Digital Opportunities for Displaced Women, Children and Adolescents
Overview

With an estimated 214 million people on the move internationally and forced displacement at a record high, population mobility is one of the leading policy issues of the 21st century.

Intractable issues such as wars, violence, political upheaval, religious persecution, economic instability and sociopolitical crisis uprooted record numbers of people during 2018; 2.9 million more people forced from their homes than in 2016 – the biggest increase the UNHCR has ever seen in a single year. A substantial portion of the total upsurge was represented by those under 18 years of age (51 per cent of the global refugee population) and women (between 47 and 49 per cent). Globally, the number of asylum applications from separated or unaccompanied children is now reaching record highs.

Common challenges for displaced women include access to healthcare, physical abuse, discrimination, sexual violence, and human trafficking (sex trade and illegal human organ trade). The lowest rates of preventable mortality and morbidity among women, adolescents, and children occur in humanitarian and other crises. Common challenges for displaced women include access to healthcare, physical abuse, discrimination, sexual violence, and human trafficking (sex trade and illegal human organ trade). They can also suffer demoralization, and mental health distress.
The UNHCR’s Protection Risks for Women and Girls in the European Refugee and Migrant Crisis report concluded that migrant women and girls face grave risks and that the current response by governments, humanitarian actors, EU institutions, and agencies is inadequate. This knowledge brief introduces the variety of digital tools that can be used to support and protect the health of women and children on the move.

International humanitarian assistance remains a critical resource to meet the needs of people affected by crisis and agencies are under increasing pressure to make the best use of resources and account for aid dollars with the largest funding short-fall of US$10.3 billion (41% of requirements) in 2017 recorded to date.
Why is digital capability important in humanitarian settings?

Digital technologies can add value to women and children on the move in multiple ways. Women and children with no identity can be missed by national social programs in addition to the risks posed by being on the move. Developments in digital technologies enable the tracking and delivery of in-kind aid and facilitate cash assistance programs in humanitarian settings and coordinate, collect and analyse data in crisis to enable a timely and appropriate response. The section below is drawn from a systematic literature review by Mesmar et al (2016)\(^6\), which summarises how digital tools can support women and children on the move.
**Technology uses in humanitarian settings**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td><strong>DIGITAL CLASSROOMS AND DIGITAL STORY TELLING</strong></td>
<td>A tool kit with built-in 3G network, loaded with e-books, HD hand-held cameras, graphic design and video software, documentaries, movies, arts and crafts materials, projector, games, and one built-in stage for musical and theatrical representations.</td>
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<tr>
<td><strong>DIGITAL COMMUNICATIONS</strong></td>
<td>Communication between agencies and decision making.</td>
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<tr>
<td><strong>ELECTRONIC HEALTH RECORDS</strong></td>
<td>An electronic version of a patient’s medical history and records, maintained by the health care provider over time, and may include administrative and clinical data relevant to the persons’ care.</td>
</tr>
<tr>
<td><strong>ELECTRONIC VOUCHER CASH CARDS</strong></td>
<td>Mobile network operators work with humanitarian organizations to provide financial mobile money services where vouchers are given and can be topped up at recharge machines using landline connection.</td>
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<tr>
<td><strong>GAMING</strong></td>
<td>The use of digital games that take place in both reality and virtual reality.</td>
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<tr>
<td><strong>GEOGRAPHICAL INFORMATION SYSTEM (GIS)</strong></td>
<td>A system that allows for the portrayal of multiple layers of data on interactive maps.</td>
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<tr>
<td><strong>HAND HELD ELECTRONIC DATA ENTRY</strong></td>
<td>Input biographical data to identify those in need.</td>
</tr>
<tr>
<td><strong>LOW COST COMPUTERS</strong></td>
<td>Credit card sized computer that can be inserted in monitors or small motherboards preloaded with educational material and act as information portals to access education in areas with intermittent internet access.</td>
</tr>
<tr>
<td><strong>PORTABLE MEDICAL EQUIPMENT</strong></td>
<td>Medical devices that have been redesigned to be compact and portable.</td>
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<tr>
<td><strong>ROBOTICS</strong></td>
<td>The use of programmable machines.</td>
</tr>
<tr>
<td><strong>SOCIAL MEDIA</strong></td>
<td>Websites and applications that allow content sharing to create a network of shared users.</td>
</tr>
<tr>
<td><strong>SMS</strong></td>
<td>Text messaging service information is given on early warning alerts and local assistance numbers.</td>
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</tbody>
</table>
**SPATIAL DECISION SUPPORT**
Interactive system that assists decision making while taking into account spatial dimensions.

