DISPLACED CHILDREN AND EMERGING TECHNOLOGIES:

SAVE THE CHILDREN'S OPPORTUNITIES FOR INVESTMENT AND IMPACT

Save the Children

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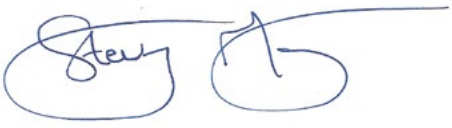
Every year, more and more children are displaced by conflict and violence. By the end of 2017, this figure reached approximately 36 million; 53% of the global forced displaced population of 68.5 million, and almost twice the number we witnessed in 2005. There is no sign that this upward trend will stop anytime soon.

This crisis in child displacement is occurring amidst a context of rapid technological change – change that is revolutionising the aid sector. Our common challenge is identifying how to harness this transformative shift in the most effective and ethical way. Technology isn't intrinsically good or bad – it's about how we choose to use it.

Consequently, Save the Children's Migration and Displacement Initiative (MDI) commissioned the 'Displaced Children and Emerging Technologies' report, to increase our understanding of the opportunities and potential pitfalls engendered by technological change in the displacement context. The report findings identify numerous potentially transformational and cost-effective technologies that could massively improve our ability to access and assist vulnerable displaced populations – particularly children.

The findings also provide a greater understanding of the programming challenges, child safeguarding risks and ethical dilemmas provoked by these new and often fast-changing technologies. It outlines some of the important steps Save the Children has already made to respond to these developments, but makes clear that there is a lot more we need to do. And whilst the primary focus of the report is Save the Children itself, it is apparent that many of the findings – and the recommendations – apply widely across the aid sector.

Reading the report brings to mind the old story of King Canute, who is famed, albeit erroneously, for sitting on the beach on his throne, and commanding the tide to stop. Unsurprisingly, he wasn't successful. It's clear that technological change is equally irreversible and that as a sector, rather than resisting, we must increase our understanding, oversight and usage of these changes to ensure that they are used for the common good. This report is one small step towards doing this – and I feel confident that its findings and recommendations will prove both relevant and useful for colleagues and partners alike.



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CONTENTS

ACRONYMS AND ABBREVIATIONS

BIMS	Biometric Identity Management Systems
BPDA	Big Data and Predictive Analytics
DLT	Distributed Ledger Technologies
EdTech	Educational Technology
GAHI	Global Alliance for Humanitarian Innovation
GIS	Global Information Systems
HIA	Humanitarian Information Activity
HIF	Humanitarian Innovation Fund
IA	Information Activity
ICT	Information and Communications Technology
ICT4D	Information and Communication Technology for Development
IDIA	International Development Innovation Alliance
IDP	Internally Displaced Person
IMS	Information Management System
IOM	International Organization for Migration
M&D	Migration and Displacement
MDI	Migration and Displacement Initiative
RIL	Response Innovation Lab
RIMS	Regional Information Management System
SCI	Save the Children International
UNICEF	United Nations Children's Fund
WFP	World Food Programme

EXECUTIVE SUMMARY

RATIONALE AND CONTEXT

The unprecedented rise in child displacement worldwide – currently 36 million, or 53%, of the global population of 68.5 million forcibly displaced – and programmatic responses of displacement-mandated organizations such as Save the Children, is occurring across a rapidly changing technological landscape (UNHCR 2017; 2018).

Increased digital connectivity of displaced populations through mobile devices, the growing reliance on data technologies in aid programming aimed at large, mobility-affected populations, and emerging, potentially disruptive new technologies, are all enabling better means for reaching and assisting these often vulnerable, hard-to-reach populations. At the same time, the rapid introduction of technological innovations pose new ethical dilemmas, and potential threats to the safety and wellbeing of the displaced child that are not sufficiently addressed by existing practice.

Save the Children and other displacement-mandated organizations must recognize that such technologies are here to stay, and will fundamentally change the displacement and migration landscape. There are opportunities and risks to leveraging and investing in each new technological innovation, which Save the Children and other agencies must carefully navigate in order to continue delivering effective responses to child displacement.

REPORT SCOPE AND FOCUS

The following report was commissioned by Save the Children International's Migration and Displacement Initiative (MDI) to identify key opportunities – and risks – for adopting near-future technological innovations in child displacement programming. It provides an accessible, top-line framing of priority considerations related to technological innovations that target displaced children and their families, in order to inform programming, policy and research decision-making.

Mapping the wider innovation ecosystem through a child displacement lens, the study first highlights key technological domains for priority investments, providing illustrative case examples of recent Save the Children innovations. A framework for selecting safe, ethical and appropriate technologies within each domain is also presented.

The study then identifies and analyses opportunities and barriers for improving innovation management capacity in migration-mandated organizations, to better leverage relevant technologies and processes to improve child displacement programming and mitigate digital safeguarding risks.

FINDINGS

1. The study identifies, within a wider aid innovation ecosystem, **five technological domains particularly relevant to child displacement programming innovation:**

- **Registration and case management:** including the use of biometrics to manage the identity of displaced individuals and populations, as well as different software platforms for family tracing and reunification;
- **Digital connectivity:** leveraging growing mobile phone and internet usage worldwide to improve reach and delivery of services to displaced populations, and to better support Save the Children staff in programmatic implementation;
- **Educational technology (EdTech):** software and hardware designed specifically for use by children, teachers, parents or facilitators to provide education to hard-to-reach populations, including those that are displaced or on the move;
- **Predictive analytics:** particularly models drawing from big data for early warning/strategic planning around child displacement; and
- **Remote sensing:** the use of geographic information systems (GIS), using data from satellites and aircraft, including drones, to monitor mobile populations.

Mai* lives with her parents and three sisters in a displacement camp in north-east Syria. Mai and her family used to live in Aleppo and had a happy life. The family moved to a village in Raqqa where ISIS later took control of the area.

*Name changed to protect identity

2. The study also finds **good practice lessons emerging from several "spotlight" initiatives and pilots** where Save the Children is adopting and mainstreaming extant technological innovations into its workflows and procedures around child displacement. Illustrative case studies discussed in the full report include the Primero/CPIMS+ case management system, the "Every Child Learning" edtech initiative focusing on increased educational opportunities for Syrian refugees in Jordan, and MDI's Predictive Analytics for Displacement project. These examples, among others, illustrate the organization's progress in piloting and scaling new technologies in displacement contexts; successfully adapting existing external technologies to Save the Children's case-management work-flows; and introducing new data science advancements for improved protracted displacement planning.

3. Led by the dedicated efforts of a core group of staff across the movement, Save the Children is moving towards a more strategic approach in prioritizing and investing in technological innovation. This is resulting in improved coordination of learning and technical support around innovation, facilitated by new mechanisms such as the Humanitarian Innovation Platform, a movement-wide network of "innovation champions", and the implementation of multiple technological innovation pilot initiatives across members. **At the same time, however, there are a number of key capacity constraints stemming from a fragmented innovation management[1] approach across the movement.** These include:

- **A need to build a more empowered and resourced centralized innovation coordination capacity** across the organization's federated structure, including dedicated support for relevant technological innovation processes specifically relevant to child displacement programming.
- **Insufficient technical capacity in key technological skillsets** (i.e. data science, informatics), and need to **better leverage both existing organizational** capacities (at member, regional, and country level) and **build/deepen partnerships** with relevant external stakeholders.
- Need for **more dedicated, long-term innovation management staff positions.**

Khalid*, 7, at Save the Children's Child Friendly Space in a displacement camp, north-east Syria.

4. Digital technologies **pose a range of ethical risks (including traditional risks exacerbated by the use of Information Communication Technologies [ICTs]) often insufficiently addressed by traditional safeguarding approaches.** These include, for example, the displaced child's right to:

- access and communicate relevant information during a crisis;
- be protected from potential threats and harm resulting directly or indirectly from the use of data;
- expect privacy and security of their personal information;
- maintain their data agency, i.e. their right to agency over the collection, use and disclosure of personally identifiable information;
- receive rectification and redress of inaccurate or incomplete personal data.

Critically, within this broader ethical context, traditional **child safeguarding policies and procedures in place cannot be assumed to sufficiently address and prevent the specific risks, threats and harms that may come from digital tech currently, or in the future.**

1 "Innovation Management" refers to the broad set of project management skills for successfully identifying, adjusting, diffusing and scaling novel approaches for improved child displacement programming.

*Name changed to protect identity

Save the Children is currently reviewing its safeguarding approaches in response to these emerging challenges, although interviews with staff found more work needs to be done in aligning awareness of these efforts across the movement. In this regard, Save the Children is part of a wider sectoral debate about safeguarding concerns and broader ethical implications of new technologies, for which clear good practice related to child migration and displacement issues is still emerging.

