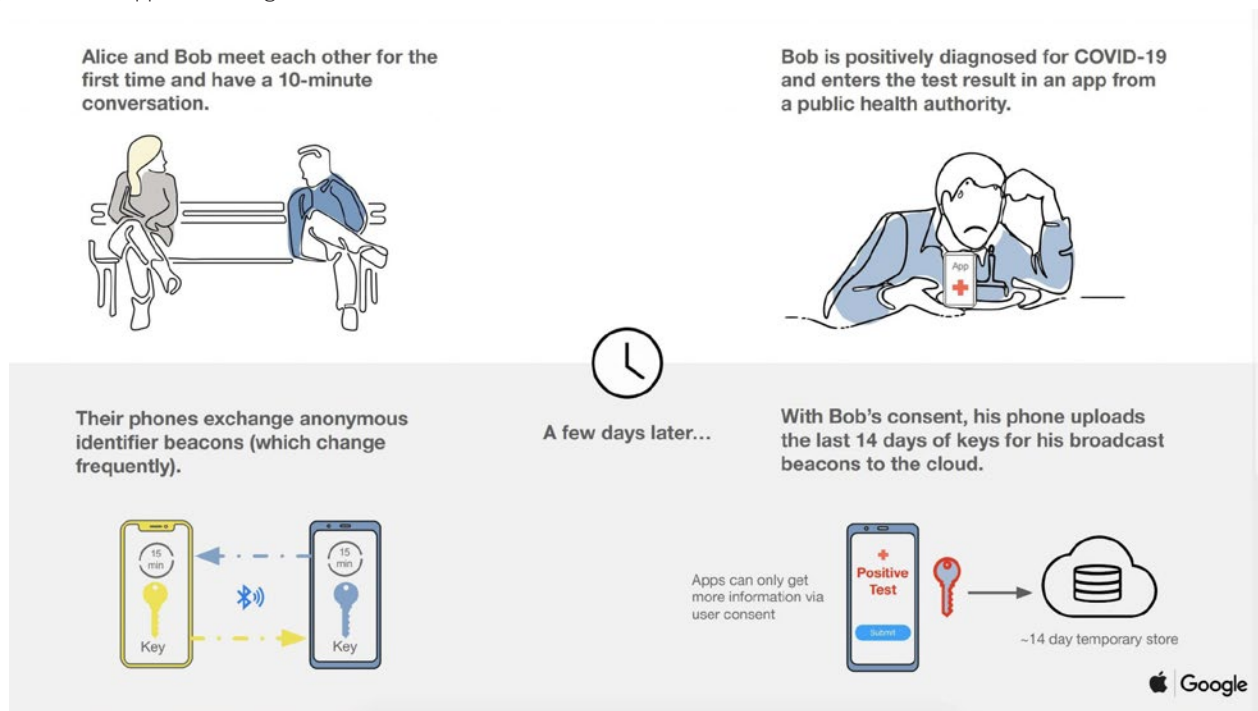
¹³⁵ For a more in-depth discussion and recommendations on this topic, see Ensuring data privacy as we battle COVID-19 at <https://oe.cd/covid-data-privacy-as-we-battle-covid-19-36c2f31e>.

¹³⁶ <https://oe.cd/cn-close-contact>.

Governments are moving forward with apps at a rapid pace. These can generally be divided into two types based on how they store data:

- **Centralised approach.** Some apps record only a local history on phones with whom the user has connected via Bluetooth, while others also store information on an anonymised but centralised encrypted database of records. This database allows public health bodies to track different geographic and demographic trends to inform decision-making. One example of this is Norway's "Smittestopp",¹³⁷ an app that relied on Bluetooth readings as well as geolocation data. Iceland's app also makes use of geolocation data,¹³⁸ while France's StopCovid uses a centralised architecture but relies only on Bluetooth (Dillet, 2020). India's controversial Aarogya Setu (Bridge to Health) app,¹³⁹ which is mandatory for public and private sector employees, relies on both Bluetooth and geolocation data, and connects to a central database. It includes a self-assessment questionnaire that asks about potential symptoms, with responses sent to a central government server. Centralised approaches, as well as ones that collect geolocation data, have shown themselves to be more controversial and prone to privacy-related criticisms. Very recently, Norway suspended its Smittestopp app after the country's data protection agency determined that the app "can no longer be regarded as a proportionate encroachment on users' basic privacy rights" (Lomas, 2020a). The UK has also abandoned plans for a centralised app (Lomas, 2020b).
- **De-centralised approach.** Other countries have implemented decentralised solutions, with data stored only on users' devices, which many argue provides for greater privacy protection. This approach has benefited from a partnership between Apple and Google to develop a contact-tracing app framework. Some national governments invested in this approach from the outset, such as Switzerland, which was the first country to launch its own app using Google and Apple's application programming interface (API) (see Figure 21). Denmark is now following the same approach and launched an app in June that has registered 619 000 downloads, corresponding to approximately 11% of the Danish population.¹⁴⁰ Germany has also recently launched a decentralised app that uses the Apple and Google protocols.¹⁴¹

Figure 21: How Apple and Google's solution works



Source: Apple and Google.