**SPOKEN LANGUAGE TRANSLATION**
Translates spoken language to healthcare providers.

**SURVEILLANCE SYSTEMS**
The collection, analysis and interpretation of health data to guide interventions in real time.

**3D PRINTING**
Low-cost digitally fabricated prosthetics and fabrication laboratories equipped with laser cutters, vinyl cutters, milling machines, 3D printers, and scanners.

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### Table 2

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<thead>
<tr>
<th>TECHNOLOGY</th>
<th>EXAMPLE OF ITS APPLICATION</th>
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<tbody>
<tr>
<td><strong>HUMANITARIAN CRISIS PREPAREDNESS</strong></td>
<td>Geographical information systems (GIS) have been a major game changer. GIS now underpins risk assessments, vulnerability models, and spatial decision support systems (SDSS) that predict outbreak and spread of diseases. Examples include disease surveillance systems that assess disease risk during natural disasters, and emergency preparedness of households with specific health needs. These systems have been found to enable continuity of care throughout a disaster.</td>
</tr>
<tr>
<td><strong>HUMANITARIAN CRISIS PREPAREDNESS AND RESPONSE</strong></td>
<td>Social media and geolocation technologies inform decision-making and are used by humanitarian personnel to compile and analyze location data to create evacuation and emergency response models. Surveillance systems based on social media have been used to assess emerging disease risk. This also allows a temporal analysis of such data and, when combined with GIS and SDSS, can enable the prediction of disease outbreaks and their mortality quite accurately. This aids risk assessment that can improve communication between agencies and support decision-making. Use of cloud-based electronic health records can successfully recover health records in case of disasters and damage to physically held records and local databases.</td>
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<tr>
<td>HUMANITARIAN CRISIS RESPONSE</td>
<td>Data entry using mobile devices now commonly facilitates the registration of displaced individuals, to conduct surveys, identify those in need of assistance, and to capture data on issues such as food security, vaccination rates, and mortality. Accurate and timely data entry supported efficient data monitoring and provenance while maintaining data security. Geographic information systems (GIS) are used to portray areas of conflict through the creation of live crisis maps that document the intensity of conflict and identify the number of people in need of assistance. They are used for demand-based responsive supply for displaced populations and to create warnings. GIS can also be used to track population movements, to identify those in high-risk zones in cases of disease outbreaks, and to send text messages containing health information that can be sent to those proximal to an outbreak area. Technologies that combine GIS and social media have made it possible for humanitarian organizations to aggregate posts and broadcast information to public officials or to rescue and relief organizations. When humanitarian response is initiated, GIS can evaluate the security, road safety, and effectiveness of vehicles, to inform logistics, coordination, and evacuation. In addition, unmanned aerial vehicles have been used to deliver humanitarian aid in hard to access areas and to map survivors. Digital technologies such as the internet, SMS, and social media are also used to deliver training for healthcare providers during crises. Portable medical devices enable physicians to run tests including eye examinations, tests for tuberculosis, and the identification of biomarkers for HIV positive patients.</td>
</tr>
<tr>
<td>PREPAREDNESS, RESPONSE, RECOVERY</td>
<td>Surveillance systems enable information gathering about displaced populations or evacuees. Data aggregation and analysis are used to detect communicable diseases, and to support follow-up on damage, loss, mental health diagnoses, and chronic conditions. Cloud-based electronic health records aid the monitoring and evaluation of health status of registered refugees over the longer term, potentially improving continuity of care, especially in protracted crises. Technologies intended to overcome language and cultural barriers include websites and spoken language translators to increase communication and familiarize healthcare providers with cultural beliefs of refugee populations. Affordable training and education applications can cover all stages of humanitarian programming.</td>
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</table>
### Technology used by populations affected by humanitarian crises