5. Save the Children is unique amongst other migration and displacement-mandated aid organizations in that **its members currently host or are closely affiliated with several leading innovation-related humanitarian consortia** – including Save the Children UK's relationship with the Global Alliance on Humanitarian Innovation (GAHI), Elrha's Humanitarian Innovation Fund (HIF), and the Start Network, and the wider organization's role as a founding member of the Response Innovation Labs (RIL). However, across the movement, Save the Children staff often appear unaware of the existence and/or added value of these actors, and more can be done to better leverage their support earlier in child displacement-relevant innovation processes.

Sara* is 14 years old and lives at the displacement camp in Syria with her parents, four brothers and younger sister. Sara attends our Child Friendly Space, where she feels less afraid and alone.

RECOMMENDATIONS

1. The study recommends five key, interlinked areas of innovation investment to enhance Save the Children's overall programmatic capabilities related to child displacement, broadly aligned to the five technological domains identified above:

Registration and case management: Support the responsible adaptation of ICTs for cross-border case management, including technologies for child registration;

Digital connectivity: Develop assessment tools for measuring connectivity of displaced children and their families, to inform the design of interventions aimed at leveraging this connectivity to deliver services;

EdTech: Convene and improve collaboration partners around further refinement and deployment of EdTech solutions tailored to child displacement contexts (including those with linkages to mental health and psychosocial [MHPSS] programming);

Predictive analytics: Deploy decision-specific predictive analytics and other cutting-edge informatics approaches, with a specific focus on supporting migration and displacement programmes;

Remote sensing: Given the high start-up costs in terms of hardware, information management architecture, and staff technical capacity-building, Save the Children should instead invest in partnerships with agencies, such as UN organizations, academic research centers, and the private sector, which already have pre-existing capacity and competency in remote sensing.

As outlined further in the following report, each area of proposed investment will require specific dedicated technical capacities, new types of human resources, enhanced innovation management capabilities, and intervention-specific ethical and regulatory review and oversight.

*Name changed to protect identity

2. Each priority area also affords opportunities for different partnership models through which child migration-mandated organizations like Save the Children can leverage support from innovation partners in humanitarian and development organizations, civil society, and the private sector. Existing and emerging tech-sector relationships across the movement provide strong starting points, but this study calls for Save the Children to take a convening role in building multi-stakeholder innovation partnership platforms, building on its established leadership in the child displacement space.

3. Save the Children must ensure that its child safeguarding guidance keeps pace with new technologies it adopts for work in child displacement programming. This commitment requires not only regular updating of established guidance as new innovations in digital technology emerge, but also a concurrent effort to ensure that new guidance is systematically applied throughout the organization. Building on its existing expertise in child safeguarding policies and procedures, **Save the Children should also lead in parallel on the establishment of sector-wide child safeguarding best practices specific to digital risks and harms relevant to children affected by migration and displacement.**

4. Within the area of child displacement, Save the Children currently appears strongest at adopting and integrating existing and emerging technologies into established programmatic areas of competency. In this context, **it should ensure that existing and *emerging* innovations are sufficiently linked to specific programmatic tasks and purposes, such as case registration and predictive displacement, while focusing more effort and resources on bringing promising innovation pilots to scale.**

5. Save the Children should build upon its emerging **central innovation management capacity to lead on an alignment of strategic efforts in driving forward coordinated technological innovation agendas across its federated structure.** Strategic growth of this capacity across the movement is essential for hiring new staff, and increasing co-creation of solutions with tech partners to build core innovation capacities, capabilities and competencies. In support of this agenda, committed resourcing, including more dedicated innovation staff positions, are needed. While this recommendation speaks to a broader, cross-thematic priority for the organization, **such a function should also have a well-considered, tailored approach towards migration and displacement as a unique context for technological innovation.**

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1. An aid worker holds a child rescued from a boat in May 2017. Families were rescued off the coast of Libya as part of our search and rescue mission and taken to Italy.

2. Save the Children staff work with children in a Children Friendly Space (CFS) for Iraqi IDP's fleeing the conflict.

3. Ahmad*, 6, and Nesreen*, 9, play with a friend on board Save the Children's search and rescue ship, having been saved in the Mediterranean. The two young children were among 100 people Save the Children rescued from a deflating rubber boat off the coast of North Africa.

*Name changed to protect identity

CHAPTER 1: INTRODUCTION

This study was designed to support Save the Children, and its peer organizations, in navigating the opportunities and challenges posed by the adoption of current and emerging technological innovations into child displacement programming.

Child displacement – as a result of conflict, natural disaster, climate change, or economic conditions – is a key thematic focus of Save the Children. As of 2016, one in 80 children worldwide was forcibly displaced. (UNICEF 2018). More than half of the world's displaced people, approximately 36 million, are children – and the trend is increasing, with the global number of displaced children having doubled over the past decade. (UNHCR 2017)

The rise in child displacement worldwide, and the programmatic responses of displacement-mandated aid actors like Save the Children, directly intersects with a rapidly evolving technological landscape.

The impact of technology on children's own experiences in countries of origin, transit, and destination suggests staggering rates and scale of change. (UNHCR 2011). How this change affects the displaced child and her/his family unit is, in turn, as much about politics, the changing nature of displacement drivers, and emerging global markets as it is about technology itself.

Rapid innovation and proliferation of information-communication technologies (ICT), tied to the explosive growth of smartphone use and internet connectivity across the Global South, are equipping children and their families with new strategies for negotiating displacement and broader mobility challenges. (RMMS 2016). As observed by the International Telecommunication Union (ITU), ICTs are an increasingly critical factor in how displaced people seek information and make decisions during migration:

"Distance-shrinking technologies" are one of the important drivers of international migration. And, in turn, migration provides the impetus for even greater connectivity. As migrants lead increasingly globalized lives – with friends, family and co-workers often straddling multiple geographic locations – staying connected to one another over vast distances has become a pressing necessity. ICTs provide the answer. Put another way, ICTs are now inseparable from migration and migrants. (ITU 2017).

At the same time, such technologies also expose displaced populations to new risks, including the appropriation of their digital data (such as call detail records, social media, and other forms of machine data-derived data) by state and non-state actors to target, exploit, and exclude displaced populations both within and outside their countries of origin.

Driven by a growing innovation ecosystem within the humanitarian and development sectors, aid organizations are simultaneously engaged in the adoption of existing technologies and development of new, tech-driven approaches into their programming. (Betts & Bloom, 2014; Ramalingam et al., 2015). Within the displacement context, a constantly widening range of technological innovations are fundamentally shaping the nature of traditional humanitarian and development programming practices which seek to support these same uprooted communities, as well as State's own migration management systems.

It is important to note that most technological domains relevant in child displacement programming are not, in fact, "new";; indeed, earlier iterations of these technologies have long influenced this field of practice in one form or another. (Lodinová, 2016). Nonetheless, particularly over the last decade, marked accelerated change within traditional technological domains, driven by new breakthroughs in commercial products and advances in data sciences, has fundamentally expanded the array of technological options for engagement with children and their families in displacement settings. From biometric registration systems to mobile surveys, humanitarian and development agencies of diverse sizes and varying mission profiles have incorporated digital technologies from prototype, to core components of their daily workflows.

Increased digital connectivity of displaced populations through mobile devices, for example, is creating both new pathways for potentially better assisting these often highly vulnerable populations. Aid agencies are rapidly integrating ICTs and digital platforms into their strategies, capabilities, and workflows across a wide range of contexts including displacement, often under the rubric of "humanitarian innovation". (Betts & Bloom 2014). Indeed, nearly 80% of "humanitarian innovation" activities involve the use of ICTs in some form. (ELRHA 2017)

Important gaps in understanding and guidance, however, currently limit current approaches to managing such rapid technological innovation. New innovation pilots regularly lack a robust evidence base to effectively target and measure their intended impacts – including those with potentially unintended negative consequences. (Elrha 2017). Understanding the scope of connectivity within displaced populations also remains challenging due to a lack of reliable quantitative data regarding penetration of ICTs, particularly with regards to demographic disaggregation (i.e. number of connected women, children, etc.). (Poole & Latonero 2018). And the development of best practices for mainstreaming these technologies in programming, including risk management procedures to ensure their safe implementation, has significantly lagged behind the financial investments the humanitarian sector has made into prototyping and testing new, humanitarian-specific applications of ICTs. (Campo & Raymond 2019).

