



INNOVATIVE RESPONSES TO COVID-19

Future pathways for 'techvelopment' and innovation

TABLE OF CONTENTS

Introduction	5
Covid-19: impact and innovative responses	9
Women's health and rights	9
Refugees, migrants and IDPs: education, livelihoods and employment	16
Sustainable food security and Covid-19	22
Covid-19 and future pathways for technology and innovation in humanitarian and development work	29
Conclusion	37
Notes	41

This report is written by Adam Moe Fejerskov and Dane Fetterer, DIIS.
The report has been commissioned by the Ministry of Foreign Affairs.

DIIS · Danish Institute for International Studies
Østbanegade 117, DK-2100 Copenhagen, Denmark
Tel: +45 32 69 87 87
E-mail: diis@diis.dk
www.diis.dk

Layout: Lone Ravnkilde

ISBN 97887-7236-022-5 (pdf)

DIIS publications can be downloaded free of charge or ordered from www.diis.dk
© Copenhagen 2020, the authors and DIIS



INTRODUCTION

On the final day of 2019, public health officials in Wuhan, China informed the WHO China Office that 41 patients had been admitted to hospital with ‘pneumonia of unknown cause.’¹ Though fever and coughing were not particularly abnormal symptoms in winter, the proximity and timing of these cases were noteworthy. Churning up memories of the 2003 SARS outbreak in Guangdong, China – an illness caused by animal-to-human transmission of the Severe Acute Respiratory Syndrome coronavirus – the WHO launched an investigation into the matter. More than a week later, on January 7, Chinese researchers successfully identified and isolated the SARS-CoV-2 strain of coronavirus.

Now, more than half a year later, the documented global effects of Covid-19 are profound. As of late October, there had been roughly 44 million cases worldwide, resulting in more than a million deaths. At the individual level, Covid-19 causes respiratory symptoms and others akin to influenza or pneumonia. Globally, however, disaggregated datasets are demonstrating uneven distributions of the health and social impacts across demographic and socio-economic groups.² While the direct health impacts of Covid-19 are significant, the indirect impacts caused by preventive measures such as stay-in-place enforcements, the closing of borders and disruptions to supply chains, are also having an immense toll on vulnerable populations, showcasing the pronounced unequal effects of the pandemic. Communities with inadequate supply-chain and transportation infrastructure have been hit systematically hard, while most of those with robust and inclusive systems have managed to dampen the impact of the pandemic. As borders close and citizens are forced to stay indoors, access to food and other basic goods is being blocked off.

Inequality is perhaps the most striking feature of this pandemic. Certain groups disproportionately affected by it, such as women, refugees and migrants, will occupy a large focus in this paper. In most of the world, women occupy the great majority of frontline health-worker positions, putting them at increased risk of infection. Beyond the direct impact of the virus, massive increases in sexual and gender-based violence (SGBV) towards women and LGBTQ+ communities, alongside decreases in access to services related to sexual and reproductive health and rights (SRHR), are putting many at increased risk. These implications are not only short-term but risk undoing the fragile progress made in recent years on SRHR and gender equality more broadly. At the same time, the virus has pushed refugees and their livelihoods deeper into a state of volatile precarity, particularly in camps and informal settlements that were already suffering from inadequate healthcare infrastructure, food insecurity and a lack of decent work. However, the long-term consequences for food security may prove to be even more dire than the health impacts of the virus, with more than 270 million people expected to be in acute need of food support by the end of the year, and the pandemic potentially causing 6,000 child deaths every day.

While the direct health impacts of Covid-19 are significant, the indirect impacts caused by preventive measures such as stay-in-place enforcements, the closing of borders and disruptions to supply chains, are also having an immense toll on vulnerable populations.

Response to the pandemic has varied widely. Nonetheless the general global consensus maintains that some blend of political will and technological innovation will be needed to respond effectively and efficiently to the crisis. While new advances in and uses of digital technologies have become indispensable tools in the global fight against the pandemic, political recognition of its disproportionate impacts should in theory help to steer resources to those who most need them, including through innovation processes. However, the nature of these resources is, needless to say, complex. Early on, we saw dire shortages of personal protective equipment (PPE) for nurses and doctors. This was due, however, to a lack of logistical preparedness, not an absence of the proper technical knowledge and capacity. As the pandemic matures and assumes more complex forms, and as countries attempt to

transition back to normal social and economic life, the technologies being developed are far more advanced than face masks. Much of the resulting disarray is fomenting a state of emergency, which both state and non-state actors are using to push technological innovation and social experimentation.

In this report, we explore some of the innovative pathways for responses to the pandemic based on desk studies and interviews with key stakeholders.³ We examine selected examples of smartphone apps, artificial intelligence (AI), crowdsourced data, unmanned aerial drones and many other innovations being implemented by public and private actors to strengthen access to essential healthcare, reduce inequalities, ensure food security and support human rights. We consider these in relation to three particular groups and fields that have been especially vulnerable to the pandemic: women's health and rights; refugees, migrants and IDP education, livelihoods, and employment; and sustainable food security. Certain caveats obviously apply, as it is visibly impossible to cover more than a fraction of the innovations being pursued during the pandemic, just as this report can never provide more than a snapshot of current ways of working and thinking, not least since the pandemic itself is a moving target, as the virus and its effects are transformed. As the study is not exhaustive, we acknowledge that it possesses shortcomings and blind spots because of the choices we have made. Though we highlight and justify the relevance of our three thematic areas, there certainly exist others which would be equally noteworthy.

The path the we have chosen and the recommendations we propose reflect to a great extent the concerns and experiences that have been conveyed to us from engaging with and interviewing key stakeholders in innovation processes, from global staff in multilateral development organisations to on-the-ground innovators. As such, they are indicative of the realities that are currently afflicting effective responses to the pandemic in our key areas of focus. Furthermore, the recommendations are aimed at informing these actors' 'techvelopment' agendas, as they begin look past the immediate crisis and into the future of shaping the innovation agenda. The purpose of the report is thus to use the sparse evidence and knowledge available on innovation-related responses to the pandemic thus far to initiate a discussion of what can be learned for use in both the short- and long-term futures of techvelopment – that is, the application of innovation and technology to further development and human progress. Following an analysis of the three selected areas mentioned above, we provide a set of recommendations for future efforts of innovation in development and humanitarian affairs.



COVID-19: IMPACT AND INNOVATIVE RESPONSES

The disproportionate implications of the pandemic and the preventive measures that have been adopted to combat it are having grave consequences for the world's vulnerable populations. In this unprecedented situation, responses and proposed solutions to the pandemic have come from across the board. In this section, we explore a subset of these innovation-related responses within three major thematic areas, where the unequal nature of the pandemic's human costs is most pronounced: women's health and rights; refugees, migrants and IDPs; and food (in)security. In each of the following sections, we first explore the implications of Covid-19 for the particular group or field before going on to discuss selected innovations that have been introduced or implemented in attempts to mitigate the effects of the pandemic.

WOMEN'S HEALTH AND RIGHTS

The pandemic has put healthcare and humanitarian response systems to the test, many of which were already hard-pressed pre-crisis. Following the outbreak, support to public health measures has been critical in suppressing transmissions and saving lives. In this context, tangible limits to resources entail that certain services deemed 'non-essential' have been hit, with funding, staff and technologies being siphoned off to other, more 'essential' services. This is particularly critical because the indirect health implications of the pandemic (i.e. other than transmission of the virus itself) are proving problematic far beyond the direct implications in many countries. Here, we focus particularly on the impact of Covid-19 on SRHR and sexual and gender-based violence (SGBV).

Women's and girls' sexual and reproductive health and rights (SRHR) seem to have systematically fallen victim to this reorganisation of resources, having been already challenged pre-pandemic because of concerted efforts to roll back rights to SRHR services. USAID's acting administrator, John Barsa, recently called for the UN to remove references to SRHR from its Covid-19 response plan, stating that it 'cynically [places] the provision of "sexual and reproductive health services" on the same level of importance as food insecurity, essential health care, malnutrition, shelter, and sanitation.⁴ Early studies estimate the effects of the Covid-19 pandemic on SRHR to be devastating in low- and middle-income countries.⁵ Previous disease outbreaks such as SARS, Ebola, and H1N1 required a shift of medical personnel and resources to virus containment and treatment functions, with SRHR services taking a major blow.⁶ Already in the initial phases of Covid-19, Marie Stopes International (MSI), one of the largest SRHR organisations in the world, was forced to close its Nepal and India operations after strict lockdowns were introduced by the respective governments.⁷ Elsewhere, the International Planned Parenthood Federation was forced to close roughly 14% of its mobile and static clinics – including in some of Danida's priority countries.⁸ Because of the strong impact of the pandemic, access to abortion services, contraceptive consultations, STI/HIV testing and even pre- and post-natal check-ups have all been reduced.

The reality regarding SRHR imposed by Covid-19 in many areas is one of uncertainty – uncertainty regarding access to healthcare, to contraception and to credible information.

The reality regarding SRHR imposed by Covid-19 in many areas is one of uncertainty – uncertainty regarding access to healthcare, to contraception and to credible information. However, it is not just the closing of clinics which is endangering the progress made in sexual and reproductive healthcare and rights: border closures and stay-at-home mandates have also had major impacts. So too have disruptions of supply chains for contraceptives: 'The Covid-19 pandemic is already having adverse effects on the supply chain for contraceptive commodities by disrupting the manufacture of key pharmaceutical components of contraceptive methods or the manufacture of methods themselves (e.g. condoms), and by delaying transportation of contraceptive commodities.'⁹ In as early as March, imports of intrauterine devices (IUD) into Iran came to a complete halt after border restrictions were placed on transport, while in Mozambique, condom import times doubled from

two months to four.¹⁰ This was in large part because of import-export restrictions placed on progesterone products in India and condom factories shutting down in Malaysia.¹¹ As the pandemic worsens, access to all forms of contraceptives will continue to decline, affecting especially developing countries with weak supply chains and even weaker stocks of contraceptives.