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<tr>
<td><strong>DIGITAL CLASSROOMS AND DIGITAL STORY TELLING</strong></td>
<td>Improving sense of security, inclusion for those who are illiterate. Improved information security and risk prevention from rumors and misinformation. Support for post-traumatic stress disorder. Strengthening peace and reducing community tensions.</td>
</tr>
<tr>
<td><strong>ELECTRONIC VOUCHER PROGRAMS</strong></td>
<td>Refugees have the liberty of utilizing cash resources for needs such as shelter, food, health (access to antenatal care), pharmaceuticals, water, sanitation, hygiene products, and cash transfers.</td>
</tr>
<tr>
<td><strong>LOW COST COMPUTERS</strong></td>
<td>Computer is preloaded with health content and libraries of health videos to improve health literacy. Provides refugees with solutions for provision of healthcare, protection from violence and abuse, and education on human rights. Aims to teach basic computing skills.</td>
</tr>
<tr>
<td><strong>SMS</strong></td>
<td>Enquiries received are forwarded and shared with community members and used to create interactive live radio and television programs with the aim of improving coordination and risk communication during natural disasters to save lives and property.</td>
</tr>
<tr>
<td><strong>SOCIAL MEDIA</strong></td>
<td>The accounts are information hubs for camp residents such as schedules for distribution of aid, available job opportunities, and access to services, weather forecast warnings and preparedness, with the aim of improving communication, advocacy, and health promotion.</td>
</tr>
<tr>
<td><strong>3D PRINTING</strong></td>
<td>Refugees who have suffered injuries in wars are trained to use 3D printing labs to learn how to print prosthetic body parts. Empowers refugees to be involved in the process of creating solutions to the problems they deem to be important.</td>
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</tbody>
</table>
What works: initiatives and stakeholders

Mobile connectivity

The UNHCR (2016) has been working with global partners to improve the level of mobile connectivity for refugees. Three-quarters of the total refugee population lives in Sub-Saharan Africa (29 per cent), the Middle East and North Africa (29 per cent) and South Asia (18 per cent), areas that have lower-than-average 3G coverage. Compared to the world as a whole, refugee households are approximately 50 per cent less likely to have an internet-enabled phone and approximately two and a half times more likely to be living without a phone. This is driven by refugees’ extreme difficulties in affording a device or data plan, a problem caused by factors such as the very fact of their displacement or by government restrictions on their right to work or move freely from place to place.

During the European refugee crisis, thousands of refugees used their mobile phones to navigate their way across the continent using their cellphones in 2015. Many refugees rely on cellphones as an absolute necessity (the connected migrant), sometimes prioritizing phones over food or shelter. Without mobile phones and internet access, refugees cannot locate themselves or their loved ones geographically. Moreover, they cannot find help (UNHCR, 2016).

Some humanitarian groups are beginning to develop services that make use of mobile and internet technologies. Connecting refugees to digital tools will have a transformative impact on the humanitarian sector. For example, NGOs in Tanzania said there were huge safeguarding opportunities through enhanced connectivity (e.g. help lines or mass messaging to inform refugees about major issues, such as a cholera outbreak).

There are new solutions being developed to reach refugees, such as UNHCR’s Ascend, which has been piloted in Costa Rica. This uses Frontline Cloud (an online SMS management platform) and allows...
organizations to send out mass messages to refugees. To get the best out of this sort of technology, such initiatives would have to be expanded and coordinated comprehensively (UNHCR, 2016). The inherent security risks of connecting political refugees to the internet would need to be managed through strict data security protocols.