Organizations such as Save the Children have significant new opportunities to improve their service delivery to displaced communities, whether in sites of origin, transit, destination or return, creating more efficient and targeted pathways for assistance along their journey. At the same time, displacement-mandated actors carry a crucial responsibility for anticipating, and safeguarding against any unintended negative consequences to these same populations that may arise from applications of these same technologies.

Within this context, designing and deploying digital interventions to assess, aid, and support displaced children and their families must be treated as a unique and highly complex operational setting unto itself. Furthermore, child displacement manifests across a range of modalities. Important differences exist between children's experiences and needs, for instance, as refugees compared to IDPs; in camp, rural and urban settings and on the move; or accompanied and unaccompanied. A number of other fundamental differences in profile, most obviously age and gender, demand further consideration in terms of how technology is introduced, utilized, and impacts displaced children.

At the programmatic level, Save the Children staff are confronted by an increasingly wide array of technological options, with both real and perceived potential to improve the capabilities of its programming around child displacement. Staying abreast of accelerating technological innovation in this area of work, and engaging with national and cross-border refugee, asylum, and IDP-management architectures of increasingly technical complexity, presents challenges in terms of training, capacity building, and guidance development.

At a strategic level, the organization needs to understand, anticipate and manage potentially disruptive near-future technologies in this space, including considering opportunities to capitalize as early adopters, and to manage adverse risks to child safeguarding posed by rapid introductions of new technologies. Save the Children must think about these technological changes in terms of its current approaches to integrating technological innovations throughout its child displacement work; and how, where, and when it plans to adopt new innovations in the future. It will also need to carefully consider where to advocate for, and engage with, wider political, regulatory, and ethical processes and instruments that seek to govern global digitization of data related to (amongst other populations) displaced people.

May*, 17 years old, is a beneficiary of Save the Children Health Programme in Za'atari Syrian refugee camp in Jordan.

*Name changed to protect identity

CHAPTER 2: KEY TECHNOLOGICAL DOMAINS FOR CHILD DISPLACEMENT PROGRAMMING

Child displacement is a topic that cuts across multiple thematic areas of the humanitarian-development nexus; as such, the range of technological innovations relevant to displacement issues within the wider aid space is vast.

To better bound this discussion, the authors of this study scanned a wide range of current and emerging tech domains relevant to child displacement, in order to identify priority areas of current and emerging innovation potential. Informed by consultation with Save the Children staff working on migration, displacement, and innovation work across the movement, and an accompanying desk review, **the following section presents five specific domains within the wider tech innovation ecosystem, which are suggested as strategically relevant priority areas** for Save the Children and other displacement-mandated organizations to focus innovation efforts on in the context of child displacement.

These domains include:

- **Registration and case management**
- **Digital connectivity**
- **Educational technology (EdTech)**
- **Predictive analytics**
- **Remote sensing**

It is important to emphasize that these five domains do not represent the total range of relevant spaces for constructive innovation engagement around child displacement. They are presented, rather, as starting points for structuring wider conversations around the topic.

The following subsections offer a summary of each domain in terms of its relevance in programming for displaced children and their families. Several "spotlight" case studies included throughout, further highlight examples of Save the Children-developed and/or adopted technological innovations, which represent reference points of emerging good practice for informing the child displacement innovation space.

2.1. REGISTRATION AND CASE MANAGEMENT

Beneficiary registration and cross-border case management has been arguably one of the most rapid and robust areas of digital adoption by the humanitarian and development sector within the past five to ten years. This includes the use of ICTs to support family tracing and reunification for unaccompanied and separated minors in emergency contexts.

Notable technologies that have become standard components of the humanitarian toolkit in this area include biometric identity management systems (BIMS), dashboard technologies – for example, in Mozambique, use of mobile devices to map referrals for providers. (Maestral & UNICEF 2017). UNICEF's Rapid Family Tracing and Reunification (RapidFTR) project, for instance, developed an app-based data storage system to collect, sort and share information about unaccompanied and separated children in emergency situations. RapidFTR was field-tested with Save the Children in Uganda and later scaled in a range of additional settings, including South Sudan and the Philippines.[2]

A particularly in-depth case study of ICT use in a child protection case management context with a significant cross border component was completed in 2016 by UNHCR, UNICEF, and ICRC in South Sudan and Kenya. While it was unable to identify potential correlative inferences between ICT use and reductions in child vulnerability, the study provides strong anecdotal evidence that these technologies improved coordination and efficiency across agencies engaged in case management. (Koanaga 2016: 8).

The leading example of registration and case management technology in child displacement programming is Primero/CPIMS+. Save the Children, the International Rescue Committee (IRC), and UNICEF have been working together since 2005 to promote the use of a standard inter-agency child protection information management system (CPIMS) for the child protection sector. CPIMS was originally designed to facilitate family tracing and reunification of

children in emergencies. In 2009, it was re-designed to support any thematic area of child protection, including supporting child protection systems building. In 2014, the development of a "next generation" web-based CPIMS+/Primero brought online and offline capabilities, a mobile app, and other features (see the "spotlight" box below for additional information). These changes were positive, improving the overall functionality of the platform and introducing critical additional features for enhanced privacy and security.

Despite the range of sophisticated technologies in use for child registration and case management, however, major gaps remain in the regulatory and ethical frameworks for the use of these tools and technologies with children, particularly in the area of BIMS. For example, the authors could not identify a single publicly available guideline stipulating when a BIMS can and cannot be utilized to register a minor. There also appears to be no specific guidance about the use of BIMS as part of birth registration for newborns and infants available from any humanitarian or development agency at present.

Near future trends in registration and case management

There are several near future trends in registration and case management that Save the Children should be aware of and monitor in the coming years.

First, there appears to be increasing "biometric fatigue" and pushback by populations that are being biometrically registered multiple times by multiple agencies for often redundant purposes. November 2018 protests in Cox's Bazar by Rohingya refugees frustrated, in part, by a perception of redundant registration and privacy and security concerns over sharing of their biometric information, is a key example of this phenomena. (Islam 2018). As more and more populations are being repeatedly registered through BIMS tools, this trend will likely be exacerbated and become more acute and pronounced amongst displaced populations.

Second, there will likely become a growing divide in the humanitarian community between those organizations who do engage in the use of BIMS, and those that refuse to deploy these systems due to ethical and safeguarding

SPOTLIGHT

Primero: Protection-related Information Management[3] / CPIMS+

Inspired by the Minimum Standards for Child Protection in Humanitarian Action, the Protection-Related Information Management (Primero) application offers a modern approach to data management which emphasizes user-friendliness and confidentiality. It is now live in 27 countries, with plans to continue roll-out at scale in an additional 17 countries over the next four years.

The goal of the project is to develop a single, secure, and robust solution for Child Protection data management, and to bring this solution to global scale. Primero is an information management system (IMS) which makes data handling easier for front-line protection and social welfare workers, freeing up their time for service provision and promoting improved quality of care. It also fosters accountability, helping supervisors monitor and report on the work of their teams, while helping to generate evidence for programming and policy at national, regional and global levels.

An open source software application, Primero helps partners securely collect, store, manage, and share data for protection-related incident monitoring, case management, and family tracing and reunification. Primero supports multiple modules, including the "next generation" of the field-tested, inter-agency CPIMS and GBVIMS legacy systems, which are currently in use in +20 countries. The new iterations, called the CPIMS+ and GBVIMS+, can operate separately or be deployed as integrated modules on the Primero platform. Strong inter-agency Steering Committees govern the use of each of these modules and provide support for the new system.

The technological design and governance mechanisms for Primero represent an iteration of existing best practice for registration and case management technologies developed for integrated case management of vulnerable children (see Maestral & UNICEF 2017).

Primero can be configured to accommodate a broad range of protection programming including gender-based violence, unaccompanied and separated children, release and reintegration, and social welfare programs. A strong emphasis has been placed on security and confidentiality, with intuitive design to simplify processes while promoting good practice. Role-based access and granular security ensure that only those who need to see data will have access to it.

2 HIF RapidFTR Final Report: https://www.elrha.org/wp-content/uploads/2015/01/UNICEF-RapidFTR-HIF-Final-Report-final.pdf
3 This spotlight is drawn primarily from available public documentation on the Primero project site: https://www.primero.org/

concerns, such as Oxfam. (Engine Room & Oxfam 2018). Agencies are already under increasing pressure – both from government donors to use BIMS, and privacy advocates to reconsider how and when these systems are used – to articulate clear, coordinated positions on how, when, why and under what ethical frameworks they will or will not engage with a now common tool in the humanitarian toolkit. While it is beyond the scope of this study to provide a specific position to Save the Children on whether to use BIMS in its work, any such decision will require careful consideration and organizational dialogue, guided by clear ethical frameworks (a point further explored in the next section, below).