Since the onset of mandatory lockdowns and stay-at-home orders, spikes in sexual and gender-based violence (SGBV) have been reported all over the world. During the month of February 2020, a police department in China reported that cases of domestic violence had tripled compared to the same month the year before, with some estimating that more than 90% of these were due to the Covid-19 lockdown.¹² In the UK, domestic abuse-related deaths between March 23 and April 12 were more than double the ten-year average, some of them the deaths of children.¹³ Much of this increase in violence has been attributed to the widespread quarantine orders forcing families to stay at home,¹⁴ as well as increased stress due to job losses and a lack of access to mental healthcare.¹⁵

The lockdowns have also led to setbacks to other initiatives which otherwise have been making slow but steady gains over the past years. The United Nations Population Fund (UNFPA) anticipates a 1/3 reduction in progress made towards ending female genital mutilation (FGM) in the world by 2030.¹⁶ As many households have been under financial strain, '[Kenyan] girls are being cut by the dozen as parents look to gain financial security during the pandemic [...] using school closures to cut them and marry them off.'¹⁷ In Somalia, reports of families abstaining from seeking medical attention for cut and bleeding girls have risen, as many are afraid of contracting Covid-19 at clinics and hospitals.¹⁸ Although FGM is illegal in both these countries, the pandemic has created a dangerous situation for the millions of girls who are now being forced to stay at home with their families. But such violence is also structural, manifesting itself in policy and a lack of action. Women, for example, make up more than 70% of the world's healthcare workforce.¹⁹ Being placed at the front lines of the epidemic has systematically exposed them to the virus at higher rates than for men. A lack of preparedness by hospitals – punctuated by images of nurses and doctors wearing garbage bags in place of proper personal protective equipment – and other emergency response situations thus represent a structural and systematic affront to the rights and protection of those women who are playing an essential and outsized role in combatting the pandemic.

The role of tech and innovation in addressing SRHR and SGBV challenges during Covid-19

With lockdowns in effect, devising methods to carry out necessary functions at a distance have become priority number one in all sectors, not least in healthcare. eHealth functions of telemedicine and mHealth have been developed or appropriated further during the pandemic, practiced as they are through 'mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices.'²⁰ These forms of mHealth are taking advantage of the growing number of individuals with access to mobile phones and the internet to spread relevant health information and services. Providing tailored consultation through digital mobile platforms has been one of its most crucial functions in the age of apps and smartphones. In this context, a major advantage of mHealth has been the expansion of SRHR services.

By placing the reality of local environments and individual lockdown policies at the centre of programming, innovative solutions are likely to become more effective.

While many of these traditionally require in-person visits, the distance and mobility of mHealth can potentially provide secure primary consultations, especially for those who may be at greater risk of severe illness or death from the virus, such as pregnant women or individuals with HIV or other immunocompromising illnesses.²¹ In their Covid-19 response plan, Marie Stopes International has set out concrete steps for governments to take to mitigate the effects of the pandemic on SRHR, including 'allowing women to access safe abortion and contraception remotely via telemedicine.'²² These services, taken together, could help to eliminate the additional 5,000 to 11,000 pregnancy-related deaths or 1.2 to 2.7 million unsafe abortions that are estimated to have ensued in the wake of the pandemic.²³ mHealth initiatives have proved successful in providing pregnant women and nurses with credible information, not least through the Danish NGO Maternity Foundation and its Safe Delivery app that is scaled across numerous countries and provides birth attendants with clinical guidelines.

m-Assist, a randomised control trial conducted by the Women's Health Research Unit at the University of Cape Town, found that 'the combination of information, self-assessment and support provided via mobile phones reduced the need for follow-up visits by clients; enhanced the experience of medical abortion; reduced demands on abortion providers; and increased post-abortion knowledge,' all of which 'effectively reduced their anxiety around abortion.'²⁴ Providing these services for women during and after the pandemic is essential. Not only can it relieve the demand on healthcare systems and SRHR specialists, it can also help reduce the anxiety experienced by women at a time when loneliness and other mental health disorders are disproportionately affecting women.²⁵ The same South African study, however, demonstrated the need to appraise local dynamics and the effects they may have on mHealth programs. For example, present-day legacies of apartheid have left major racial divides in the social fabric of the country, limiting access for black (and largely rural) women to mHealth services. Similarly, conservative policymakers frame SRHR as an issue solely of pregnancy and motherhood, leaving the more 'politicised' topics – 'sexuality, abortion, gender-based violence, sex-positive messaging and teenage sexual pleasure' – untouched.²⁶ This calls for a need to incorporate local realities into the discussions at both the policy and practical levels.

As already noted, the disruption of SRHR services by supply chain-related issues is also widespread, having become a complex logistical question, with many economic, political and practical variables at play. However, some innovations are attempting to circumvent these restrictions altogether. SafePad, a reusable, anti-microbial menstrual pad, has been supported by Response Innovation Lab to make up for the cutting off of menstrual products to refugee camps in Iraq.²⁷ It has already shown some success in trials and could be significant in guaranteeing good reproductive health to women and girls despite disruptions to the supply chain. Not all innovations, however, need be so tangible. One process innovation – crowdsourcing – offers an innovative way to overcome the barriers to accessing commodities and resources made scarce by the disruption of supply chains. This technique is already being widely used via apps and SMS messaging²⁸ to monitor and map outbreaks of diseases such as malaria and dengue fever.²⁹ UNFPA is also supporting a crowdsourcing initiative to map routes to safehouses for girls fleeing female genital mutilation (FGM) in Tanzania.³⁰ By compiling data from crowds, large amounts of information can be amassed and acted on more swiftly, potentially helping to maintain a steady flow of contraceptive options to both women and men.

Studies mapping access to contraceptives and other essential healthcare services in geographically concentrated areas do exist.³¹ While these studies may fuel policy and academic discussions, they are widely inaccessible to those who require such services. Instead, more accessible tools are being created to widen access to such information. For example, PRB, a research and advocacy organisation focusing on population statistics, reproductive health and family planning, has created a Google Maps tool giving the location of contraceptive availability and resources in Kawempe Division in northern Kampala, Uganda.³² The tool not only maps the locations of clinics, but also provides information on the contraceptive methods and SRHR services offered at each, so that both women and men can choose the clinics and contraceptives that are best suited to them. Through crowdsourcing, information on databases and tools such as these could be communally curated in real time to remain up to date, not least at times when access to health services is limited. An added advantage is that this system can capitalise on technologies that are already largely in place, rather than relying upon the distribution of new hardware. As crowdsourcing techniques continue to proliferate in health research, diagnosis and care,³³ looking for innovative ways to integrate them with mHealth tools can help organisations to improve their understanding of which issues are most pressing for local communities and how best to go about assisting them. In the long term, investing in mHealth can also allow policymakers to build more robust and crisis- or pandemic-resilient healthcare systems. And while they are never likely to replace the quality and intimacy of in-person physician care and consultation, mHealth tools can provide an added level of healthcare security so long as distance continues to pose an insuperable barrier to traditional forms of healthcare. In advocacy and policy discussions, stressing the aforementioned effects of Covid-19 on SRHR will also help to support rights-based approaches to SRHR policy and programmes.

Though mHealth does offer relevant services in the fight against SGBV, particularly in relation to distanced mental health consultations and group support, broadening the scope beyond mHealth technologies can help incorporate more localised understandings of culture and innovation into the fight against SGBV. Despite the uptick in calls experienced by many domestic abuse hotlines and SGBV organisations since the onset of Covid-19, others have noted a sharp decline. This decline, however, has been interpreted as a sign that survivors trapped at home cannot reach out through traditional means, such as mobile phone hotlines and internet forums.³⁴ As SGBV is very often an immediate threat to the life of the individual, initiatives cannot wait for equal access to mobile phones to materialise. This echoes work by UNICEF: 'The first stage of ensuring survivors can access support, is to design a system and process through which they can safely request

help without their abusers knowing, and that is not dependent on their ability to own a phone.³⁵ That means considering no- and low-tech solutions such as 'signal alerts [...] code words, whistles/alarms, placing innocuous objects outside the home e.g. a certain coloured cloth/bucket.'³⁶ These systems can alert providers or community members working with organisations, who can then provide help and refer survivors to the proper services.

These solutions are no less innovative just because they do not incorporate advanced technologies; more so perhaps since they adapt and speak to the challenges faced by specific communities. By placing the reality of local environments and individual lockdown policies at the centre of programming, innovative solutions are likely to become more effective. For example, in Peru and Panama, the gender-based lockdown policies that have been put in place during the pandemic, which from one perspective prove discriminatory,³⁷ may very well from another perspective prove advantageous. As women may currently be able to remove themselves from their male abusers, this may provide them with an opportunity to reach out for help. Using the lessons highlighted by Covid-19, moving forward SGBV programmes must continue to include these local policies and dynamics in their initiatives, employing only the proper technologies selectively and with discretion. In light of these findings, digital solutions to disruptions to SRHR and SGBV programming should only be operationalised in areas where they can, within reasonable belief, be realised in an equitable manner. Otherwise, adopting no- and low-tech solutions may be better suited to the task, while focusing innovation capacity on procedures that help to reach women with these strategies.