While debates over privacy, effectiveness and approaches rage on, governments are nonetheless rolling out contact tracing apps at high speed. Such applications are increasingly being developed as open source software, providing transparency and allowing others to scrutinise the code and how it protects privacy. Open source releases also allow other developers to duplicate and re-use code, as is the case in Switzerland which has open sourced its code base.¹⁴² As seen above in the examples of Apple and Google, contact-tracing apps are also increasingly the product of cross-sector partnerships (OECD, 2020d). For example, the creators of Singapore's Trac-eTogether app have announced that they will work with Apple to make their app more effective for iOS users (Criddle and Kelion,

137 <https://helsenorge.no/coronavirus/smittestopp>.

138 <https://oe.cd/is-tracing>.

139 <https://oe.cd/aarogya-setu>.

140 <https://oe.cd/dk-tracing>.

141 <https://www.bundesregierung.de/breg-de/themen/corona-warn-app/corona-warn-app-englisch>.

142 <https://github.com/DP-3T>.

2020; TraceTogether, 2020), and have opened up its underlying privacy-preserving protocol for data exchange (OECD, 2020d).¹⁴³ Poland has also announced that the country will modify its version of the app to embrace a “distributed model...prepared by the consortium of Google and Apple”.¹⁴⁴ The interplay between governments and Apple and Google have led to interesting debates, with some arguing that the companies are dictating public policy by limiting the solutions that they allow to operate on their devices.¹⁴⁵ Aside from companies, governments are also building on work coming from outside the private sector. Both Norway and the United Kingdom have partnered with a team at Oxford, who published a study on a contact-tracing app solution, to help design their own apps.¹⁴⁶

Moving away from apps, some countries have found other innovative methods for targeted virus tracking and contact-tracing. In Brazil, an AI-assisted interactive voice response (IVR) robot is carrying out over-the-phone interviews with Brazilians about their movements, their use of public transport and their contact with potentially infected people in recent days, then cross-referencing the information with a database and using Big Data analysis to assess who else might be at risk.¹⁴⁷ The IVR will then ask for permission to make follow-up calls every 8, 10 or 12 hours, as necessary.

Some government actions have been innovative, but perhaps also more invasive. For example, South Korea does not have a contact-tracing app, but does have a Self-quarantine Safety App, which assigns those isolating with COVID-19 a member of staff to monitor their symptoms remotely twice a day, and then verifies whether the user breaks the quarantine by checking their GPS location.¹⁴⁸ However, this approach is only done with user consent. China employs an app that presents a QR code which can be scanned to confirm the health status of the user. In Hangzhou, China, there are now plans to incorporate other health data into this app to create a health index (Davidson, 2020). Another example comes from India, where the local Karnataka Government requires people isolating to send regular geo-tagged selfies.¹⁴⁹ A minister stated that a failure to share an hourly update between 7 am and 10 pm could mean isolators are moved to a government mass quarantine facility (The Economic Times, 2020).

Governments are exploring possibilities for collecting data at new scales and in new ways to combat the unprecedented health threat. However, in their understandable rush to move quickly, some governments are making decisions about privacy and data that in ordinary times might have taken years of public debate to build a consensus around. While some polls have shown public support for contact-tracing apps,

such as in Switzerland (Swissinfo, 2020), others have not. An Australian study (Dennis et al., 2020), found that citizens preferred the use of macro telecoms data, despite the lack of an opt-out capability, rather than an opt-in contact-tracing app. Accordingly, the questions for data and tracking innovations are two-fold: firstly, what impact will they have on the ability for governments to suppress the virus, thereby easing the re-opening of society? And, secondly, how will governments leverage data-driven decision-making and technologies in other areas?

The OECD has developed some best practices to help guide governments in their actions (see Box 5).

Box 5: OECD best practices for contact tracing

Contact-tracing apps should be implemented with full transparency, in consultation with major stakeholders, robust privacy-by-design protections and through open source projects (where appropriate). Governments should consider:

- The legal basis for the use of these technologies, which varies according to the type of data collected.
- Whether the use of these technologies and the subsequent data gathering is proportionate, and how the data are stored, processed and shared, and with whom.
- The quality of the data collected and whether it is fit for purpose.
- Whether the public is well-informed and the approaches adopted are implemented with full transparency and accountability.
- The time period within which more invasive technologies that collect personal data may be used to combat the crisis. Data should be retained only for so long as is necessary to serve the specific purpose for which they were collected.