Third, a critical, rapidly emerging area of case management innovation is the introduction of distributed ledger technology (DLT) and blockchains in the management of beneficiary registration data. DLT refers to the general category of technologies which enable the sharing of synchronized data across multiple geographies and actors. Blockchain technologies, a form of DLT, use encrypted "blocks" in a time-stamped, immutable chain of transaction records.

Applied to the displacement context, DLT offers the potential for providing beneficiaries with a permanent basis of digital identity that can "travel" with them globally, be shared (theoretically) in a safe, anonymized and accessible manner, and enable different aid organizations to provide various sectoral responses to the same beneficiary in a complimentary, layered approach that reduces unintended duplication. DLT has been particularly central in the evolving discussion around cash delivery innovation, suggesting new avenues for the transfer of digital assets. Data ownership by beneficiaries can potentially allow them the disruptive ability to own, store, access and utilize their own economic identities during and after crises, without the need for an intermediary like an NGO, bank or government. However, the use of DLT is still in its early infancy, and a range of significant technical challenges – alongside security, privacy, legal and regulatory risks – remain unresolved. Navigating these will require investments of strong technical capacity and clearer safeguarding guidelines within and across the wider aid sector moving forward. (Coppi & Fast, 2019).

2.2. DIGITAL CONNECTIVITY

Internet and mobile phone connectivity (hereafter "digital connectivity") are increasingly central to the displacement journey of uprooted children and families around the world. Such connectivity can serve as a lifeline through which populations can access information about their new environment, access services and support (including cash transfers, digital education, and job opportunities) and become connected to the national and global communities around them. (ITU 2017: 85)

While there are not yet comprehensive statistics on mobile phone ownership by displaced populations, it is an area of increasing focus. UNHCR figures show that refugees in 2016 were 50% less likely to own a mobile phone than non-displaced populations, but 90% of refugees in urban areas likely have access to a 3G network. (UNHCR 2016). Anecdotal observations of refugee transit patterns suggest, however, that many actively seek out access to Wi-Fi hotspots in their movement decisions. (BBC Media Action 2017). The significance of this apparent pattern of information-seeking behavior by displaced populations indicates that obtaining internet connectivity may be causing people on the move to make different decisions that prioritize information access over other forms of assistance.

Digital connectivity enables humanitarian and development response organizations to more effectively communicate with the populations they seek to serve, promoting two-way communication and feedback loops at every stage of the displacement journey. (UNHCR 2016, 2019). One recent example, from outside the displacement context, is Save the Children's Kolorob ICT innovation project, which targets community-service provider information gaps faced for Bangladeshi urban youth, by providing them reliable information on essential health, education, and child protection services via a free android mobile app.

Rebecca*, 6, and her sister Abi*, 5, are reunified with their mother.

*Name changed to protect identity

Save the Children staff member Ladislao Hernandez Santiago, Eco-technologies Promoter, demonstrates how to build an ecologically friendly and efficient wood-burning stove for members of the community in Coatecas, Oaxaca state, Mexico.

This point is also recognized in specific reference to migration and displacement by the Save the Children's "Protecting Children on the Move" program guide, which notes that:

"Information sharing about access to relevant services, practical advice on ways to keep safe, and legal advice is also vital when children and families are on the move. Information can be shared through mobile teams, information hubs, drop-in centers, child-friendly spaces, and access to helplines and mobile phones and through new technologies." (O'Kane & Newth, 2018: 20).

Relevant examples of how this technology is being used specific to the displacement programming context include, for instance, the establishment of Wi-Fi networks in IDP and refugee camps and the use of Call Detail Records (CDRs) for tracking the flow of displaced populations, respectively.

NetHope, in collaboration with humanitarian NGOs and private sector companies, such as Cisco, has been providing internet access to primarily refugee camp settings for several years now – enabling low-to-no cost use of mobile devices for displaced populations and supporting legal processes for asylum seekers through platforms like Skype.[4] Initiatives like the Signpost partnership between Mercy Corp and the IRC and supported by Cisco, Google, Microsoft and TripAdvisor, likewise offers a range of digital tools, web-based communications portals and Wi-Fi connectivity to provide time-sensitive information on legal rights and documentation, accommodation, medical care and other topics to refugees, asylum seekers and crisis-affected communities in Europe, Jordan and El Salvador.

And the use of call records from mobile phones resulting from triangulation of mobile device signals with cellular towers, are becoming more commonplace in enabling agencies to track large, rapid onset displaced population flows, such as those following the 2015 Nepalese earthquake, in near real time. (Wilson et al. 2016).

At the same time, displaced populations continue to face significant and enduring challenges in connectivity, common across urban, camp and rural settings. Major gaps still remain in our understanding of digital penetration and ICT usage behavior among displaced populations – including, importantly, gendered disparities in mobile phone access within households. (GSMA 2018). Nonetheless, available evidence clearly points to a range of common barriers – including lack of affordable devices and mobile services, poor literacy, lack of accessible language content, restrictions imposed by family members on device use, regulatory restrictions, legal barriers to accessing SIM and internet connections due to their lack of proof-of-identity documentation, and privacy and security concerns. (UNHCR 2016). As such, digital connectivity cannot be assumed within displaced communities, nor can the risk of exacerbating "digital divides" through over-reliance on ICT-driven approaches.

There is, at present, an emerging scholarly literature seeking to measure and understand demographic disparities in internet connectivity and access to mobile devices. Some data suggests that these disparities may correlate to either negative or positive impacts on the mental and physical health, food security, and human rights status of certain populations. (Poole et al. 2018). This emerging field is referred to as "tele-demography" – or the study of telecommunications-related behaviors specific to certain demographic cohorts. To date, little research has been done focused on the tele-demography of children on the move.

Near future trends in digital connectivity

Digital connectivity, more than any subdomain of ongoing technological change in the humanitarian sector, is fast becoming a core competency unto itself for humanitarian and development professionals. The establishment of specific units responsible for either leveraging mobile data for program decision support, such as the mVAM (mobile Vulnerability Assessment and Monitoring) unit at World Food Programme[5], or projects for actively creating two-way communication with mobile device connected displaced communities, such as Operation Signpost, are fast becoming normal features of agency organizational charts.

4 "Refugees Need Wi-Fi", Nethope: https://nethope.org/2016/05/05/refugees-need-wi-fi/
5 mVAM, WFP: http://vam.wfp.org/sites/mvam_monitoring/

In the next three to five years, it can reasonably be anticipated that cluster coordination structures will begin to adapt to include connectivity operations as both a part of current cluster activities, such as the Emergency Telecommunications Cluster[6] and UNHCR's "Communicating With Communities" efforts[7], and as core missions of new clusters, such as a cluster specific to Wi-Fi and cloud storage provision in IDP and refugee camp settings.

In light of the trends discussed above, Save the Children should begin now to determine and decide how activities such as technical provision of Wi-Fi services, deployment of two-way communication platforms with digitally-networked displaced populations, and dedicated digital data analysis units may or may not play a role in future programs. While some of these activities may need to become embedded capacities and competencies not currently present in Save the Children's toolkit, others may be provisioned through targeted, strategic partnerships with other humanitarian organizations and private sector entities already skilled in these areas. Regardless, a top-level process is required to identify how digital connectivity-related operations become an increasingly central part of Save the Children's portfolio.

At the same time, increasing reliance on remote communication to engage with beneficiaries raises the potential negative impact of encouraging greater distancing between aid actors and communities. (Donini & Maxwell 2013). New approaches seeking to better leverage digital channels of communication must therefore be carefully balanced with traditional, complimentary methods of dialogue, participation and feedback.

2.3. EDUCATIONAL TECHNOLOGY

Educational Technology (EdTech) is the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources. (Januszewski & Molenda 2008). In recent years, development and humanitarian actors have significantly increased investment in the development and deployment of bespoke EdTech solutions in a variety of contexts, including child displacement.

There are many examples of specific programming efforts targeting displaced populations specifically through EdTech. A notable illustration is the use of "serious games" to improve literacy amongst Syrian refugee children through the EduApp4Syria mobile app, which found "small, but positive, impact on literacy levels and psychosocial wellbeing for children playing them."[8]

Another well-known example is the initiative to provide Coursera products, an online education company, free to displaced children, young adults, and other refugee populations.[9]

Within its own work, Save the Children has already invested significant resources in exploring the EdTech space through a series of pilots focusing on the introduction and integration of child-centered educational software.