Countries are becoming acutely aware that, when citizens cannot get access to relevant and trustworthy information and services, it only prolongs the economic and health effects of the crisis.³⁸ However, the availability of all of these innovative tools and strategies above – many of which are designed specifically for women – makes it crucially important to address the digital gender divide that sees some 400 million women still unconnected to a digital reality that allows eHealth services to reach them. Covid-19 has demonstrated more than any other event in recent history that unequal access to technology only perpetuates and maintains existing inequalities, not least gender inequalities. While continuing support for women's access to STEM programmes and other technical and vocational schools is crucial, Covid-19 shows how the severity of many women's issues cannot wait for equal access to digital technology and education. This calls for the need to support the role of women in process innovation, particularly in relation to localised solutions to SRHR and SGBV issues. Process innovation relies not on an intimate understanding

of and access to digital technology, but rather of the problems faced by communities and the easiest ways to reach those most affected. For donors in particular, this means creating and maintaining partnerships which accentuate localised process innovation in SRHR, SGBV and other women's rights and gender equality initiatives.

REFUGEES, MIGRANTS AND IDPS: EDUCATION, LIVELIHOODS AND EMPLOYMENT

The humanitarian needs involved in countering the detrimental effects of Covid-19 are immense. In March 2020, the UN launched a \$2 billion coordinated global humanitarian response plan, which was revised in May to include an almost \$7 billion appeal and grew again July to a \$10 billion appeal. Denmark has been a major provider of extraordinary support, with 650 DKK million being committed in April 1st, but as of September 25, overall the global response plan has still only received 27 percent of the total funding required.³⁹ Being both the greatest humanitarian crisis since WWII and the greatest health crisis in history, Covid-19 represents an inhuman challenge to the world's 300 million migrants, refugees, IDPs and stateless people. For people living in informal settlements, such as migrant and refugee camps, or areas of active conflict, the current situation tragically presents a double burden. The lethal effects of the pandemic can and will have an immense impact on these population groups, as will effective lockdown measures and Covid-19 prevention measures. Most migrants, refugees and IDPs are not able to follow the recommended preventative measures, such as social distancing, frequent and thorough hand-washing or use of protective equipment, just as they do not have access to healthcare, WASH or decent living conditions. Water taps usually serve more than a thousand persons, isolation regularly takes place for entire families in tents only a few square metres in area, and most camps accommodate far more refugees than they were built for (the Lesbos camps host more than twenty thousand refugees, although they were built for only three thousand). Refugees, migrants and IDPs face similar challenges as others during the pandemic, but these are exacerbated by immense increases in SGBV, broken social protection, breakdowns in mental and psychosocial health (MHPSS support has more than doubled in many refugee camps during the initial months of the pandemic), and educational shortfalls, with schools closing everywhere (at least eight million refugee children have had their education disrupted). Food prices are soaring in many places, creating a global food emergency that drives malnutrition, as famine prevention cannot keep up with needs.

The number of confirmed cases of Covid-19 among refugees and displaced populations still remains fairly low, though it is growing, with confirmed cases having been reported in Daadab (Kenya), Cox's Bazar (Bangladesh), Syria, Yemen and elsewhere. However, a lack of adequate testing and tracing services means a close watch is being kept in vulnerable places. This is not least the case because adequate healthcare services, whether in the form of information, prevention or treatment, are scarce in overcrowded shelters and camps, particularly among IDPs and irregular migrants in fear of deportation. In the event that massive transmissions of the virus should occur, there are few realistic options for responding to and controlling the pandemic. Moreover, reports have come in from places such as Cox's Bazar, where many Rohingya communities have opted not to be tested and are avoiding treatment because of the perception that informing the authorities about possible transmissions could have a negative impact on the community's protection and safety.

While the health impacts of Covid-19 are potentially devastating for refugees, migrants and IDPs, the livelihoods and employment of these are perhaps taking an even greater toll from both preventive measures and the effects on economies.

During the pandemic, teachers, students and educational administrators have been confronted with a sudden challenge: moving all education online. For countries and communities with more expansive and inclusive digital infrastructure, the tools to make this shift possible were mostly already in place. As we have seen, however, not everyone has equal access to quality digital infrastructure. Of the school-age refugee children under UNHCR's protection, roughly 3.7 million are without education, or more than half.⁴⁰ And though these numbers have improved since 2018, the pandemic has put that progress in jeopardy: the longer you are away from school, the less likely you are to return, meaning that the current crisis in education among refugees caused by Covid-19 will have long-lasting effects far beyond the pandemic itself. Significant efforts have been made in recent years to integrate refugee children into national education systems, but with lockdowns and isolation, these efforts risk being erased. While this situation has affected all children to some degree, UNHCR estimates that education for refugee girls in particular is the most prone to pandemic shock: '20% of the refugee girls who are in secondary school are at significant risk of never returning to school following the Covid-19 school closures.'⁴¹

While the health impacts of Covid-19 are potentially devastating for refugees, migrants and IDPs, the livelihoods and employment of these are perhaps taking an even greater toll from both preventive measures and the effects on economies. As opportunities for freedom of movement, the right to asylum or work permits are disrupted, these groups are pushed into irregular routes (whether of outward migration or return) and more precarious avenues of work and subsistence. Both in camps and in transit, many barriers have been put in place inhibiting the mobility and protection of people fleeing danger and persecution. Travel restrictions are exacerbating the precarious situations and vulnerabilities of migrants, with stranded populations losing incomes and having no prospect of residence permits giving them the option to travel on. This is combined with growing concerns over stigma, xenophobia and discrimination in light of the pandemic, not least the massive extra toll the pandemic is having on women and girls by way of increased insecurity, abuse during lockdowns and other vulnerabilities, as shown in the previous section. The positive news, such as it is, is that more than 25 million refugees, IDPs and migrants have received Covid-19 assistance. Moreover, according to the Mixed Migration Centre, the proportion of refugees and migrants taking preventative measures against Covid-19 has been steadily increasing.⁴² Likewise, fewer respondents are reporting losses of income or reductions in the availability of basic goods. Nonetheless, the pandemic has proven hard to predict in its development, just as its aftermath will be felt for months and years to come among vulnerable populations. In this situation of frustration and bleakness, where all improvement measures are welcome, innovations and tech-related avenues of progress are being pursued for their potential to engage with hard-to-reach populations and groups, offering alternative means of communication, interaction, education and assistance in relation to the effects of the pandemic.

Tech solutions in refugee education, livelihoods, and employment

What is being done to ensure primary, secondary and tertiary education for refugees – particularly girls – during and after the crisis? Existing pre-pandemic initiatives include Vodafone's Instant Network Schools programme in collaboration with UNHCR. Set up in 2013, the programme is being run in eight refugee camps in East and Central Africa, offering access to quality and localised digital education content. Speak is another company focused on language learning for immigrants to help them integrate into communities. Active since 2014, it was the pandemic that finally challenged Speak to move its language groups into the digital domain, thus providing a contribution to the fight against social isolation through a 'pay what you want' scheme. In Turkey, since early 2019 UNDP has been piloting a programme of so-

called 'blended learning' in which conventional and digital tools are combined to provide a holistic approach to teaching. The learning management platform, which includes virtual classrooms, evaluation systems and learner analytics, works across all devices and is combined with flexible and adaptive in-classroom teaching, encouraging individualised learning and giving refugees the flexibility they need to have an education suited to their everyday lives. The flexibility inherent in the system has given UNDP Turkey the option of moving everything online during Covid-19, while its users continue to use the platform they are familiar with.

Innovation does not necessarily require advanced technology: it requires the resourceful application of the technologies already at one's disposal.

The first and perhaps most natural step to be taken in distance education during the pandemic has been for teachers to try and maintain contact with students through mobile phones, whether through WhatsApp groups, texting or mentoring over the phone. However, the issue with many contemporary mobile tech solutions is that they presuppose access to the internet, taking the form of apps, video conferencing and other mobile data-driven solutions, thereby alienating those who cannot access them. As has already been noted, access to smartphones is quite uneven across gender, race, age and socioeconomic groups. Nonetheless lower-tech mobile phones are still widely used and are more accessible to many than smartphones, as they are generally less expensive and do not require internet data plans. They therefore provide a big opportunity for educational initiatives. Rather than relying on expensive and high-tech apps, organisations such as Cell-Ed have begun providing lessons – from reading and writing to numeracy and social skills – to migrants through standard SMS messaging, all free of charge. In this way, users can in theory still learn at a distance, but via technologies that are more accessible and less expensive.

Taking a greater step away from the tendency towards 'high-tech' solutions, UNHCR has begun supporting lessons broadcast by radio in the Dadaab refugee complex in Kenya. This initiative has been particularly effective in combatting the digital divide, as radios are far more accessible than internet-enabled smartphones and other mobile devices. Compared to the 64,000 students connected to teachers in the camps via WhatsApp group chats, UNHCR has reported that the radio lessons were

able to reach more than 100,000 students only one month after schools were closed in the camps following the outbreak of the pandemic. Even though not all students may have access to a radio, many have been able to sit together, even at a safe social distance, to ensure the continuity of their education throughout the crisis. The one problem with radio transmissions is that they require listeners – in this case schoolchildren – to come together at the exact time at which the broadcast starts, something that may not be viable in a context in which many of these children have responsibilities towards their families and unpredictable days. In Uganda, Response Innovation Lab has been testing solar-powered speakers that can carry built-in messages, which may then be played again and again. This makes it more realistic for a group of children or even individual children to play back training and educational messages and programmes when they see fit. Innovation does not necessarily require advanced technology: it requires the resourceful application of the technologies already at one's disposal.