UNHCR (2016) found there were 879,853 migrants living without any mobile coverage. By working with partners to introduce wi-fi connectivity, boost internet coverage and provide mobile connectivity, there are vast benefits to health, livelihoods, education and community-based protections. Residents of the Nyarugusu Refugee Camp, Tanzania, for example, found improved well-being, access to cash transfers, can access health alerts via SMS, experienced increased self-reliance and safety. The digital solution was not complex nor expensive – it required an on-the-ground understanding of how technology was being used and how it could be better implemented through multi-stakeholder engagement to benefit the lives of forced migrants.

Digital technologies can add value to women and children on the move in multiple ways. Women and children with no identity can be missed by national social programs in addition to the risks posed by being on the move.

Crisis mapping and remote monitoring:

Satellite imagery, social media, and radiofrequency identification do not require strong ground presence for data collection. They can provide near real-time updates on changing conditions; social media posts are often geocoded, which provides valuable localizing detail as well. Crisis mappers layer social media generated data with satellite imagery when available to evaluate road conditions in crisis areas, providing up-to-the-minute maps for aid organizations. Drones can map displaced populations and provide real-time visuals on infrastructure damage and can collect data to improve planning and project implementation.
Supply chain

Logistics efforts account for 80 per cent of disaster relief. Supply chain visibility and data tracing can often be poor. Increasing supply chain transparency can “greatly improve humanitarian operations by providing data to inform more effective and accurate decisions, enabling evidence-based interventions and management, exposing issues for effective remedy and increasing accountability.”

Blockchain technology offers a way to introduce transparency in humanitarian supply chains. By providing a publicly visible ledger, the blockchain can be used as a data platform that traces the origins, use and destination of humanitarian supplies. As a shared, secure record of exchange, blockchains can “track what went into a product and who handled it along the way, breaking supply chain data out of silos, and revealing the provenance of a product to everyone involved from originator to end user.”
Digital identity

When people are forced from their homes, or they choose to leave for reasons of personal and familial safety, rarely is there the chance to secure proof of identity or this is lost, stolen or requisitioned during the process of migration. Research by the Norwegian Refugee Council (NRC) found that 70 percent of Syrian refugees lack basic identification documents. Without identity, displaced persons and refugees risk falling through the cracks, becoming vulnerable to trafficking or stateless. According to the World Bank (2018) there are now over a billion people without a recognised identification.

Blockchain technology has been used in proof-of-concepts in Syria, Jordan and Pakistan in the WFP’s Building Blocks programme, the IFRC’s 2018 digital identity and cash transfer programme in Kenya, the UN’s ID2020 alliance – a collaboration between industry and humanitarian
agencies, towards a portable, private and permanent digital identity - and UN Women’s Global Flagship Programme for Disaster Risk Reduction (Gender Inequality of Risk) and Crisis Response and Recovery (LEAP-Women’s Leadership, Empowerment, Access and Protection). In the WFP’s Building Blocks programme, an identity was entered into a database and verified using biometric iris scans. The identity was hosted and owned by the data manager. This enabled the data owner to manage risks associated with compliance, privacy and liability by keeping the data in-house.

Sovrin is a permissioned blockchain that works with iRespond to support self-sovereign identity using biometric identification to generate a private key and authenticate individuals using iris scans. The UN’s ID2020 alliance is using iRespond in a pilot-project in the Mae La Refugee camp in Thailand, where 40,000 people live. iRespond’s digital identities will provide the camp residents with medical records and enable access to health care, using a Hyperledger Indy blockchain. iRespond have identified and registered communities in Kenya, Senegal, Sierra Leone and Myanmar for HIV testing and treatment securely and anonymously linking medical records automatically, with no ID cards or personal identifiers necessary, improving the tracking and treatment of HIV positive populations. What is promising about this project is that self-sovereign identity provision on the Hyperledger blockchain, for health care projects, provides a GDPR and KYC compliant, interoperable infrastructure for cross-industry projects that supports a range of modules, like smart contract engines and different consensus protocols. This makes it a versatile solution for the complex health care environment.