Several examples from this growing portfolio applied in defined displacement contexts include "Can't Wait to Learn", an education package focusing on literacy and numeracy learning, co-created and adapted for use with South Sudanese children in northern Uganda district as part of its Accelerated Learning Programme (ALP). The AGNEE pilot has been applied in numerous sites featuring displacement, including Cox's Bazar, where Save the Children has engaged 360 adolescent out-of-school Rohingya girls in Cox's Bazar through a virtual learning environment to provide them access to a digital national curriculum (Bangladesh, grades 6–10). The "Improving Learning and Education Together" (ILET) hosts a web-based data management platform for real-time data collection, processing visualization and provision of automated reports that help communities build evidence-informed school improvement plans for their communities. This system has been applied in multiple displacement contexts, including the South-Sudanese, Syria, and Venezuelan responses. The "Every Child Learning" partnership (see the "spotlight" box, page 17) has likewise introduced a new app for supporting Syrian refugee and host community child learning opportunities in Jordan.

A 2018 report by Save the Children UK, "EdTech for learning in Emergencies and Displaced Settings", further offers extensive recommendations on how the organization and its counterparts in the migration and displacement space can responsibly, ethically, and effectively leverage EdTech in-service delivery for children on the move. (Tausen & Stannard 2018). This thorough and focused assessment of opportunities and challenges is, at the time of this writing, unique in the sector, and positions Save the Children as a thought leader in the EdTech innovation space. To capitalize on this work, and ensure effective adaptation and scaling of EdTech in its migration and displacement programming, Save the Children should focus on socializing the findings of this research and make targeted investments based on the recommendations therein.

An additional important area of emerging focus is how to strengthen mental health and psychosocial (MHPSS) dimensions of existing and emerging EdTech initiatives in displaced contexts. To this end, it will be essential to consider the impacts – both intended and unintended –

6 Emergency Telecomms Cluster: https://www.etcluster.org/
7 "Communicating with Communities", UNHCR: https://www.unhcr.org/innovation/communicating-with-communities/
8 "Positive Evaluation Findings for EduApp4Syria", NORAD: https://norad.no/en/front/thematic-areas/education/innovation/eduapp4syria/positive-evaluation-findings-for-eduapp4syria/

of new technologies on children's well-being as part of wider educational program design. For example, there is a need to ensure children are taught to be responsible users of their own data when introducing them to new digital spaces enabled by EdTech innovations. While more research is needed on how MHPSS considerations apply to EdTech in displacement settings, analogous learnings from Save the Children's wider MHPSS work can directly inform this discussion.

principles that encouraged better user engagement – learning processes by humanitarian agencies, development organizations, and private sector entities that may improve the uptake and impact of new educational intervention.

Save the Children will need to continue developing expertise along these trendlines, as well as internal standards and external advocacy positions on how

SPOTLIGHT

"Every Child Learning": Increasing educational opportunities for Syrian refugee and host community children in Jordan[10]

Technology can play an important role in providing increased access to learning opportunities, as it can complement existing education systems and help to change behavior towards learning.

The pilot for this project, developed by Pearson and Save the Children implemented in partnership with the Jordanian Ministry of Education, was initiated in September 2017. It consists of a math learning app, "Space Hero" (Batlalfada), developed by Pearson, in collaboration with refugee and Jordanian children using learner-centered design approaches. It is designed to support a broader Save the Children led, in-school program focusing on teacher professional development, school community relations, after-school learning and psychosocial support. The app can also be found on the Google Play store to download for free, so that children can access learning anywhere at any time.

Two strands of work support children to re-engage with and accelerate their learning outside of school hours: the math app that encourages independent learning through game play, and teacher-led learning through remedial classes in Arabic language. Both strands are aimed at enhancing formal curriculum learning in two core subjects and are complementary to one another. Pearson has developed the app, initially for Grade 4, which aims to provide children with a fun way to engage in math learning and ensure they achieve grade-level competencies. It will facilitate the development of numeracy competencies aligned to the national curriculum of Jordan. Throughout the pilot phase, the math learning app will be updated to also cover the math curriculum for grades 5 and 6.

Research suggests that most families living in Jordan (Syrian and Jordanian) have at least one smart phone per household. However, as not all children in target schools will have access to a smartphone in their household, the project seeks to ensure fair access by providing schools with a library of smart phones for the short-term lending of devices to students. The smart phones will have the math learning app pre-downloaded and will be locked to prevent children from using these tools for other purposes, as well as safeguarding them from risks associated with open internet access.

Near future trends in EdTech

EdTech will continue to be an expanding area of digital engagement for humanitarian and development agencies alike in the coming years. Several near-future change and innovation trends lines are particularly relevant to watch for in this space. First, improvements such as "mesh networks", formed of connected devices, promise greater Wi-Fi penetration into low connectivity areas. (Al Saadi & Evans 2016). Second, a growing evidence base is beginning to provide better empirical data to help assess what does and does not work in specific EdTech interventions, and identify emerging patterns of cultural and demographic preference amongst displaced learning groups for certain solution types over others. (Joynes & Zoe). Third, there are increased efforts to "game-ify" – or apply game-design and game-playing

the humanitarian and development sectors should proactively engage and retrospectively react to innovations that will continue to shape EdTech through developments in these areas. As discussed on page 22–23 ("Selecting Safe, Ethical and Appropriate Technologies"), it will be crucial for Save the Children to develop a set of criteria for how, when, and why technologies that produce and share certain types of data, such as EdTech, should be selected in sensitive contexts, and the holistic impacts on children's wellbeing that may arise from their introduction to such technologies. This decision-support framework on deployment choices of tech is, arguably, as essential to Save the Children and other organizations engaged in this space as specific technological innovations themselves.

9 "Coursera for Refugees": https://www.coursera.org/refugees
10 This spotlight is drawn primarily from Wagener, 2018.

Children learning with the help of tablets and technology provided by a sponsor, Makani Centre, Zarqa, Jordan.

2.4. PREDICTIVE ANALYTICS

Predictive analytics, alternatively referred to in the literature as BDPA (Big Data and Predictive Analytics), is the general use of statistical models and algorithms to extract trends and patterns from existing data sets to anticipate likely future behaviors and phenomena.

Predictive analytics are being applied to a growing number of humanitarian and development purposes, such as efforts to predict extreme weather events, patterns of armed conflict, logistics, supply chain management, epidemics, and food security. (Dubey et al 2018). By comparison, there have been far fewer applications of predictive analytics in displacement contexts. This is beginning to change, however. In addition to Save the Children's Predictive Displacement initiative (see the "spotlight" box, page 19), other emerging examples include Danish Refugee Council's MM4Sight project[11] IDMC's disaster risk modelling[12], and UNHCR's "Project Jetson".[13] IOM (International Organization for Migration) is likewise investing significant time and resources in pursuing BDPA solutions specific to tracking displaced populations. (Nunes 2016).

Expectations regarding the ability of any single model to anticipate future events with 100% clarity will always be unrealistic and need to be tempered with a grounded recognition of the significant limitations of even the most advanced predictive methodologies. Nonetheless, existing pilot initiatives offer the potential for significantly improving early-warning capabilities, and informing multi-year operational planning, policy and advocacy around displacement crises. This will be of particular importance for informing programmatic design decisions around nexus issues such as child displacement, where early warnings of mass movements, alongside predicting the likelihood of emergency displacement becoming protracted, can equip organizations with invaluable foresight for planning and resourcing.

In order to best position itself to take advantage of the emerging potential for predictive analytics in predicting child-relevant displacement trends, Save the Children should invest in the relevant data science and informatics skillsets across its staff and partners to ensure continued development and adoption of new advances in this space.

The further design of any such models should be based on specific and attributable field requirements at key phases in the response cycle, draw from indicators which meet minimum standards of stability, validity and granularity, and use data that is obtainable at a consistent standard of quality and volume across all relevant contexts. Save the Children should also encourage and support knowledge and innovation partnerships between the growing number of organizations working on predictive analytics initiatives applied to displacement.

Near future trends in predictive analytics

Predictive analytics – both as a result of humanitarian-specific initiatives and through their general embedding into other product and platform offerings by the private sector used by civil society – are growing in sophistication and uptake. Such technologies are fast becoming mainstays of humanitarian situational awareness, supply chain, and decision support activities, a trend expected to further consolidate over the next five years.

Save the Children child protection manager Roberta Businaro helps to put a child safety bracelet onto a Rohingya refugee child.