Though some distance-learning platforms have proven a useful tool in sustaining access to quality online lessons and other learning tools, the relationship goes both ways: the global transition to e-Learning has also opened up the rest of the world to new sources of knowledge and information provided by refugees, migrants and IDPs. Through digital platforms, students and learners are now able to receive an education from the thousands of educators and professionals who belong to the global refugee and migrant community.

As elsewhere, the first challenge is to reach vulnerable end-users. The second challenge is what you reach them with.

The majority of refugees, migrants and IDPs live in low- or middle-income countries with weak systems of social protection, meaning that economic shocks will affect them harder than anyone else, partly due to pre-existing vulnerabilities such as a lack of permits and the right to work or to other legal and practical barriers. As scarcity leads to increased competition (and host communities are suffering a loss of livelihoods generally) exclusion from labour markets is inevitable, especially for the many precarious jobs in the informal sector, where refugees are employed in transient and temporary roles. Those who retain employment often do so at reduced wages and in low-quality jobs, far from the principles of decent work, and are not able to receive employment benefits, insurance or pensions, while greatly increasing the risks of transmission for themselves and their families. The pandemic's

socio-economic impacts affect food security, access to basic needs and shelter, causing a steep rise in the number of refugees who are dependent on humanitarian aid and who adopt negative coping mechanisms like skipping meals.

In Iraq, the UN has reported that 89 per cent of 1,500 respondents to a monitoring survey said they had suffered a loss of employment or livelihoods during the start of the pandemic, while in South Africa, 95 per cent of calls requesting UNHCR support are from families that were previously self-sufficient. Syrian refugees have also had their livelihoods taken away, with Syrian refugee women being hit more drastically than men, as 61 per cent reported losing their jobs due to Covid-19. These sorts of lost livelihoods and employment are difficult to recover through humanitarian innovation, being far too rooted in the wider socio-economic context. Online work is surging globally, even though it rarely amounts to decent work, yet it requires both specific skills and access to technology. Refugees are 50% less likely than the general population to have an internet-connected mobile phone, and access to the internet in, for example, urban centres does not mean that refugees can afford to use it.

As elsewhere, the first challenge is to reach vulnerable end-users. The second challenge is what you reach them with. Financial exclusion is a major problem for refugees, migrants and IDPs, so dependence on humanitarian aid signals that COVID-resilient means of delivery become important for livelihoods. Cash-disbursement systems, including those based on blockchain infrastructure, have proven resilient at times when even UN staff are having their mobility restricted, making reaching the most vulnerable even more difficult. The WFP IrisGuard biometric systems in place in supermarkets (as in the Azraq camp hosting Syrians in Jordan), which requires no physical contact and can be operated from a safe distance, is demonstrating its effectiveness in a situation such as this.

On top of this there have been efforts to introduce further surveillance and monitoring with the aim of providing protection and aid by making the specific presence of vulnerable groups evident. As far back as 2013, the Swiss NGO Medair developed an Inter-Agency Mapping Platform (IAMP) to identify and map refugees living in informal settlements: this is now being put to use together with ECHO and UNHCR to try and increase coordination between Covid-19 relief efforts. Techfugees has also launched an open-source platform to map the impact of the pandemic on displaced communities. Single inventions or pilots are far from sufficient, however, dealing as we are with the long haul of not fixing employment during the pandemic, but rather addressing the root causes of barriers to employment that most refugees,

migrants and IDPs face. These solutions reflect a critical need to consider the context in which these groups are experiencing the pandemic. These are not contexts in which a smooth shift to remote working or more frequent hand-washing is viable, but rather in which their already limited mobility is being threatened – a mobility they rely on to work, learn and pursue opportunities.

SUSTAINABLE FOOD SECURITY AND COVID-19

The pandemic could increase the number of people at risk of acute food insecurity by the end of 2020 to 265 million people globally.⁴³ In areas that are already struggling with food insecurity, whether due to climate change, pestilence, conflict or some combination of these factors, access to sufficient nutrition has become increasingly difficult during Covid-19. Moreover, as people all over the world became unemployed overnight, many new groups have been pushed into nutritional precarity, as they now struggle to attain a minimum caloric intake for sustenance. Naturally, we are seeing an overlap in those countries where the majority of such people are situated and the countries where access to healthcare is limited. In South Sudan, more than 61% of the population was already in a state of food crisis in 2019.⁴⁴ In the same year in Yemen, 15.9 million people were classified as in need of food, nutrition and livelihood assistance.⁴⁵ In Nigeria, prices for some foods have almost doubled since the onset of President Buhari's pandemic lockdown measures in the capital region.⁴⁶ One report found that the price of rice alone jumped by 30% over the span of only four days in March.⁴⁷ These price increases are being accompanied by border closures, transport shutdowns and reductions in access to credit for farmers, all of which contribute to greater food insecurity.

The same dynamics that contributed to the weakening of medical supply chains discussed earlier – export restrictions, general scarcity, domestic hoarding, etc. – have likewise exacerbated pre-existing food insecurities all over the world, all the while creating new vulnerabilities.

Across the continent, countries in East Africa are currently experiencing what many have called a 'triple threat': Covid-19, swarms of desert locusts and deadly flooding.⁴⁸ Each of these factors alone jeopardises food security anywhere they may occur: all three of them together spell disaster, not least in a region already afflicted by

malnutrition and hunger. The desert locust consumes the equivalent of its body weight every day in vegetation in a diet ranging from flowers, leaves and bark to corn, rice and millet, many of which are staple crops in the region upon which many humans are dependent for their livelihoods and nutrition.⁴⁹ The onset of a global pandemic has only added logistical difficulties to the fight against these natural disasters by choking off transport lines and access to resources.

The same dynamics that contributed to the weakening of medical supply chains discussed earlier – export restrictions, general scarcity, domestic hoarding, etc. – have likewise exacerbated pre-existing food insecurities all over the world, all the while creating new vulnerabilities. While less examined than the crises of medical supply chains leading to insufficient supplies of PPE and medication, issues threatening food security are often more complex, depending greatly upon environmental factors such as climate change and pest control or shipping constraints related to perishability and temperature control. Furthermore, global food supply chains are directly linked to the livelihoods of smallholder and contract farmers, many of whom have been cut off from global markets during the pandemic. Nonetheless, in this context, the global tech community has been active in promoting the advantages of innovations in the fight against food insecurity.

The role of tech and innovation in addressing food security challenges during Covid-19

In light of Covid-19, the UN recommends increased reliance on and support to 'remote sensing, artificial intelligence and other available real-time data to monitor the health and intensity of cultivation, density of population in aggregation points and marketing centres, and accumulation of food spoiling and waste.'⁵⁰ AI tools are extremely good at adapting to changing circumstances through their ability to learn constantly from new data inputs, and they have become progressively more important in the fight against global hunger. It was in response to the complexity of food security monitoring that WFP launched its new AI-driven project, HungerMap LIVE.⁵¹ The HungerMap 'monitors food security in more than 90 countries and issues predictions for places where data is limited.'⁵² It assembles data and indicators from various sources such as 'hazards data from the Pacific Disaster Centre, population data from the World Bank to vegetation data from NASA' to provide a real-time picture of food security hazards around the world. Further data on conflict is provided by the Armed Conflict Location & Event Data Project (ACLED), which reports the location and frequency of explosions and battles on a daily basis. All of this information is coupled with data from live calls through call centres, which help create an on-the-ground picture of the food security situation. These indicators

and data points are fed through the XGBoost gradient-boosting machine-learning algorithm to help pinpoint the areas that are most vulnerable to acute food crises. Since the emergence of Covid-19, HungerMap LIVE has also been tracking outbreaks of the virus as part of its predictive tool. By mapping where cases and hotspots emerge, the innovative algorithm can improve understanding of Covid-19's links to the other relevant indicators and therefore better predict instances of food insecurity.

Most of the technological innovations that have been put to use during the pandemic are largely pre-existing ones.

Other forms of big-data analysis are proving fruitful in providing access to food while still protecting farmers and others employed in agriculture during the pandemic. CGIAR, the Consortium of International Agricultural Research, has multiple such initiatives underway. One approach is to employ commercial satellite imagery for various uses, such as 'monitoring and predicting food flows, and understanding relevant changes in land use.'⁵³ The Famine Early Warning Systems Network (FEWS NET) is using similar data practices, as well as remote sensing, to detect areas that are most vulnerable to famine and acute food insecurity in the Covid-19 context, particularly in relation to changes in cross-border food trade and population flows.⁵⁴ In mid-June, Digital Earth Africa made its continent-wide, 'analysis-ready' satellite data publicly available to inform decision-making on water accessibility and larger environmental changes in the crisis.⁵⁵ These major initiatives in big-data collection all contribute to the advancement of artificial intelligence, which can continue to create more accurate pictures of the environmental and human risks that are exacerbating food insecurity during the pandemic.

The remote sensing and AI tools described above offer a unique edge when paired with drones, among other advantages. More often than not, much of the crop and weather monitoring data that feed into AI algorithms originate from satellites, as has been standard practice for years now. Increasingly, however, drones are being used to collect low-altitude data with greater accuracy than satellites.⁵⁶ One drawback of this greater accuracy is that longer data-processing times are often needed. However, drones can be more useful in times of crisis, as they can be steered to regions which may be particularly prone to disaster, thus providing more detailed overviews of areas that are vulnerable to flooding or locust swarms. Outside of data collection, unmanned aerial drones have many potential uses in a food

security context, some pre-emptive and others reactive. One major pre-emptive application has been their use to examine large tracts of land for early locust detection, thus anticipating the formation of the biblical swarms that aggravate locusts and devastate crops. Other responses, such as spraying pesticides, have already been widely implemented all over the world as a low-cost alternative to manned aerial crop-dusting.