Source: <https://oe.cd/covid-tracing-privacy>.

¹⁴³ <https://github.com/opentrace-community>.

¹⁴⁴ <https://github.com/ProteGO-Safe/specs/blob/master/README-ENG.md>.

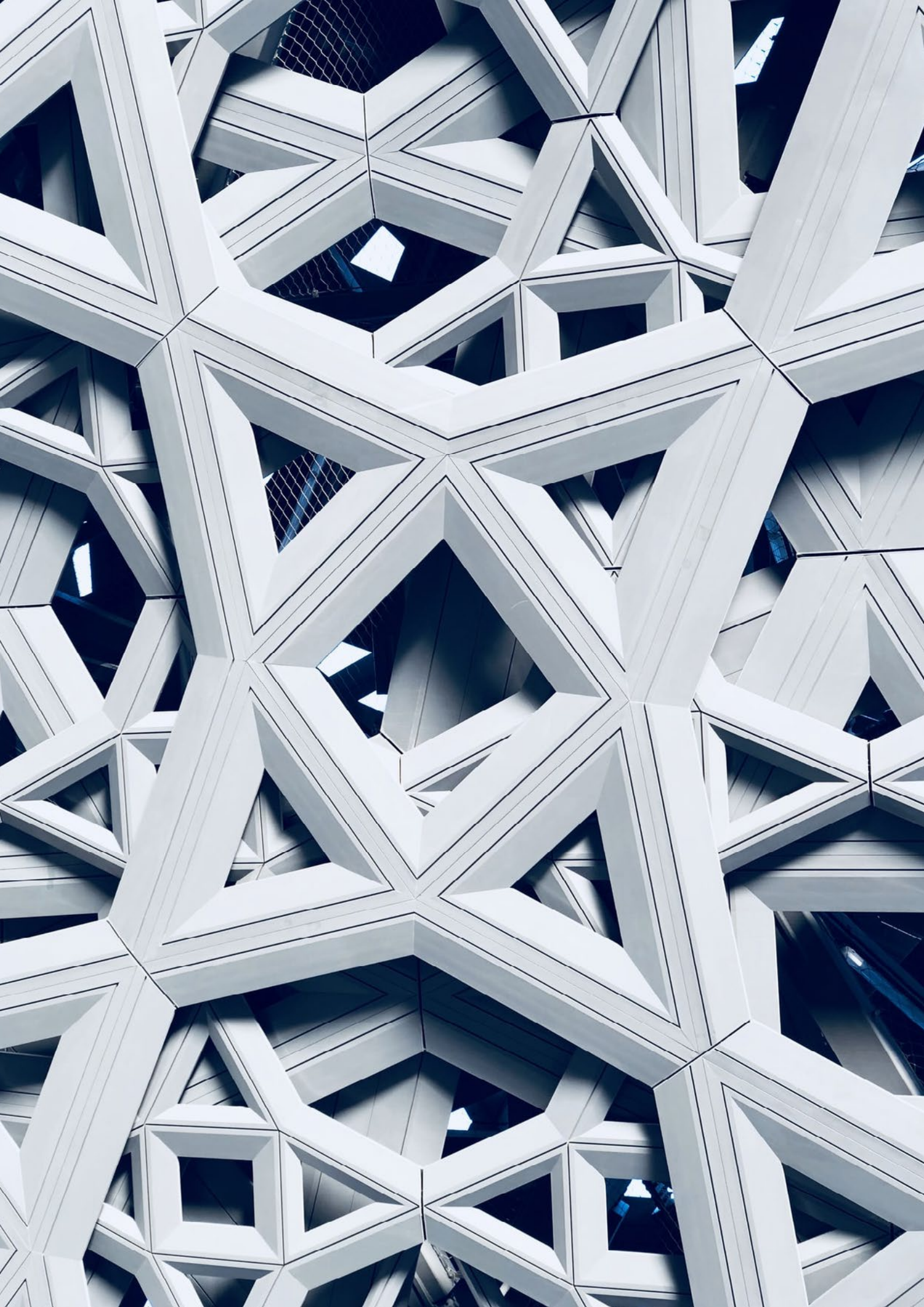
¹⁴⁵ For more details on this, see www.bloomberg.com/news/articles/2020-05-18/apple-and-google-face-off-against-europe-over-contact-tracing and www.washingtonpost.com/technology/2020/05/29/apple-google-contact-tracing/.