11 Mixed Migration Foresight initiative, MMC: http://www.mixedmigration.org/mm4sight/
12 Disaster Risk Model, IDMC: http://www.internal-displacement.org/disaster-risk-model
13 Project Jetson, UNHCR: http://jetson.unhcr.org/

SPOTLIGHT

Save the Children's Predictive Analytics for Child Displacement Project

For years, aid agencies have been hampered in their humanitarian and development responses to child displacement because they cannot predict the duration (how long a crisis will last) and scale (how many people will be affected). As a result, they tend to focus disproportionately on short-term needs at the expense of long-term solutions. With better predictive forecasting of displacement's impact on children and families over time, aid workers and policymakers can make more informed decisions about whether to focus on short-term humanitarian aid or plan for long-term investments in core infrastructure, such as education, employment, and health care.

To address this gap in prediction and ensure children and families get the support they need, Save the Children's MDI, working with Boston Consulting Group, has created a prototype predictive analytics model that predicts the duration and scale of a conflict-induced forced displacement. Once a conflict-related crisis affects more than 25,000 people, the tool predicts how long the displacement will last (less than five years, five to 20 years, or more than 20 years) and the peak number of people who will be displaced (less than 175,000, between 175,000 and 600,000, or more than 600,000).

To develop the model, Save the Children began by conducting desk research and expert interviews to identify the key drivers that impact scale and duration for a conflict-related displacement. Next, it analyzed 97 conflict-related mass displacements from 72 countries, between 1960 and 2009, drawing from globally available public datasets. It identified 43 indicators with the potential to predict displacement, and used several complimentary modelling approaches to identify which indicators were most strongly predictive of displacement and scale.

MDI's predictive displacement tool has been recently tested in multiple countries where Save the Children is currently supporting children and families affected by mass displacements, including Burundi, Ethiopia, South Sudan, and Mali. These pilots show strong potential in supporting efforts towards long-term development planning, preparing host countries affected by long-term displacements, and helping governments appropriately allocate resources.

The tool is still a prototype, and limitations remain. MDI plans to further build the model to provide greater granularity and precision in its prediction, predict for other modalities of displacement beyond conflict-driven crisis (i.e. environmental and economic), and leverage a wider range of data sources and potential machine learning-driven approaches in its next iteration.

The importance of partnership has also emerged as a critical lesson from this initiative. Save the Children has also begun to develop wider knowledge-sharing partnerships with other leading migration and displacement-mandated organizations working on their own early-stage predictive displacement models – including the Danish Refugee Council (DRC) and the Internal Displacement Monitoring Center (IDMC). Its vision is to help build a robust, multi-sector predictive displacement ecosystem that can develop, incubate, and scale innovations for improving global responses to forced displacement. At the same time, Save the Children has recognized a current lack of sufficient in-house technical expertise and capacity to do so, and is seeking the support of leading technology experts in the public and private sector to help with the prototype's further development.

Other near-future trends in this space for Save the Children to track and engage with are not technological, but ethical. First, there will be an increasing drive towards common protection and ethical standards for when to deploy and not deploy predictive analytics to solve specific problems involving highly vulnerable populations, such as displaced children. Save the Children, as it seeks to use predictive analytics itself, should proactively engage (or continue to engage) with these efforts, offering to these consortia its unique insights on the displaced child in the specific context of digital interventions.

Second, questions are already emerging as to what rights beneficiaries whose information is contained within individual and group data sets have to refuse to be part of training data, and opt out of systems that may use their specific information to model large demographic patterns. Relatedly, the question is also arising as to what rights to rectification and redress these populations may have when BDPA tools make decisions that inadvertently cause them harm and/or advertently monetize their data for other purposes.

IOM has been a leader in seeking to develop consensus around potential ethical standards for tracking displaced populations – particularly as it relates to preventing providing potential inadvertent advantages to armed state and non-state actors seeking to target displaced populations through IOM and partner-provided BDPA solutions available publicly, both as processed data and open source solutions. (Nunes 2016).

2.5. REMOTE SENSING

Remote sensing focuses on the collection, analysis and processing of imagery data and other forms of geospatial data, such as thermal signatures and mapping data. (Voigt et al. 2016). This work is primarily done by humanitarians through the deployment of small commercial unmanned aerial vehicles (UAVs) and purchasing of commercial imagery collected by Earth orbital satellites.

Humanitarian agencies are applying remote sensing in the displacement context to detect previously unknown population movements in either non-permissive environments and/or over large geographic areas. Many organizations are making significant investments in this area, including in the development of developing feature extraction algorithms to automate certain humanitarian-related operations. (Quinn et al 2018).

Illustrative examples of remote sensing deployments by humanitarian agencies in displacement responses include the World Food Programme's (WFP) use of high and mid-resolution satellite imagery analysis to assess the food security status of displaced populations in non-permissive environments, and to detect population movement trends through environmental data. WFP, in partnership with Harvard University, conducted a pilot project to mainstream displaced population-related food security and human security assessments utilizing remote sensing into its suite of situational awareness tools. Meanwhile, advances in collection and processing of large-scale environmental data has allowed displacement trend and population movement detection to become more observable through Earth orbital sensors, such as in the case of the Rohingya displacement from Myanmar. (Hassan et al. 2018).

Despite the potential raised by remote sensing technologies, this study suggests that there are strong reasons for Save the Children to be wary of this domain as a strategic priority domain for innovation. Most importantly, effective management of remote sensing capacities requires not just sophisticated hardware, but also highly specialized technical and human resources to process, analyze and integrate this data into workflows.

Investments in basic remote sensing systems can cost hundreds of thousands of dollars at minimum – even when factoring in pro bono donations of satellite imagery data from external partners. In the future, there may be the necessary capacity, competency, and capabilities available to Save the Children to undertake this work at lower cost. At the moment, however, the start-up costs in terms of hardware, establishing remote information management architecture, and staff technical capacity-building will likely prove prohibitive.

Save the Children should instead seek to work with agencies, such as UN organizations and academic research centers, that have pre-existing capacity and competency in remote sensing when the agency believes that remote sensing analysis can support rapid assessment and program design objectives. Developing pre-existing partnerships with groups that have remote sensing already integrated into their workflows and operations is a more achievable and sustainable proposition than building internally a similar set of technical assets and human resources within Save the Children.

1. Ituri* and Petit* are both from North Kivu in the Democratic Republic of Congo (DRC), where Save the Children and its Emergency Health Unit are supporting 83 health facilities with building triage and isolation areas for suspected Ebola patients.

2. Phillipe* is a Save the Children-trained community health worker from Goma in the Democratic Republic of Congo (DRC) who runs Ebola awareness sessions for mothers.

3. Sara Rosia*, 7, a Rohingya refugee girl, shows off her new child safety bracelet, that she's been given by Save the Children.

*Name changed to protect identity

3

CHAPTER 3: SELECTING SAFE, ETHICAL, AND APPROPRIATE TECHNOLOGIES

The ethical dimensions of technological innovation are a central consideration across all five domains introduced in the preceding section, and more generally across the wider aid innovation ecosystem. Save the Children is currently reviewing its safeguarding approaches in response to these emerging challenges, although interviews with staff found more work needs to be done in aligning awareness of these efforts across the movement.

In this regard, Save the Children joins its peers as part of a wider sectoral debate about safeguarding concerns and broader ethical implications of new technologies, for which clear good practice related to child migration and displacement issues is still emerging.

Humanitarian and development organizations have been producing various types and iterations of code of conduct and governance frameworks for the humanitarian use of data and ICTs since the digital revolution commenced in earnest approximately 12 years ago. Soon after the first deployment of the Ushahidi platform in 2007, the crisis-mapping community, as a network of voluntary technical organizations, were among the first humanitarian actors to create some form of statement of principles as it related to ethics. However, given that the process of digitization began somewhat later in the humanitarian space, these early efforts were limited by a dearth of available, concrete case examples of potential harms posed by the use of digital data and ICTs.

It is primarily within the past three years that a significant specialization and maturation of "data responsibility" frameworks has emerged. OCHA's Data Responsibility brief, produced in the lead-up to the 2016 World Humanitarian Summit (WHS), was one of the first documents to articulate a sector-wide recommendation for individual organizations and networks to not only create their own frameworks, but also ensure that they are consistent with humanitarian principles and interoperate with the approaches of colleague organizations.