Further, a 2018 project by the Norwegian Red Cross, tested Blockstack, Sovrin and uPort to provision self-sovereign identity, extracting ten design decisions using privacy-by-design and humanitarian information management principles intended to bring organisations together to talk about a shared and interoperable system for the humanitarian sector.

### Human trafficking

Blockchain can help reduce human trafficking by giving paperless identification documents to children based on biometric data, such as fingerprints or facial scans, which would be impossible to fake. The country of Moldova allegedly has the highest rate of human trafficking in the world due to widespread unemployment and poverty that drives many people to look for work internationally. Every year, hundreds of women and girls are trafficked from Moldova to Russia, Turkey, the United Arab Emirates and other nations, mainly to work as sex slaves. Consequently, Moldova was been put on the United States’ watch list of countries that are not doing enough to fight human trafficking. Now, Moldova, is working with Consensys and the UN to stamp out human
trafficking. Children attempting to cross the border would have their iris scanned which would alert their guardians, two of whom would have to approve their leaving the country. This approval is recorded on the blockchain, which cannot be removed by bribing officials, reducing instances of corruption as well as trafficking. This approach can apply to other humanitarian settings.

Furthermore, blockchain technology can be used for crowdfunding and microfinancing in emergencies by using existing digital currencies and by providing a decentralized funding platform. OCHA’s Crowdfunding for Emergencies Think Brief reports that “increasing transparency, accountability and reporting among donors, project initiators and funding recipients increases trust in the project and ensures continued donor engagement.”

The Blockchain and Distributed Ledger Technologies in the Humanitarian Sector report found that while transparency and trust are often cited as the most significant benefits of distributed ledger technologies (DLTs) like blockchains, at the system level the improved efficiency, bureaucracy and project cost savings brought about by DLTs have proved to be more important for humanitarian actors.

**Financial flows**

International humanitarian assistance remains a critical resource to meet the needs of people affected by crisis and agencies are under increasing pressure to make the best use of resources and account for aid dollars with the largest funding short-fall of US$10.3 billion (41% of requirements) in 2017 recorded to date. A drive for transparency and accountability has, therefore, become all the more important further to the reports that a lack of project information and reporting has permitted the under-delivering of hundreds of millions of funds.

Calls for ‘greater transparency of the financing flows to humanitarian crises’ and the publishing of “timely, transparent, harmonised and open high-quality data” have contributed to the primary motivations for humanitarian agencies introducing blockchains into the humanitarian environment being related to increasing transparency, accountability and efficiency over improving aid delivery.

In the ‘Building Blocks’ program, the WFP found using blockchains reduced their transaction fees by 98%.
Humanitarian actors increasingly use digital tools for borderless problem-resolution and, as part of a suite of Web 4.0 technologies. Blockchains, particularly, can be successful in delivering effective medical support to vulnerable, moving populations.
Innovations in mobile technology have brought about a shift in the way humanitarian organisations deliver aid to refugees. In 2004 it was estimated cash transfers only represented 1% of humanitarian aid. This figure rose to 6% by the end of 2015 and to 40% by the end of 2017.\textsuperscript{29, 30} Cash transfers are increasingly used as a modality for delivering aid, and cash-based interventions dispensed via mobile money platforms have been found to deliver various benefits to the humanitarian sector. Cash transfer and mobile money programmes on 2G and 3G networks, particularly, are successful for using known and trusted methods of engagement and exchange. Cash transfer programmes are popular because they are easy to implement, they are protective and modify the intermediate determinants of health; nutrition, child deprivation, sexual risk behaviours and teen pregnancy.\textsuperscript{31}

They can also address the structural determinants of health, such as financial poverty, education, child labour, social capital and cohesion\textsuperscript{32} and have secondary benefits of awarding programme beneficiaries a sense of dignity and autonomy over in-kind aid transfers.\textsuperscript{33}

**Education, social support networks, and healthy child development**

Low-cost computers and digital classrooms have increased access to education (including health education) for affected populations in low resource settings. Information portals with preloaded content enhance access to information that addresses human rights, protection from violence and abuse, and computing skills. Technologies such as digital storytelling provide children with a sense of social inclusion and community interaction to promote mental health, well-being, and healthy child development.