¹⁴⁶ www.ox.ac.uk/news/2020-04-02-controlling-coronavirus-using-mobile-app-trace-close-proximity-contacts.

¹⁴⁷ <https://oe.cd/br-ai-tracking>.

¹⁴⁸ <https://oe.cd/qr-quarantine-app>.

¹⁴⁹ <https://oe.cd/india-selfies>.



An aerial photograph of a park with several large, circular paved areas. Each circle has a central circular feature, possibly a fountain or a small garden. The paths are paved with light-colored stones or bricks. There are many green trees and bushes scattered throughout the park. The overall scene is a lush, green urban space.

SPOTON

AI-powered thermal scanning, Singapore

Governments around the world are investing in real-time monitoring solutions to find ways to balance their need to end lockdowns with the public health risks of allowing social contact. With this objective in mind, Singapore's Government Technology Agency (GovTech) developed an infrared thermal crowd sensor using store-bought commercially available components augmented with an in-house created facial detection AI system. The ease of assembly and the accuracy of the innovative AI technology has generated tremendous interest from governments, who want to use this technology to identify potential COVID-19 cases and allow citizens to return to public spaces.

The problem

Following the initial wave of lockdowns, governments are eager to fully re-open their societies and economies, but they are wary of the risks of people assembling, as public spaces can serve as hotbeds for transmission. There is no way of being certain whether someone in a group has a coronavirus. However, given that a fever is one of the most common symptoms of COVID-19, measuring the temperature of individuals can provide a proxy indication for infections among those symptomatic (Harwell, 2020). This can be done through “thermal sensing” scanner technology, which has traditionally been used for defence and security purposes, but has also been deployed in previous outbreaks such as SARS (Chiu et al, 2005). This solution was implemented early on in the COVID-19 outbreak in China. However, rolling out the technology comes with a number of challenges associated with development, installation, privacy, accuracy and other technical issues. Cost is another factor as commercial grade solutions can cost USD 10 000-20 000 per installation.

An innovative solution

GovTech has created SPOTON, a crowd thermal-sensing solution enhanced with AI and built with low cost, off-the-shelf hardware components, to facilitate quick, effective, crowd temperature screening in busy public spaces and government buildings. It is inspired by various technological advances in recent years in AI in both facial detection and thermal-sensing software, leading to accuracies of within 0.2 °C,¹⁵⁰ and driven by the need for a low-cost solution. The GovTech team managed to develop this solution within a week from the moment when Chinn Lim, a Senior Director in GovTech, first contacted Jiayi Chong, the lead engineer on the project. Working as part of a two-person team, Chong used his background in robotics, R&D and machine learning, acquired while working at Pixar, to help develop this low-cost solution, which was then improved over time (e.g. the software now targets an individual’s forehead to account for people wearing a mask).

Figure 22: SPOTON can take the temperatures of groups of up to 10 people in real time



Source: GovTech.

150 See the discussion in www.sciencedirect.com/science/article/pii/S0378778818309629 and http://openaccess.thecvf.com/content_ICCVW_2019/papers/CVPM/Lin_A_Thermal_Camera_Based_Continuous_Body_Temperature_Measurement_System_ICCVW_2019_paper.pdf.

SPOTON allows government offices to conduct quick and effective crowd temperature screening with low-cost commodity hardware components. The hardware consists of a thermal-sensing camera module and processor chip that, combined, cost about EUR 750 (equivalent), and can be assembled in less than 5 minutes. The hardware components are then augmented by GovTech-designed AI software, which incorporates internally developed facial detection features. In response to concerns about privacy, GovTech have stressed that their software employs facial detection rather than facial recognition, implying that it cannot be used to identify or track individuals in a centralised systematic manner. In other words, the software can detect the presence of a face and its location, but cannot capture or recognise the details of a face or cross-reference it with a database of faces to determine the identity of the person.

Figure 23: A typical set-up for the SPOTON Thermal Sensor



Source: GovTech.

Advances in technology mean that AI-enhanced thermal-sensing components can offer better accuracy than many popular long-wave infrared (LWIR) bespoke technologies, at a fraction of the cost. In trials undertaken with the National Metrology Centre, GovTech reported that the maximum deviation from the source temperature over a 12-hour period was an impressive 0.3-0.5 °Celsius. The use of auto-calibration methods and enhanced facial detection allows the results of the scanning to be visualised in real time, enabling people with fevers to be detected with far greater accuracy than ever before.