As with most new technologies, drones are not without limitations and drawbacks of their own. One is the start-up cost of their use and the level of expertise needed to employ them efficiently and safely. Another is the degree of registration needed with the local aviation authorities: the establishment of domestic flight corridors is often required.⁵⁷ Moreover, harsh desert environments, not to mention the locusts themselves, can damage drones.⁵⁸ There are other psychosocial implications, such as their use in conflict zones where a community's experience of drones may have long been associated with airstrikes.⁵⁹ Of course, all of these variables must be weighed and considered by local authorities and organisations in their potential pandemic uses – those who best understand how they may be deployed in particular environments, as well as the practical and social limitations on their effective implementation.

Mitigating food security often requires the costly and highly advanced technologies described above. Throughout this report, however, we have examined the many ways in which smartphones and personal mobile devices are being used to provide new services which may help level the playing field. This is also occurring within food security. Chowberry, a Nigerian non-profit tech company, touts an innovative way to get the most out of the limited food that is available. Chowberry's online platform tracks foods which are near expiry and lists them at a discounted price: 'the closer to expiration, the bigger the price cut.'⁶⁰ By doing so, it prevents food waste in a country with already low stocks of food. This localised innovation incorporates the reality of the digital divide directly into its business model. With an intimate understanding of exactly who hunger affects the most and the technological limitations imposed upon them, Chowberry has been able to couple technology and partnerships to circumvent both logistical and political barriers. Now, in response to Covid-19, the organisation is proceeding with its normal operations, but is also expanding its scope to provide PPE to NGO volunteers, as well as to facilitate the transport of foodstuffs, a service which has been severely curtailed by the pandemic. Chowberry thus serves as a relevant example of the assertion made early on in this report: that if technology is to provide an effective

response to Covid-19, it must necessarily be rooted in the local political realities of the community in which it is being employed; anything else risks wasting resources and prolonging the effects of the virus.

While few of the technologies reviewed above were developed specifically to fight Covid-19, through strategic partnerships and innovation their developers and users have been able to adapt them to changing local and global circumstances potentially to provide food security for those at high risk during the pandemic. And though they will remain in use both inside and outside the context of Covid-19, the primary lessons to be drawn from their application is to reiterate the claim that most of the technological innovations that have been put to use during the pandemic are largely pre-existing ones. What is needed is rather their appropriation for a new context and a new set of challenges, such as those posed by the pandemic.



COVID-19 AND FUTURE PATHWAYS FOR TECHNOLOGY AND INNOVATION IN HUMANITARIAN AND DEVELOPMENT WORK

The nature of the current pandemic and the preventive measures taken in its wake have followed a two-way street of innovation: inventing new innovative solutions for issues across health, education, rights, food security and many more, as well as amending and scaling existing solutions. Though the virus is a moving target, we have tried to open the door briefly to see what current lines of thinking and acting within the technological and innovation spheres during Covid-19 tell us about how we pursue humanitarian and development innovations in the first place. In the following, we sketch out five recurrent lessons that have been revealed by the pandemic and were reiterated by our interviewees, all of which provide future pathways for techvelopment.

Localise innovation in programming

Covid-19's disproportionate effects provide a textbook case for revisiting questions of who is allowed to innovate and when those innovations become truly relevant for their intended beneficiaries. We know that innovation stems from the logics inherent to business and competition and that industry and financial capital tend to be densely situated in urban, cosmopolitan areas with vibrant markets. Despite this, relativity in humanitarian work can cloud interpretation of concepts like 'local' and 'participatory' innovation. By working with innovators in Kampala, organisations may believe they are automatically incorporating local perspectives into their programmes. However, they could just as likely be skirting the fact that life for many educated, successful business innovators in Kampala in all likelihood is closer to that of Danish humanitarians than to that of marginalised communities in rural Uganda. When discussions about 'ecosystems' in innovation become discussions

about linking urban tech innovators with donor organisations and other philanthropic foundations, it is worth asking how truly 'localised' solutions borne of that relationship are. For example, a 2017 report showed that 90 percent of venture funds in East Africa go to expatriate founders.⁶¹

Innovations in the sector should thus not only reflect local needs, but build upon and develop local perceptions, competencies and skills.

Proposed innovative solutions must be relevant, effective and sustainable. Covid-19 has resulted in quarantine policies differing from country to country, municipality to municipality, and village to village. To ensure this relevance, programmes responding to increased GBV need to understand how local policies may be innovatively acted upon so as to reach those women who are at the greatest risk of abuse. Similarly, they need to understand the unique and complex ways in which these local policies may disrupt links in the innovation ecosystem, such as the cut-off of inputs of knowledge from beneficiaries. Innovations in the sector should thus not only reflect local needs, but build upon and develop local perceptions, competencies and skills. That means linking local needs and solutions with global ones in ways that foster indigenous innovation, thus moving from isolated top-down projects to solutions that are both locally sustainable and capable of being scaled. Whether we call this human-centred design or indigenous or participatory innovation, the aim is to put local systems at the heart of the innovation process.

Prioritise process innovation over 'things'

Covid-19 has shown a discord between the different technologies and forms of innovation that are touted in official reports and incubation seminars, and those that are often called for in practice. In many environments, technological innovation seems to have reached a critical mass, with many reasonably applicable tools already available to those organisations that need them. As one country director for innovation told us: 'We don't need more stuff. We need process innovations to give us a better way to use what we already have.' Process innovations – that is, innovations in communication and organisation between innovators and beneficiaries – are in low supply and high demand. Though traditionally less attractive to donors than projects that propose the development of cutting-edge

technologies, strategies that highlight innovations in existing processes and communication need to be prioritised, as they will allow organisations to make better use of the tools that are already abundantly at their disposal.

Strategies that highlight innovations in existing processes and communication need to be prioritised, as they will allow organisations to make better use of the tools that are already abundantly at their disposal.

To foster better process innovation, donors must invest in building robust innovation ecosystems. Such investments can go a long way in connecting the tools that already exist with the actors who can address the issues plaguing communities. By finding new ways to connect innovators and local beneficiaries – or even better, to bring local communities and beneficiaries, especially women, into the innovation process – the technologies that have been developed so painstakingly are better equipped to induce change. Some of these ways include, but are not limited to:

- **Facilitating openness and ease of knowledge flows from beneficiaries to innovators and from innovators to beneficiaries.** How intimately and with what tools are networks connected? Through which actors and means can we promote local involvement and the co-creation of solutions?
- **Creating a unified strategic vision for the development of process innovation capacity.** Can open-source dissemination of successful solutions help unify best-practice approaches to innovation? How can we move process innovation into an organisation's core innovation activities?
- **Emphasising local knowledge when identifying better delivery mechanisms for innovative tech.** Which tech projects can be dropped to free up resources for process innovation? Which actors best understand the social and political hindrances to the successful implementation of innovation projects?

Keep inequality concerns central and explicit in innovation support and programming

The Covid-19 pandemic is a dire reminder of the grossly unequal nature of the distribution of resources, quality of life and power, whether between regions, communities or individuals. Like all other forms of programming, innovation and technology efforts are guaranteed to shape inequalities, no matter their character. The challenge becomes being aware of these effects and pushing them in productive directions to 'leave no one behind'. This entails posing questions such as who might be unintentionally affected by the innovation, whom does it bypass and how can the innovation be predicted to reshape community relations? These questions are obvious when we consider them, yet in processes of innovation they are not always made explicit. This is not least because this knowledge rarely rests with those who hold the technical knowledge to produce the innovation, stressing the importance of seeing innovation processes as hybrid ones in which different competencies and experiences are brought together to create optimum solutions. To strengthen their impact and ensure a productive effect on existing inequalities then, institutional innovation portfolios have to be more strategically focused and explicit in working from articulations of what change they aim to inspire rather than what forms of technology they may be interested in pursuing. Only by being so can they strengthen the potential for addressing existing inequalities.

Institutional innovation portfolios have to be more strategically focused and explicit in working from articulations of what change they aim to inspire rather than what forms of technology they may be interested in pursuing.

There are risks to human dignity and fairness associated with digitising and technologising during the Covid-19 state of exception. Innovation efforts can easily enforce existing inequalities if we are not mindful of their impact. If all systems move online, and if engaging with these systems becomes essential to education, mobility and general well-being, then any disruption to those systems becomes a driver of extreme inequality and the limitation of human agency. Replacing a low-tech solution with a high-tech one may generally imply increased access, but it also means limiting its use to those who have access to the enabling technology. As more than 400 million women remain 'unconnected', mobile-based solutions will likely mean nothing to them. In such a situation, new mobile ways of reaching

women with GBV information obviously needs to be mindful of also addressing the inequality of access that is present in the first place and of neither exacerbating existing inequalities and vulnerabilities, nor creating new ones.

Constant awareness of the human rights vulnerabilities of tech and innovation.

Covid-19 has led to innovations that walk a fine line between, on the one hand, protecting and even reinforcing people's rights, and on the other, putting them at further risk. When using crowdsourced data to geolocate stocks of contraceptives, how can we safeguard the identity of those who provided the information? Similarly, can doctors assure patients that their digital medical profiles will be safe if they are not trained in data protection? And what happens to the data collected when drones are used to identify areas that are particularly vulnerable to acute food insecurity? States of emergency push for action now and deliberation later, whether in situations of pandemic or regular humanitarian crises. Many technologies which would otherwise require extensive testing and regulation have made their debut since the beginning of the current crisis. The rapid proliferation of contact tracing apps has been justified by the imperative of halting the spread of the virus; it was only after their widespread use that many of their rights-infringing side effects entered public consciousness. Innovations have to be mindful of pace of experimentation and scaling vis-à-vis trying to comprehend and manage the (often unmanageable) uncertainties of suggested solutions.