Two important trends currently define the discussion around responsible data and innovation in the aid sector. First, there is an increased and welcome focus on the creation of operationally specific guidance, sometimes even at a cluster level, to guide either individual agencies or groups of agencies through distinct operational texts, such as mobile surveys, satellite imagery analysis, or sharing sensitive data. Second, while more agencies are producing individual codes and frameworks, there is a growing, complimentary and shared pedagogy of source materials being commonly cited across these documents. This corpus of generally recognized best practices, relevant case studies, and templates for developing new frameworks spans both humanitarian and development practice.[14]

However, this emerging work has to date not been specifically adapted to a child displacement-specific context. While good practice on the safeguarding of children from online harm exists, currently available ethical, legal and technical guidance on a range of other programmatic implications – from issues of biometric registration of minors to appropriate online communication strategies to reach children in crisis settings – remain under-developed.

As Save the Children expands its leveraging of technologies across these domains in support of its child displacement programming, a standard set of criteria for the assessment of different technologies will be an essential key to ensuring safe, ethical, and appropriate technology-enabled work.

Such criteria will improve the process through which technologies are identified for use in the design and delivery of programs, while also aiding in the prioritization of different innovation investments within the different domains of focus. To this end, Save the Children should adapt a simple, rights-based framework for assessing the degree to which particular technologies represent safe, ethical, and appropriate choices for child displacement program delivery.

14 I.e. Digital Impact Alliance "Principles for Digital Development": https://digitalprinciples.org/about/

At present, few benchmarks likewise exist for assessing whether an organization is meeting its basic ethical obligations and professional standards around technology usage under core tenets of humanitarian doctrine. One exception is The Signal Code: Ethical Obligations for Humanitarian Information Activities (hereafter "Obligations"), originally developed by IOM and the Harvard Humanitarian Initiative (co-developed by this study's authors), and currently used to inform demographic and group data decision-making at organizations including OCHA, WFP, and IOM. (Campo et al. 2018).

The rights-based approach presented by the Obligations framework is relevant to displacement interventions across both development and humanitarian contexts. It translates and applies the foundational sources of ethical humanitarian practice to humanitarian information activities, such as the use of mobile devices for two-way communication with affected populations, Wi-Fi provision, data collection, storage, and analysis, and biometric registration tools, amongst others.

The framework sets out nine core obligations that are consistent with and incorporate the ethical obligations that bind and define all humanitarians through the ICRC Code of Conduct (ICRC 1994), the Humanitarian Charter (Sphere 2018), the Core Humanitarian Standard (Sphere 2014), and other relevant accepted sources. Collectively, the authors suggest, they can serve as one potential starting point for Save the Children's development of its own framework:

- **Affected population needs** | Organizations ensure that information activities (IAs) are based on the needs of affected populations – in the context of child displacement programming, this means the distinct needs of populations affected by displacement are specifically considered.
- **Competency, capacity, and capability** | Organizations maintain minimum standards of competency, capacity, and capability throughout the course of an IA.
- **Agency of affected populations** | Organizations ensure and encourage the agency of affected populations throughout the course of an IA.
- **Minimize adverse effects** | Organizations identify and minimize adverse effects throughout the course of an IA.
- **Meaningful consent** | Organizations promote and protect the dignity of populations by ensuring free and meaningful consent, and by abiding by internationally accepted human subjects research protections throughout the course of an IA.
- **Ensure data privacy and security** | Organizations ensure data privacy and security at every stage of an IA.
- **Reduce future vulnerability** | Organizations ensure that humanitarian information activities strive to reduce future vulnerability and neither degrade nor disrupt local capacity.
- **Coordination** | Organizations coordinate, ensure complementarity, and prevent duplication of efforts in designing and implementing IAs.
- **Transparent and accountable** | Organizations are transparent and accountable throughout the course of an IA.

A health worker in Wajir, Kenya screening a child for malnutrition, using the Community-based Management of Acute Malnutrition app.

CHAPTER 4: SAVE THE CHILDREN'S INNOVATION ECOSYSTEM

Alongside the identification of specific promising technologies for improving their work with displaced children, Save the Children and other displacement-mandated organizations must also consider their own internal innovation management systems, and wider innovation ecosystems, through which such products and processes are identified, piloted and scaled.

Save the Children, in particular, is engaged in a growing tech innovation agenda across its federated structure, as illustrated by several examples shown in this document. This emerging momentum, building on decades of broader innovation experience, offers an exciting moment of opportunity for accelerating the organization's parallel mission of improving its child displacement programming agenda. But to most effectively leverage current and future innovation opportunities for better child displacement programming, it must also identify and address gaps in its current innovation management capacity.

To that end, the following section presents an overview of the methods and resources with which Save the Children manages innovation for impact. It also offers a brief snapshot of how the broader humanitarian and development communities are approaching innovation at the sector level. Finally, it presents observations based on the research of opportunities for growth within Save the Children's current approach to innovation, situating these opportunities within the context of child displacement programming.

4.1. INNOVATION IN HUMANITARIAN AND DEVELOPMENT ECOSYSTEM

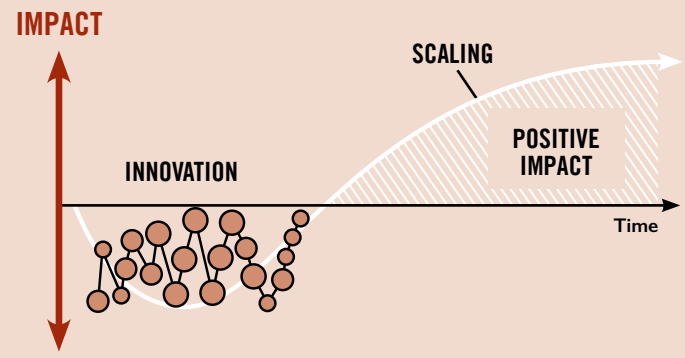
The global humanitarian and development communities have increasingly invested in innovation to improve the reach and impact of their work over the last ten years. As the innovation landscape has matured, so too has the evidence base on what effective innovation for impact looks like across the humanitarian and development nexus. In a 2016 study of innovation for social impact, Seelos and Mair (2016) found that investing in scale is critical to realizing impact through social innovation.

"Productive innovation depends on two factors: (1) an organization's capacity for efficiently replacing innovation uncertainty with knowledge, and (2) its ability to scale up innovation outcomes by enhancing its organizational effectiveness. Innovation and scaling thus work together to form an overall social impact creation process. Over time, an investment in innovation – in the work of overcoming uncertainty – yields positive social impact, and the value of such impact will eventually exceed the cost of that investment. But that will be the case only if an organization is able to master the scaling part of this process."

Organizations tend to invest disproportionately in the first three stages, limiting the growth of their capability to transition innovations to scale, scale them, and sustain their implementation once scale is reached. As organizations invest increasingly in innovation for impact in the development and humanitarian sectors, they must move beyond the early stage innovation "hype-cycle" and focus on investing in scale.

A number of other guiding principles for humanitarian innovation have emerged from recent good practice. (See, for instance, Betts & Bloom 2014; Elrha 2017, 2019; IDIA 2017; McClure 2019; Ramalingam et al. 2009, 2015).

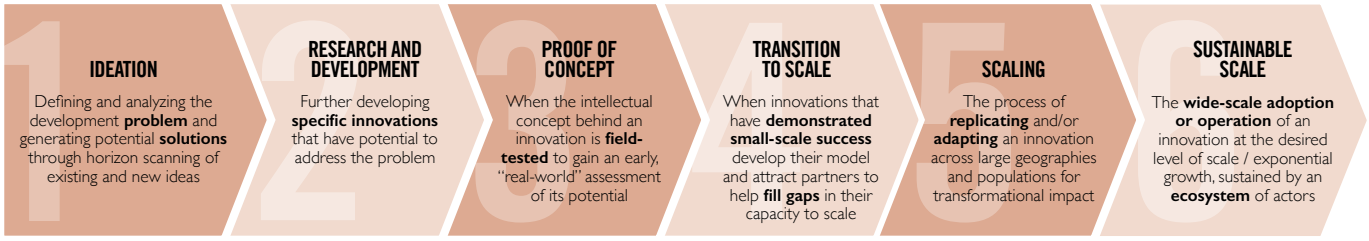
CREATING SOCIAL IMPACT: INNOVATION PLUS SCALING



Source: Seelos, C. and Mair, J. (2016). "When Innovation Goes Wrong". Stanford Social Innovation Review.

This trend is reinforced in the work of the International Development Innovation Alliance (IDIA), which provides a helpful framework for understanding the innovation landscape – particularly for organizations focusing on the later stages of the innovation and scaling pipeline (pictured below).