PMNCH is well-placed to provide a critical function in gathering traction in digital tools for women’s and children’s health in humanitarian settings in line with the Partnership’s functions.
What is missing? Opportunities

**BIAS**
Technologies can make data collection faster and easier, but they can also introduce bias. If cellphone ownership is concentrated in certain areas or among certain demographics, SMS-based surveys will disproportionately capture those groups and may not be appropriately representative of populations in need.

**LACK OF EVALUATION AND NEED FOR NEW EVALUATION METHODS**
Very few evaluations exist of uses of digital technologies in humanitarian contexts. Evaluation should be integrated into design and deployment.

**CAPACITY OF EXISTING INFRASTRUCTURE**
Some technologies require stable electricity, mobile, or wireless networks.

**LIMITED USER PARTICIPATION IN DESIGN**
Even when technologies are intended to be used by affected populations involvement is often superficial. There is a need to include users to increase relevance and sustainability.

**COST**
Cost of technology can vary widely.
Issues of privacy and security need attention. People caught in humanitarian crises fear having their personal information leaked or their location identified, and fears of being tracked. Care should be taken to ensure that all data is de-identified and no personal information is collected without consent.34

Some countries have regulations restricting the use of certain technologies.

Research on online peer-to-peer financing and the potential for scaling up finance models that cut out the traditional ‘middleman’, and instead go directly to communities in need to reduce the usual transaction costs associated with international humanitarian financing.35

Some technologies are still at an early stage and have not been proven at scale.
Way forward

PMNCH is well-placed to provide a critical function in gathering traction in digital tools for women’s and children’s health in humanitarian settings in line with the Partnership’s functions.

- Humanitarian work can be hampered by limited information sharing and double-handling. Addressing the complex issue of women on the move requires multi-stakeholder collaboration to break down data silos and harmonise the process of collaboration.

- By gathering knowledge products in Frontier Technologies, RMNCAH are building knowledge and understanding of digital applications for women and children on the move for the means to more effectively track promises and progress towards Global Strategy goals.

- Humanitarian actors are often leaders in using new technologies to effect social impact. PMNCH can use their advocacy role to use digital tools more effectively work with Partners on a common set of goals and common measures of success, accelerate innovation and amplify partners’ voices.

- To commission a study of digital technologies for the health and well-being of women, children and adolescents on the move.

How can PMNCH help?

PMNCH can support independent research and consultation with a mission to ensure digital capabilities work for women, children and adolescents. It can define and inform good practice in the design and deployment of digital tools, by building evidence and foster rigorous research and debate, and convening diverse voices to create a shared understanding of the ethical and practical issues.

What is needed is a concerted and collaborative effort to engage multiple senior stakeholders working in complex policy environments. There is evidence of a growing body of work by humanitarian actors intent on
using digital tools for borderless problem-resolution and, as part of a suite of Web 4.0 technologies, there are use cases that demonstrate that blockchains, particularly, can be successful in delivering effective medical support to vulnerable, moving populations.

The functions that PMNCH serve in their strategic objectives to: deepen partnerships, promote in-country engagement, drive accountability and results-oriented action are all ways to help promote the collaborative, integrative use of technologies in supporting women’s and children’s health on the move. The solutions involve a collaborative effort between disparate humanitarian actors towards knowledge-sharing. PMNCH is well placed for this advocacy role.
References


7. Mesmar, S. et al. (ibid)

8. Mesmar, S. et al. (ibid)

9. Mesmar, S. et al. (ibid).


22. https://www.uport.me/


Digital opportunities for displaced women, children and adolescents

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