Innovations have to be mindful of pace of experimentation and scaling vis-à-vis trying to comprehend and manage the (often unmanageable) uncertainties of suggested solutions.


Collecting data is of paramount importance in ensuring an evidence-based and appropriate response to humanitarian emergencies. Likewise, data protection is an integral part of protecting the life, integrity and dignity of beneficiaries. The right to privacy and to personal data protection are both human rights and inscribed in hundreds of pieces of national and regional legislation, even though uniform approaches across organisations are lacking. Relevant standards include the Resolution on Privacy and International Humanitarian Action adopted by the International Conference of Data Protection and Privacy Commissioners (ICDPPC) and many others, both inside and outside humanitarian affairs.⁶² Concerns over data protection should not be integrated after data has already been collected but rather be an integral part of programme and API design from the outset. This relates

to data-sharing practices, including with whom data is shared and under what formal and informal arrangements, particularly with external partners such as government agencies, as well as the cross-use of data inside organisations. Formal rules on the temporality of data should also be considered and established. Once collected, personal data is exceedingly difficult to erase, often circulating back and forth between individuals, organisations and countries.

Emergencies require both flexibility and adaptive programming to ensure effective responses, highlighting principles of proportionality that must always be considered where protecting human life and dignity is concerned. Nonetheless we should be careful when balancing rights with immediate needs to justify bypassing principles of informed consent, sometimes creating a preference for the latter, i.e. that it may not be 'necessary to inform all individuals of the conditions of data collection prior to receiving aid, if this would seriously hamper, delay or prevent the distribution of aid.'⁶³ This is certainly true, but this dilemma is preceded by questions concerning which data are collected and whether their forms and amounts are justifiable. It is imperative to apply data minimisation principles in programming and implementation, ensuring that only a minimum amount of personal data is processed in line with achieving the objective for which the data is being collected. This is especially important because vulnerabilities in emergencies are seldom individual but rather collective across groups or communities, as well as in relation to gender or age, meaning that processed data poses threats not only in their direct personal form, but also at an accumulated level where they can shape interventions and political action.

Innovation should continuously supplement, not replace, existing work

Innovations and techvelopment carry a promise of progress, of leapfrogging or disrupting cumbersome or bureaucratic processes, breaking old systems that maintain structural inequalities and providing a different and brighter digitised future. But innovations are also very often that: promises of potential improvements that may turn out to make a real difference in humanitarian emergencies and in development efforts. The nature of innovations is inherently both complex and non-linear, meaning they may have a positive impact tomorrow or in a year or never, something we cannot precisely predict as we pursue them. As such, they can never replace the perhaps less exciting, routine work of responding to emergencies through traditional means and interventions and therefore must always work as a supplement to existing efforts, not separately from these but rather as an integral part.



The nature of innovations is inherently both complex and non-linear, meaning they may have a positive impact tomorrow or in a year or never, something we cannot precisely predict as we pursue them.

Supplementarity does not mean that innovations only have to work and conceptualise themselves within existing systems of operation. The fundamental strength of innovations is naturally the way in which they can confront and break away from traditional ways of working, formulating a completely new reality of implementation. This property is exceedingly important to bear in mind when supporting innovations. Yet, as we have stressed, innovation is not a monolith, and many efforts regularly end up as irrelevant, imprecise or ineffective, most often because they lack contextual understanding or ask the wrong questions and consequently promote misunderstood ambitions for change. These considerations should figure as the foundation of any coherent institutional strategy for integrating innovation in programming.

CONCLUSION

The current pandemic has affected everyone, but it has not affected everyone similarly. Just like any major societal rupture, Covid-19 has created new manifestations of vulnerability and further exacerbated existing inequalities. Women, refugees, migrants, IDPs and those living in areas prone to food insecurity have all been disproportionately impacted by Covid-19, as well as the preventive measures put in place to curb the pandemic. In some countries, patriarchal structures are being reinforced through the acceleration of FGM; in others, the crisis is being mobilised as a propagandistic weapon of hate and xenophobia against refugee and migrant groups. Globally, high-income countries have hoarded medical supplies and foodstuffs, leading to supply-chain disruptions which consequently choke off access to those goods in low- and middle-income countries.

During the emergency, many technological innovations have been pursued by NGOs, tech companies and humanitarian innovators to respond to these disproportionate effects. mHealth platforms and process innovations in crowdsourcing have helped maintain certain SRHR services to women, while innovative low-tech solutions in GBV programming have attempted to provide security to those at heightened risk of abuse. Educational programmes in refugee camps have been sustained through the creation of radio and other audio content, which adapt effectively to the social distancing measures required to contain the virus in these densely populated areas. Finally, innovations in advanced AI, unmanned aerial drones and satellite mapping have all been implemented to pinpoint areas that are most vulnerable to acute food insecurity, allowing authorities and humanitarian organisations to better target food aid.

The purpose of this report has been to provide a brief review of the current state of innovative Covid-19 solutions within a set of key thematic areas and to see how these experiences provide potential learnings for the future of innovation support under the broad umbrella of techvelopment. Many current innovations are proving helpful in supporting and reaching the most vulnerable around the world, but there is still a need to proceed with both caution and critical questions on the nature of the innovations being pursued. The state of exception brought about by the pandemic has fast-tracked the use of many new technologies in the development field, leaving us as of yet unaware of their wider societal implications.

We suggest five specific learning trajectories for the future of innovation support in development and humanitarian affairs:

- localise innovation and programming
- prioritise process over 'things'
- keep inequality concerns central and explicit in innovation support and programming
- always be aware of the human rights vulnerabilities of tech and innovation
- ensure that innovation continuously supplements, not replaces, existing work

Intuitively, humanitarian solutions are conceptualised in environments that are far removed from those in which they will be implemented – not least concerning technology – sometimes leading to ineffective or suboptimal responses. Rather, targeting solutions rooted in local knowledge, skills and technology will be more effective and more sustainable, as these solutions are far more likely to persist outside the context of the donor partnership and endure past the slated duration of a programme. Certainly, this depends on the scope of the project: global multilateral initiatives will take a broad approach to technology use. However, localised and community-focused projects must be based on the abundant resources and knowledge in those localities. By focusing on localised process innovations that speak first and foremost to the unique problems experienced by communities, these disproportionate impacts, borne out of long-entrenched inequalities, can be addressed more effectively. And when rebuilding systems broken by the pandemic,

organisations must continue to strengthen data protection and ethical guidelines in technological experimentation to ensure that these very same avenues of exploitation are blocked.

Strategic innovations that demonstrate a very clear view of who is in need, what those needs look like and why they are not being satisfied provide an optimum avenue for ensuring both relevance and impact.

Not all problems require advanced technological solutions. There is a serious discussion to be had surrounding the scope and scale of the problems we seek to alleviate with emerging methods and tools, not least because scale is not always a guarantee of lasting change. Covid-19 has taught us that the way we regard dilemmas of a political and social nature has been exceedingly singular and monolithic. There is, in fact, far more nuance – especially in a public health crisis of global proportions – than the currently predominant frameworks allow for. Low-tech or process innovations may in fact prove to be every bit as disruptive as advanced technologies, the boundaries and impacts of which we rarely understand fully. Covid-19's disproportionate effects call for revisiting questions concerning who is involved in innovation and when those innovations become truly relevant for their intended beneficiaries. The evidence of current crisis responses suggests that, by first detailing the nature of a problem, innovators can better highlight exactly which elements are the most problematic and to what degree they are problematic and use that information as a point of departure for devising an innovative solution.

There is an immunity to criticism associated with innovation that sometimes allows it to pass under the socio-political radar. In this immunity exists the risk that short-term solutions will take away the focus from other deeper innovations that address the root causes of issues like GBV or forced displacement. As already stated, innovation in its current iteration cannot completely usurp traditional forms of humanitarian response, which still require steadfast political clout and strong advocacy for rights-based governance. But that does not mean that innovation should be pursued in isolation from existing efforts or with lower expectations. The breadth and diversity of innovations are a core strength of this line of work, but that

does not release it from responsibility for strategic direction. On the contrary, strategic innovations that demonstrate a very clear view of who is in need, what those needs look like and why they are not being satisfied provide an optimum avenue for ensuring both relevance and impact. Internally, this requires organisations to rethink the strategic coherence of their innovation-portfolios whilst building competencies and systems for evidence generation and institutional learning. And in tangible programming efforts it demands in equal parts a focus on local innovation potential and the inclusion of beneficiaries in crucial problem identification and innovation design processes, but also a move to increasingly embrace process innovation and support to ecosystems rather than singular tech invention. If the innovation agenda is to deliver on its promises, it needs to gradually migrate from a set of radical, yet separate interventions removed from traditional programming to being more deeply integrated into transformative programmatic aims and objectives of fostering social, economic and political change.