The apparatus is usually mounted on a tripod and positioned at an entrance to capture people walking past the camera. The AI component can scan up to 10 faces at once. When the software detects a face over the threshold temperature, it will trigger a sound, alerting a security guard. Security per-

sonnel can then double check the person's temperature and, if needed, prevent them from accessing the building. This process is much quicker than taking temperatures person by person with a handheld scanner, and minimises the exposure of staff. The software has also been designed to run on typical, low performance laptops provided by government agencies, enabling any government employee to operate the thermal sensor. If an individual is found to have a fever, they are referred for additional medical screening.

GovTech's first funding round was used to create 50 sets of scanners, which have been implemented in government buildings across the country.

Novelty

SPOTON is notable for its replicability, design and custom-built AI solution, which elevates it above commercial alternatives. Moreover, the cheap cost of the components, at less than EUR 750, the fact that similar equivalent components can be substituted should they meet a basic accuracy criteria, and the ease of assembly, distinguish this product from other off-the-shelf solutions.

Figure 24: Off-the-shelf, inexpensive camera and chip



Source: GovTech.

Furthermore, the use of accurate facial detection software to facilitate temperature measurement is beyond the technical capabilities of many commercial solutions. Other thermal-sensing solutions measure the highest temperature in the scene, which does not guarantee accuracy and can be confused by the presence of hot items in the scene (e.g. a cup of coffee). This solution, which uses GovTech's in-house facial detection software, specifically targets faces, thereby increasing the accuracy of the technology.

Results and impact

Due to the price and efficacy of SPOTON, over 10 000 units have now been requested through GovTech, with replication inquiries made by a number of other governments.



Challenges and lessons learned

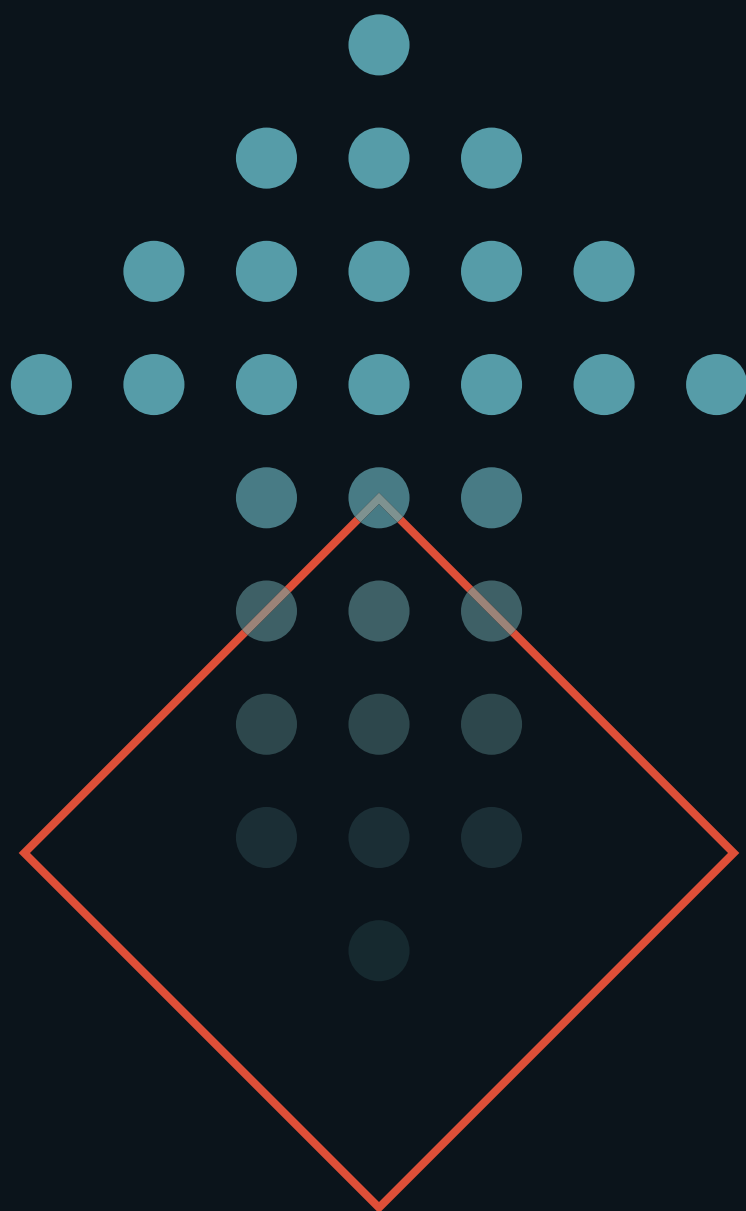
While the technology can be used to identify an individual with a high temperature, many people carrying the virus do not exhibit fever as a symptom, or at least not right away. As of writing, there is no established scientific consensus regarding the proportion of infections that are asymptomatic; however, the French Pasteur Institute has estimated that the virus is “asymptomatic or paucisymptomatic (causing little or no clinical manifestations) in 30% to 60% of infected subjects” (Institut Pasteur, 2020). As a result, this system may not detect people who are infected but do not present with a fever. The creators of SPOTON explained, however, that the solution was only intended to complement the existing ecosystem of testing and tracing, and to prevent people exhibiting the most common symptoms from spreading the virus in public spaces.