NOTES

- 1 WHO (2020). Rolling updates on coronavirus disease (Covid-19). World Health Organization. Retrieved from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>. Accessed: 6 July 2020.
- 2 See: Drefahl, S., Wallace, M., Mussino, E., Aradhya, S., Kolk, M., Brandén, M., Malmberg, B., Andersson, G. (2020). Socio-demographic risk factors of Covid-19 deaths in Sweden: a nationwide register study. *Stockholm Research Reports in Demography*, 2020:23, 1-15. See also: Sobotka, T., Brzozowska, Z., Muttarak, R., Zeman, K., di Lego, V. (2020). Age, gender, and Covid-19 infections. *MedRxiv*. May 2020. 1-16.
- 3 During July-September of 2020 interviews were conducted with global and in-country staff from the WFP, UNDP, WB, UNHCR and UNICEF, as well as innovation labs.
- 4 Ford, L. (2020). US demands removal of sexual health reference in UN's Covid-19 response. *The Guardian*. Retrieved from: <https://www.theguardian.com/global-development/2020/may/20/us-demands-removal-of-sexual-health-reference-in-un-covid-19-response>. Accessed 28 July 2020.
- 5 See: Riley, T., Sully, E., Ahmed, Z., and Biddlecom, A. (2020). Estimates of the potential impact of the Covid-19 pandemic on sexual and reproductive health in low- and middle-income countries. *International Perspectives on Sexual and Reproductive Health*, 46, 73-76.
- 6 See: Bietsch, K., Williamson, J., and Reeves, M. (2020). Family planning during and after the West African Ebola crisis. *Studies in Family Planning*, 51(1), 71-86. See also: Camara, B.S. et al. (2017). Effect of the 2014/2015 Ebola outbreak on reproductive health services in a rural district of Guinea: an ecological study. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 111(1), 22-29.
- 7 Marie Stopes International (2020a). Stories from the frontline. Marie Stopes International. Retrieved from: <https://www.mariestopes.org/Covid-19/stories-from-the-frontline/>. Accessed 21 July 2020. See also: Danida (2018). Strategy for cooperation with Marie Stopes International (MSI) 2018 – 2021. Ministry of Foreign Affairs of Denmark. Retrieved from: <https://um.dk/en/danida-en/about-danida/danida-transparency/public-consultations/pc071118/>. Accessed 21 July 2020.
- 8 IPPF (2020). Covid-19 pandemic cuts access to sexual and reproductive healthcare for women around the world. International Planned Parenthood Federation. Retrieved from: <https://www.ippf.org/news/Covid-19-pandemic-cuts-access-sexual-and-reproductive-healthcare-women-around-world>. Accessed 21 July 2020. See also: Danida (2017b). The World 2030: Denmark's strategy for development cooperation and humanitarian action. Ministry of Foreign Affairs of Denmark. Retrieved from: <https://um.dk/en/~media/um/english-site/documents/danida/goals/strategy/the%20world%202030%20denmarks%20strategy%20for%20development%20cooperation%20and%20humanitarian%20action.pdf>. Accessed 27 July 2020.
- 9 Riley, T., Sully, E., Ahmed, Z., and Biddlecom, A. (2020). Estimates of the potential impact of the Covid-19 pandemic on sexual and reproductive health in low- and middle-income countries. *International Perspectives on Sexual and Reproductive Health*, 46, 73-76.
- 10 Purdy, C. (2020). Opinion: How will Covid-19 affect global access to contraceptives – and what can we do about it? *Devex*. Retrieved from: <https://www.devex.com/news/opinion-how-will-Covid-19-affect-global-access-to-contraceptives-and-what-can-we-do-about-it-96745>. Accessed 21 July 2020.
- 11 Goel, V. (2020). As Coronavirus disrupts factories, India curbs exports of key drugs. *The New York Times*. Retrieved from: <https://www.nytimes.com/2020/03/03/business/coronavirus-india-drugs.html>. Accessed 27 July 2020. See also: Lee, L. (2020). Condom shortage looms after coronavirus lockdown shuts world's largest producer. *Reuters*. Retrieved from: <https://uk.reuters.com/article/us-health-coronavirus-malaysia-karex/condom-shortage-loom-after-coronavirus-lockdown-shuts-worlds-top-producer-idUKKBN21E1OJ>. Accessed 27 July 2020.

- 12 Allen-Ebrahimian, B. (2020). China's domestic violence epidemic. *Axios*. Retrieved from: <https://www.axios.com/china-domestic-violence-coronavirus-quarantine-7b00c3ba-35bc-4d16-afdd-b76ecfb28882.html>. Accessed 27 July 2020. See also: Wanqing, Z. (2020). Domestic violence cases surge during Covid-19 epidemic. *Sixth Tone*. Retrieved from: <https://www.sixthtone.com/news/1005253/domestic-violence-cases-surge-during-Covid-19-epidemic>. Accessed 27 July 2020.
- 13 Grierson, J. (2020). Domestic abuse killings 'more than double' amid Covid-19 lockdown. *The Guardian*. Retrieved from: <https://www.theguardian.com/society/2020/apr/15/domestic-abuse-killings-more-than-double-amid-Covid-19-lockdown>. Accessed 27 July 2020.
- 14 UNFPA (2020a). Covid-19: Reporting on gender-based violence during public health crises. United Nations Population Fund. Retrieved from: https://www.unfpa.org/sites/default/files/resource-pdf/Reporting_on_GBV_During_Health_Crises_-_English_-_Final.pdf. Accessed 27 July 2020.
- 15 Grierson, J. (2020). Domestic abuse killings 'more than double' amid Covid-19 lockdown. *The Guardian*. Retrieved from: <https://www.theguardian.com/society/2020/apr/15/domestic-abuse-killings-more-than-double-amid-Covid-19-lockdown>. Accessed 27 July 2020.
- 16 UNFPA (2020b). Impact of the Covid-19 pandemic on family planning and ending gender-based violence, female genital mutilation and child marriage. UNFPA. Retrieved from: https://www.unfpa.org/sites/default/files/resource-pdf/Covid-19_impact_brief_for_UNFPA_24_April_2020_1.pdf. Accessed 28 July 2020.
- 17 Hodal, K. (2020). Why coronavirus has placed millions more girls at risk of FGM. *The Guardian*. Retrieved from: <https://www.theguardian.com/global-development/2020/jun/16/coronavirus-millions-more-girls-risk-fgm>. Accessed 28 July 2020.
- 18 Ibid.
- 19 ILO (2020). Women health workers: working relentlessly in hospitals and at home. International Labour Organization. Retrieved from: https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_741060/lang-en/index.htm. Accessed 30 July 2020.
- 20 Ibid., p.vii).
- 21 See CDC (2020). People with certain medical conditions. Centers for Disease Control and Prevention. Retrieved from: <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html>. Accessed 21 July 2020.
- 22 Marie Stopes International (2020b). Our response to the Covid-19 crisis. Marie Stopes International. Retrieved from: <https://www.mariestopes.org/Covid-19/>. Accessed 21 July 2020.
- 23 Ibid.
- 24 Waldman, L. and Stevens, M. (2015). Sexual and reproductive health and rights and mHealth in policy and practice in South Africa. *Reproductive Health Matters*, 23(45), p. 97.
- 25 Etheridge, B. and Spantig, L. (2020). The gender gap in mental well-being during the Covid-19 outbreak: evidence from the UK. *Institute for Social & Economic Research*, June 2020, 1-23.
- 26 Waldman, L. and Stevens, M. (2015). Sexual and reproductive health and rights and mHealth in policy and practice in South Africa. *Reproductive Health Matters*, 23(45), p. 98.
- 27 RIL (2020). Covid-19: A new type of humanitarian response. Response Innovation Lab. Retrieved from: <https://www.responseinnovationlab.com/Covid-19>. Accessed 29 July 2020.
- 28 See: Qureshi, H., Keyani, S., Babar, Q-u-A., Mumtaz, AA. (2011). Monitoring disease outbreak through geographical representation in rural areas. *Developments in E-systems Engineering (DeSE)*, 2011, IEEE.
- 29 Chunara, R., Chhaya, V., Bane, S., Mekaru, S.R., Chan, E.H., Freifeld, C.C., et al. (2012). Online reporting for malaria surveillance using micro-monetary incentives, in urban India 2010-2011. *Malar J*, 11:43. See also: Lwin, M.O., Vijaykumar, S., Fernando, O.N., Cheong, S.A., Rathnayake, V.S., Lim, G., et al. (2014). A 21st century approach to tackling dengue: crowdsourced surveillance, predictive mapping and tailored communication. *Acta Trop*, 130, 100-107.
- 30 See: UNFPA (2018). For girls escaping FGM in rural Tanzania, crowdsourced maps show the way to safety. United Nations Population Fund. Retrieved from: <https://www.unfpa.org/news/girls-escaping-fgm-rural-tanzania-crowdsourced-maps-show-way-safety>. Accessed 29 July 2020.
- 31 See: Bertrand, J.T., Kayembe, P., Dikamba, N., Mafuta, E., Hernandez, J., Hellen, J., and Binanga, A. (2014). Using mapping of service sites to increase contraceptive availability in Kinshasa, Democratic Republic of the Congo. *International Perspectives on Sexual and Reproductive Health*, 40(2), 95-99. See also: Rosero-Bixby, L. (2004). Spatial access to health care in Costa Rica and its equity: a GIS-based study. *Social Science and Medicine*, 58(7), 1271-1284.
- 32 PRB (2020). Contraceptive availability in Kawempe Division. Google My Maps. Retrieved from: https://www.google.com/maps/d/viewer?mid=1qy5Ul3wPKre_osuqpglCSlx0bFHExQt&ll=0.3737269802090179%2C32.55292627212942&z=14. Accessed 27 July 2020.
- 33 Wazny, K. (2018). Applications of crowdsourcing in health: an overview. *Journal of Global Health*, 8(1), 1-20.
- 34 See: Dzhanova, Y. (2020). NY domestic violence programs see client numbers decline as coronavirus traps survivors at home. *CNBC*. Retrieved from: <https://www.cnbc.com/2020/03/31/new-york-coronavirus-domestic-violence-programs-see-decline-as-disease-spreads.html>. Accessed 28 July 2020. See also: Southall, A. (2020). Why a Drop in Domestic Violence Reports May Not Be a Good Thing. *The New York Times*. Retrieved from: <https://www.nytimes.com/2020/04/17/nyregion/new-york-city-domestic-violence-coronavirus.html>. Accessed 28 July 2020.
- 35 Erskine, D. (2020). Not just hotlines and mobile phones: GBV service provision during Covid-19. UNICEF. Retrieved from: <https://www.unicef.org/media/68086/file/GBV%20Service%20Provision%20During%20Covid-19.pdf>. Accessed 28 July 2020, p.3.
- 36 Ibid., p. 4.
- 37 Juarez, S. (2020). Peru, Panama introduce gender-based rules for Covid-19. *Anadolu Agency*. Retrieved from: <https://www.aa.com.tr/en/americas/peru-panama-introduce-gender-based-rules-for-Covid-19/1790453>. Accessed 27 July 2020.
- 38 WTOP News (2020). Coronavirus Pandemic Pushes Countries to Bridge the Digital Divide. *WTOP News*. Retrieved from: <https://wtop.com/news/2020/07/coronavirus-pandemic-pushes-countries-to-bridge-the-digital-divide/>. Accessed 29 July 2020.
- 39 Humanitarian aid contributions. UNOCHA. Retrieved from: <https://fts.unocha.org/>. Accessed 25 September 2020.
- 40 UNHCR (2019). Stepping up: refugee education in crisis. UNHCR. Retrieved from: <https://www.unhcr.org/steppingup/wp-content/uploads/sites/76/2019/09/Education-Report-2019-Final-web-9.pdf>. Accessed 17 July 2020, p.4.
- 41 UNESCO (2020). Covid-19: What you need to know about refugees' education. UNESCO. Retrieved from: <https://en.unesco.org/news/covid-19-what-you-need-know-about-refugees-education>. Accessed 17 July 2020.
- 42 MMC (2020). Impact of Covid-19 on refugees and migrants: Covid-19 Global Update #5 – 30 June 2020. Mixed Migration Centre. Retrieved from: http://www.mixedmigration.org/wp-content/uploads/2020/06/118_Covid_Snapshot_Global_5.pdf. Accessed 15 July 2020.
- 43 WFP (2020). Covid-19 will double number of people facing food crises unless swift action is taken. *World Food Programme*. Retrieved from: <https://www.wfpusa.org/news-release/Covid-19-will-double-number-of-people-facing-food-crises-unless-swift-action-is-taken/>. Accessed 13 July 2020.
- 44 Ibid.
- 45 European Commission (2019). Global report on food crises – update September 2019. European Commission. Retrieved from: https://ec.europa.eu/knowledge4policy/publication/global-report-food-crises-2019-update-september-2019_en. Accessed 13 July 2020.
- 46 Obadofin, O.H. (2020). Impact of Covid-19 on nutrition and food shortages in Nigeria. *The Guardian Nigeria*. Retrieved from: <https://guardian.ng/features/the-impact-of-Covid-19-on-nutrition-and-food-shortages-in-nigeria/>. Accessed 14 July 2020.