Given that thermal-sensing solutions are becoming increasingly popular, GovTech emphasises the unobtrusive nature of the scanning process, which provides for detection without violating the privacy of citizens. GovTech understands that citizens need to be confident that the scanning technology is not being used for reasons other than the specific purpose of measuring the temperature of faces in real time.

Replicability

SPOTON's creators believe that other governments should be able to duplicate the technology. The hardware components are commercially available and inexpensive. In addition, GovTech is offering the AI-enabled software solution at no cost. The solution is not yet available in an open source format, as the developers want to ensure quality control of the software, which is key to its accuracy. However, interested governments can submit requests for the software and assistance with replication by emailing sensors@tech.gov.sg.

Forging a Path to Recovery



“I believe that the world will have to learn to live with corona in our midst.”

David Nabarro, WHO Special Envoy on COVID-19¹⁵¹

The enduring nature of the crisis has encouraged governments to start thinking about solutions that will permit the resumption of certain social and economic activities before the virus has been eradicated. Many of these solutions will demand a re-imagining of the previous status quo. Fortunately, crises have historically been strong drivers of innovation. They can provide greater clarity about the underlying needs and objectives, and demand new ways of thinking and working as the existing ways become untenable. In particular, there is an opportunity not just to imagine how things might be different, but also to start building on these new ideas. This ability to move quickly and envision and execute new ways of doing things is reflected in the many examples of innovation presented in this report, all of which highlight new types of action, and new partnerships and collaborations both within and outside government.¹⁵²

Some have just begun to leave full crisis mode and move towards recovery, but OPSI and MBRCGI have found that governments are already taking innovative steps that align closely with the saying “think globally, act locally”, or perhaps more accurately, “think systemically, act locally”. These efforts reflect policy domains that are increasingly indistinct, with policy makers recognising that any innovation exists within complex systems. For example, the ways in which people move around a city combines infrastructure, logistical, health, economic and environmental issues. Innovative governments are realising that they need to take systems approaches (see Box 6) in order to effect actual change as they move into recovery mode. These approaches are often led by governments in coordination with stakeholders within and across different levels of government, as well as across sectors. At the same time, governments are taking action at the local level, closer to the people and where innovation can have the greatest impact on their lives.

Box 6: Systems approaches

Systems approaches analyse the different systemic elements underlying a policy problem, as well as the dynamics and interactions of these elements that produce a particular outcome. This holistic analysis focuses on the impacts and outcomes of policies through the involvement of all affected actors inside and outside government, as well as the importance of leaving room for iterative processes to account for uncertainty.

Such approaches differ from traditional approaches in which policy makers address social problems through discrete interventions layered on top of one another. Such approaches may shift consequences from one part of the system to another, or address symptoms while ignoring causes. Evaluating the whole system rather than just the parts allows systems approaches users to determine where change can have the greatest impact.

Source: OECD (2017), *Systems Approaches to Public Sector Challenges: Working with Change*, <http://dx.doi.org/10.1787/9789264279865-en>.

Thinking systemically

In order to emerge from this crisis we will need new types of forward thinking and systemic innovations which recognise that problems are not simple, and that state interventions do not generate linear cause and effects. Governments are starting to think about how interventions for specific COVID-related problems will affect other priorities. In the short term, some governments have started to align creative interventions to help improve sectors in need. For example, Innovation Norway has allocated NOK 178 million (approximately EUR 16.3 million) to support domestically focused tourism efforts.¹⁵³ This endeavour seeks to address three elements of the crisis: the understandable human desire to escape isolation; the fact that international travel may be severely limited for some time; and, linked to that, the challenges facing the tourism industry.

151 www.bbc.com/news/av/health-52369969/who-s-nabarro-we-must-learn-to-live-with-covid-19.

152 The OPSI COVID-19 Innovative Response Tracker (<https://oe.cd/covidtracker>) includes hundreds of examples from around the world. This section highlighted key themes that OPSI has identified based on the tracker and on research. While this section of the report can only highlight a handful of examples, many additional innovative recovery-oriented responses can be found at <https://oe.cd/covid-recovery-responses>.

153 <https://oe.cd/no-tourism>.

In a likeminded spirit of forward and systemic broad-thinking, some bailouts of airlines,¹⁵⁴ particularly those initiated by EU states, have come attached with innovative conditions. For example, the bailout of Air-France-KLM in France, worth EUR 7 billion, has a particularly striking “rail alternative” condition. It states that Air France must eliminate flights that conflict with train alternatives, particularly for journeys under two hours. Speaking on this issue, Minister Bruno Le Maire stated that the crisis provided an opportunity to “reinvent our model of economic development to ensure it is more respectful of the environment” (Raily News, 2020). This solution was offered not only with the current situation in mind, but also with a view to planning how the crisis can and will precipitate the future of government, taking into consideration which pre-COVID aspects of life should not be returned to “normal”.

This type of large-scale systems is not restricted to national or federal level organisations; local governments constitute key nodes in global systems in an interconnected and increasingly urbanised world (Sassen, 2001), and represent the key bridge in thinking systemically while acting locally. The COVID-19 crisis has shown that city administrations are not only thinking about adapting their local systems, but also anticipating their role in global, trans-national systems. For example, C40 Cities is a network of municipalities from around the world who are working to take “bold climate action”.¹⁵⁵ In the midst of the ongoing COVID-19 crisis, they launched a C40 Knowledge Hub¹⁵⁶ which is regularly updated with resources for cities to better understand and respond to the pandemic. They also created the “Global Mayors COVID-19 Recovery Task Force”, which established nine forward-looking principles to help “ensure that cities can emerge from the crisis safer, healthier and more sustainable than before” (see Box 7).

Box 7: Global Mayors COVID-19 Recovery Task Force –principles for recovery:

- The recovery should not be a return to “business as usual”
- The recovery, above all, must be guided by an adherence to public health and scientific expertise
- Excellent public services, public investment and increased community resilience will form the most effective basis for the recovery
- The recovery must address issues of equity that have been laid bare by the impact of the crisis
- The recovery must improve the resilience of our cities and communities
- Climate action can help accelerate economic recovery and enhance social equity
- We commit to doing everything in our power and the power of our city governments to ensure that the recovery from COVID-19 is healthy, equitable and sustainable
- We commit to using our collective voices and individual actions to ensure that national governments support both cities and the investments needed in cities
- We commit to using our collective voices and individual actions to ensure that international and regional institutions invest directly in cities.

Source: www.c40.org/other/covid-task-force.

Figure 25: C40 global gathering of city leaders



Source: www.c40.org/blog_posts/cities-unite-to-tackle-covid-19-as-president-trump-attacks-the-world-health-organisation.

154 The Business Traveller website is tracking bailouts from across the world www.businesstraveller.com/features/these-airlines-have-received-a-bailout.

155 See <https://c40.org> for source and additional details.

156 www.c40knowledgehub.org.

Acting locally

Governments are not only examining their role within global systems and across subject areas; in many cases, they are also driving recovery efforts by influencing societal behaviours towards different modes of consumption of public goods and services at the local level. It is vital that cities quickly re-shape public spaces for the health of their citizens, but they must also think about how such changes can have impacts across multiple sectors.¹⁵⁷ For instance, Milan was one of the first mega-cities to reallocate street space from cars to walking and bikes, giving 35 km of roads to pedestrians and cyclists to keep air pollution down (Laker, 2020) and provide more space to allow people to distance themselves from others. That same logic is at work in Paris, which is closing 50 km of roads to facilitate more space for cycling and walking.¹⁵⁸ While the measure is temporary, Mayor Anne Hidalgo is open to making certain changes permanent due to civic pressure for fewer cars and reduced pollution (Henry, 2020). Lastly, in Vilnius, a particularly creative solution has seen large public spaces opened to allow restaurant clients to buy food, but eat outdoors in a safe & socially distanced manner (Henley, 2020).

Figure 26: Transformation of streets in Milan



Source: www.theguardian.com/world/2020/apr/21/milan-seeks-to-prevent-post-crisis-return-of-traffic-pollution.