- 47 De Sousa, A., Olurounbi, R. and Parija, P. (2020). Key food prices are surging after virus upends supply chains. Bloomberg. Retrieved from: <https://www.bloomberg.com/news/articles/2020-04-06/key-food-prices-are-surging-after-virus-upends-supply-chains>. Accessed 14 July 2020.
- 48 See Muhumuza, R. (2020). Locusts, Covid-19, flooding pose 'triple threat' in Africa. AP News. Retrieved from: <https://apnews.com/4d7f07d32115ce62f02c7c090b49f78e>. Accessed 14 July 2020. See also: Ren, G. (2020). Triple threat of floods, locusts, & Covid-19 plague Eastern Africa & Horn of Africa. Health Policy Watch. Retrieved from: <https://healthpolicy-watch.news/triple-threat-of-floods-locusts-covid-19-plague-eastern-africa-horn-of-africa/>. Accessed 15 July 2020. See also: Wood, V. (2020). East Africa facing 'triple threat' from coronavirus, locusts and flooding, Red Cross warns. The Independent. Retrieved from: <https://www.independent.co.uk/news/world/africa/coronavirus-latest-east-africa-flooding-locust-ethiopia-kenya-somalia-south-sudan-tanzania-rwanda-a9529321.html>. Accessed 15 July 2020.
- 49 Draper, J. (1980). The direction of desert locust migration. *Journal of Animal Ecology*, 49(3), 959-974. See also: Showler, A.T. (2013). The desert locust in Africa and Western Asia: complexities of war, politics, perilous terrain, and development. In E. B. Radcliffe, W. D. Hutchison and R. E. Cancelado (eds.), *Radcliffe's IPM World Textbook*. St. Paul, MN: University of Minnesota.
- 50 UN (2020). Policy brief: the impact of Covid-19 on food security and nutrition. United Nations. Retrieved from: https://namibia.un.org/sites/default/files/2020-06/sg_policy_brief_on_covid_impact_on_food_security.pdf. Accessed 13 July 2020, p.17.
- 51 See hungermap.wfp.org.
- 52 Ong, A.G. (2020). WFP launches HungerMap LIVE. World Food Programme Insights. Retrieved from: <https://insight.wfp.org/wfp-launches-hungermap-live-431e59553aa5>. Accessed 13 July 2020.
- 53 King, B. (2020). Covid-19: How the development community can contribute to food system resilience and recovery. CGIAR. Retrieved from: <https://bigdata.cgiar.org/blog-post/Covid-19-how-the-development-community-can-contribute-to-food-system-recovery-and-resilience/>. Accessed 14 July 2020.
- 54 FEWS NET (2020). Covid-19 pandemic impacts on food security. FEWS NET. Retrieved from: <https://fews.net/Covid-19-pandemic-impacts-food-security>. Accessed 14 July 2020.
- 55 News Desk (2020). Analysis-ready satellite data for all of Africa to support Covid-19 response and recovery. Geospatial World. Retrieved from: <https://www.geospatialworld.net/news/analysis-ready-satellite-data-for-all-of-africa-to-support-Covid-19-response-and-recovery/>. Accessed 15 July 2020.
- 56 Ruwaimana, M., Satyanarayana, B., Otero, V., Muslim, A.M., A, M.S., Ibrahim, S., Raymaekers, D., Koedam, N., and Dahdouh-Guebas, F. (2018). The advantages of using drones over space-borne imagery in the mapping of mangrove forests. *PLOS ONE*, 13(7), 1-22.
- 57 See: Armstrong, L. (2020). Huge locust swarms are threatening food security, but drones could help stop them. *The Conversation*. Retrieved from: <https://theconversation.com/huge-locust-swarms-are-threatening-food-security-but-drones-could-help-stop-them-140625>. Accessed 15 July 2020.
- 58 Le-Quesne-Papic, V. (2020). Mauritania tests drones for desert locust combat. BBC News. Retrieved from: <https://www.bbc.com/news/blogs-news-from-elsewhere-51065480>. Accessed 15 July 2020.
- 59 Sandvik, K.B. and Jumbert, M.G. (2018). *The good drone* (1st edn.). Abingdon, UK: Routledge.
- 60 BBC News. (2018). Chowberry app prevents food waste in Nigeria – BBC News. Retrieved from: https://www.youtube.com/watch?time_continue=63&v=4zUuS186_fw&feature=emb_title. Accessed 14 July 2020.
- 61 Sankara, T. (2017). It's time to fix the startup funding landscape in Kenya. Retrieved from: <https://nairobistartup.com/its-time-to-fix-the-startup-funding-landscape-in-kenya-68aba60a45d7>. Accessed 29 September 2020.
- 62 For other standards, see e.g. UN General Assembly Resolution 45/95 of 14 December 1990 adopting the Guidelines for the Regulation of Computerized Personal Data Files, which includes the humanitarian clause calling for particular care and flexibility when applying data protection principles in the humanitarian sector; the UN Principles on Personal Data Protection and Privacy, adopted by the UN High-Level Committee on Management (HLCM) at its 36th Session on 11 October 2018¹¹; the International Standards on the Protection of Personal Data and Privacy (the Madrid Resolution) adopted by the ICDPPC in Madrid in 2009; The OECD Privacy Framework (2013)¹³; the Council of Europe Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data (Convention 108), 14 including Protocol CETS No. 223 amending the Convention (now known as Convention 108+); the Resolution on Data Protection and Major Natural Disasters¹⁷ adopted by the ICDPPC in Mexico City in 2011; the Resolution on Privacy and International Humanitarian Action adopted by the ICDPPC in Amsterdam in 2015¹⁸; the ICRC Rules on Personal Data Protection (2015)¹⁹; the ICRC Professional Standards for Protection Work (2013)²⁰; the UNHCR Policy on the Protection of Personal Data of Persons of Concern to UNHCR. (2015)²¹; and the IOM Data Protection Manual (2010).
- 63 Kuner, C. & Marelli, M. (2020). *Handbook on data protection in humanitarian action*. Second edition. ICRC.

Photos

Cover illustration: Rasmus Fly Filbert

Page 4: Manoj Paateel / Shutterstock

Page 8: Javed Dar Xinhua / Xinhua/Ritzau Scanpix

Page 28: Kiselev Andrey Valerevich / Shutterstock

DIIS - Danish Institute for International Studies

The Danish Institute for International Studies is a leading public institute for independent research and analysis of international affairs. We conduct and communicate multidisciplinary research on globalisation, security, development and foreign policy. DIIS aims to use our research results to influence the agenda in research, policy and public debate, and we put great effort into informing policymakers and the public of our results and their possible applications.



DIIS · DANISH INSTITUTE FOR INTERNATIONAL STUDIES
Østbanegade 117 | DK-2100 Copenhagen | Denmark | www.diis.dk