Effective local solutions can emerge from anywhere, and governments need to be ready to support them. Some local areas have developed platforms that allow local residents to purchase the future services of current businesses in need. For example, a non-profit in Slovenia created a website where customers can purchase vouchers for over 270 services and products.¹⁵⁹ In Wellington, New Zealand, businesses can sell gift cards or vouchers for free through a website created by the Bolton Hotel.¹⁶⁰ Governments have endorsed and scaled these types of initiatives. For instance, the government agency Business Finland is supporting a platform developed through their Hack the Crisis hackathon which allows Finnish people to buy gift cards for future use at restaurants closed during the crisis.¹⁶¹

Thinking in new ways in terms of systems, scales and partnerships is difficult, and requires change at both the individual and organisational level. But it is possible, and perhaps a crisis is the best time to do it. In order to adapt and anticipate the necessary innovations for difficult and complex future problems, policy makers may well be served by the advice of Giuseppe Sala, the Mayor of Milan, who said “we must be ambitious and focused, as well as creative”.¹⁶²

This section is entitled Forging a Path to Recovery; however, this path is only just beginning to be laid out and will require major efforts over the coming months and years. Fortunately, governments have the potential to shape the way ahead, in large part through innovation.

157 For a full discussion, see the International Transport Forum (2020) “Reshaping Our Cities for Resilience”, <https://www.itf-oecd.org/sites/default/files/respacing-cities-resilience-covid-19.pdf>.

158 <https://oe.cd/paris-public-spaces>.

159 <https://oe.cd/si-vouchers>.

160 <https://oe.cd/nz-vouchers>.

161 <https://app.hackjunction.com/projects/hack-the-crisis-finland/view/5e766bb251977300491a2685>.

162 www.c40.org/press_releases/11-mayors-unite-global-mayors-covid-19-task-force.






Conclusion

The COVID-19 crisis is far from over. It continues to ripple throughout the world, causing major societal and economic upheaval. No one yet knows whether the virus will recede and remain under control, or whether a second wave of rapid contagion will erupt later in 2020 or 2021, with sobering outcomes regardless of the end scenario (OECD, 2020a). With no vaccine or treatment widely available, policy makers will continue to walk a tightrope; however, governments and their partners have demonstrated the capacity to manage this delicate balancing act and devise ambitious, focused and innovative ideas and solutions, under exceptional circumstances.

The innovative actions taken by governments over the last few months highlight the critical role of the public sector, and have proven its capacity to innovate at breakneck speeds. Governments have also demonstrated an ability to explore every option and tap potential resources to overcome difficult challenges. Indeed, by some measures, governments have never had more tools at their disposal to deal with this crisis, including more structures for collaboration, more technologies to build upon and more ways of analysing different types of data; and they have worked to seize practically every opportunity.

Going forward, the question is how governments can continue to innovate in individual ways, better and faster, while simultaneously considering how these innovations fit together as part of a broader picture. While this report is full of examples of innovative action, including initial steps in thinking systemically, OPSI and the MBRCGI believe that additional emphasis must be placed on developing, implementing and communicating systems strategies for innovation in the medium and long term. OPSI's work has found that a consistent, strategic message from senior levels of government can serve as a unifying and guiding mechanism to help all players advance together towards common goals. However, given the urgent short-term demands in times of crisis, it can be difficult or near impossible to foster a long-term strategic view that can prioritise better outcomes for tomorrow, while taking action to address urgent needs today. As we move towards recovery, efforts to develop a more systems-wide, strategic view of innovation are critical.

Such systems strategies must be both reflective and prospective. In being reflective, governments must consider and seek to uncover ways in which the COVID-19 crisis, as well as actions taken in response, can reinforce pre-existing challenges and inequities. For instance, many of the innovations in this report represent an accelerating shift to digital, yet the digital divide still prevails in much of the world (OECD, 2019). Furthermore, in rapidly executing solutions, many long-standing difficult debates on privacy and ethics have been fast-tracked or set aside, at least for the time being. While the public sector has undergone years of advancement in just a few months, governments must not forget to reflect on and seek to address persistent systemic and structural issues.



In being prospective, governments must consider what challenges remain on the horizon and what might be done to prepare for these future scenarios. An array of futures and foresight tools exist that can help such as those available on OPSI's Toolkit Navigator,¹⁶³ while taking action based on these scenarios serves as the central focus of OPSI's Anticipatory Innovation Governance programme.¹⁶⁴ OPSI has found that anticipatory innovation is the least developed of all facets of public sector innovation.¹⁶⁵ It is time for governments to address this omission and prepare for future shocks, such as those related to climate change.

While the crisis has been extremely difficult, it also represents a potential catalyst for change.¹⁶⁶ By moving towards a systems approach, focused on the desired state of the future as well as the lessons and unresolved issues of the past, governments are in a unique position to shape the world in ways unfathomable six months ago. OPSI and the MBRCGI will be working with governments and telling their stories as they move forward.

163 <https://oe.cd/futures-tools>.

164 <https://oe.cd/anticipatory>.

165 <https://oe.cd/innovationfacets>.

166 <https://oe.cd/covid-catalyst>.

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