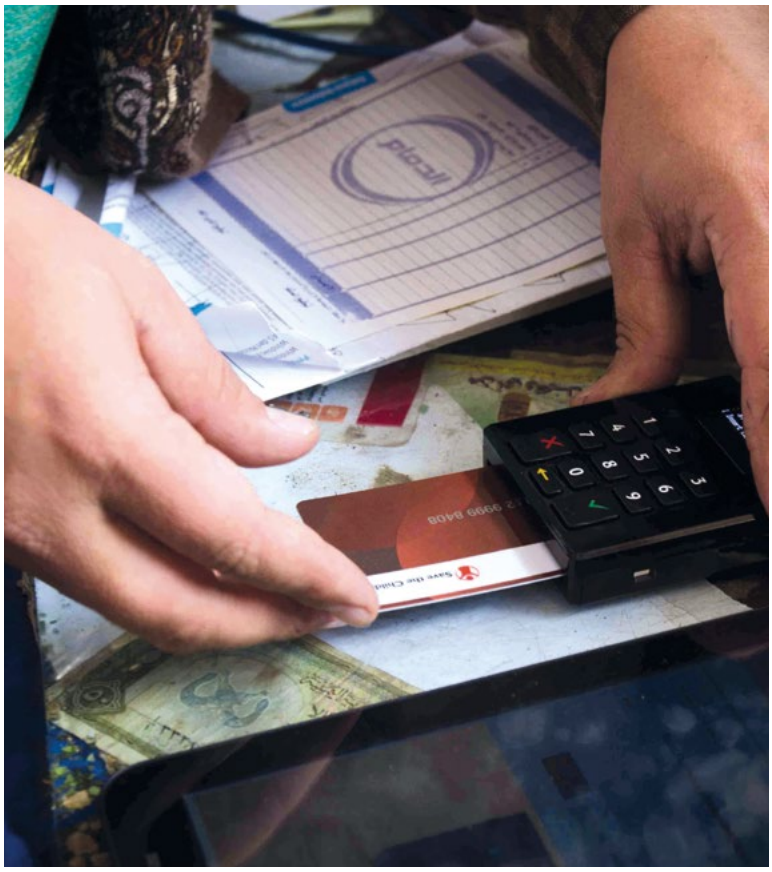
SCALING STAGE



Source: IDIA. (2017). "Scaling Innovation: Good Practice Guide for Funders".

While beyond the scope of this report to summarize these in detail, another essential concept is the importance of **human-centered design approaches**, including the participation of end-users in the co-design of new innovations – technological or otherwise. Human-centered design aligns directly with established commitments to beneficiary participation in traditional program design, and speaks to broader engagement with the evolving localization agenda. As such, it should likewise be a central approach to any efforts at innovation in the child displacement context.[15]

In response to the food crisis in Yemen, Save the Children is distributing food baskets to 3, 500 families in Dhamar Governorate, using an e-card system through which they can pick up their food from a local vendor.



4.2. INNOVATION MANAGEMENT AT SAVE THE CHILDREN

Save the Children defines innovation as "the development of a novel or disruptive approach, product, program, or partnership that dramatically increases Save the Children's ability to realize strategic breakthroughs for children – ensuring all children survive, learn, and are protected from violence."[16] The theory of change (pictured below-right) for innovation at Save the Children places a strong emphasis on the act of innovating, that is: developing and proving evidence-based, replicable breakthrough solutions to problems facing children.

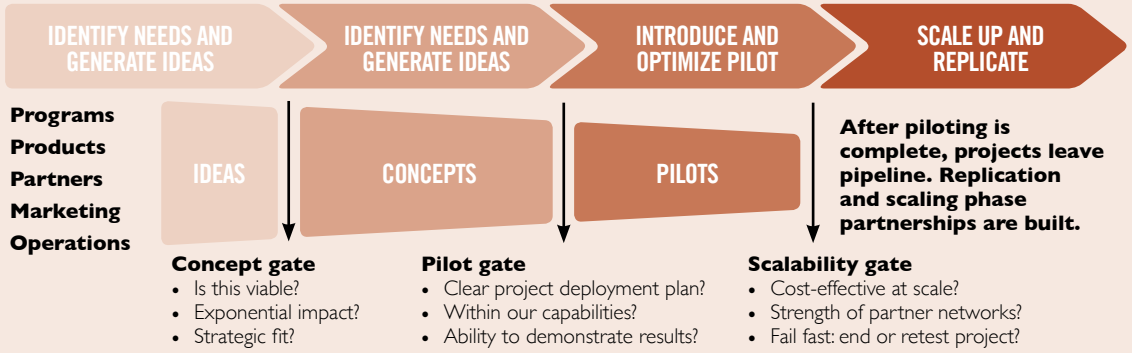
OUR THEORY OF CHANGE

Source: Breakthrough Innovations for Children

This focus is underscored in the current approach to fostering innovation within Save the Children as depicted on the image on page 26, the Save the Children "Innovation Accelerator" comprises four stages: identify needs and generate ideas, develop and validate concept, introduce and optimize pilot, and scale up and replicate.

15 See, for instance, IDEO's "Human-Centered Design Toolkit". At https://www.ideo.com/post/design-kit
16 Save the Children (2018). "Breakthrough Innovations for Children". Source: https://savethechildren1.sharepoint.com/who/Innovation.

OUR INNOVATION ACCELERATOR



Source: Breakthrough Innovations for Children

Analysis of tracked innovation initiatives in Save the Children's "Innovation Library" shows that a majority (73%) of the projects fall under the "generating ideas" and "developing concept gate" stages, compared to "Introducing and optimizing pilot" (25%) and "scale up and replicate" (2%).[17] A limited number of projects (2%)[18] in the Library note a focus (direct or indirect) on migration and/or displacement-specific issues or populations. **This suggests, first, that while the organization is actively ideating and piloting new innovations, it can do more to bring promising innovation pilots to scale; and second, that there is an opportunity to increase the number of projects directly targeting unique needs of children in displacement settings**.

Beyond specific efforts to resource innovative initiatives, Save the Children is also investing in improved coordination of learning and technical support around innovation. In terms of human resources, the research identified a number of focal points across the organization with innovation mandates and several ICT4D positions. The dedicated efforts of this core group of staff have resulted, in recent years, in improved coordination of learning and technical support for innovation management processes, further facilitated by new mechanisms such as the Humanitarian Innovation Platform, which meets regularly to coordinate on shared innovation priorities, and a movement-wide network of "innovation champions". This trend signals the global commitment to a more cohesive and strategic approach to innovation management, and an architecture for enabling child displacement-specific innovations alongside other areas of focus.

At the time of writing, a global innovation white paper was also under development to further articulate the overall approach to innovation at Save the Children. This will be a welcome addition to the at present limited array of guidance and reference documents available to staff interested in designing or adapting innovations into their programs.

Interviews likewise identified the need for Save the Children to further expand its dedicated, full-time FTE or consultant roles focused exclusively on innovation management (technological or otherwise). Peer organizations, such as UNICEF, have multiple dedicated innovation managers and/or consultants at both regional and headquarters level, many at full-time. The current approach to human resource management for innovation within Save the Children, in contrast, has frequently leveraged percentages of time from senior technical and management staff across the organization to provide support to activities related to innovation. This approach has proven effective at building a coalition of staff interested in and committed to fostering more innovation within Save the Children (e.g. the Innovation Champions network referenced above), but it will be important to build on the recent trend of establishing and sustaining more dedicated technical support for innovation strategy and a deeper level of management across the organization.

Against this backdrop, Save the Children is well positioned to carve out a strong position for itself in the humanitarian and development innovation landscape – both at the global and country levels. This positioning is particularly strong within the child displacement context, given Save the Children's comparative advantage and programmatic expertise in this area. By investing in more effective innovation management and a more systematic embedding of new and emerging technologies in service delivery models with a child displacement lens, Save the Children stands to increase the impact of this immediate work while also establishing itself as a first-mover in the space.

17 "identify needs and generate ideas" (197 projects), "develop and validate concept" (79 projects), "optimize pilot" (92 projects), and "scale up and replicate" (8 projects).
18 This was estimated by searching the library with the terms "migrant" and "migration" and "refugee" and "displaced" and "displacement".

4.3. HOSTED OR AFFILIATED PLATFORMS FOR PROMOTING INNOVATION

One of the more unique features of Save the Children's innovation capability lies in the set of alliances, initiatives, and networks designed explicitly or in part to promote innovation in the humanitarian and development sectors, that have been either hosted or directly supported by Save the Children in recent years.

At present, however, these consortia are not either directly connected or leveraged specific to the child displacement context, according to the KIIs conducted for this study. Going forward, Save the Children should seek to connect, coordinate and leverage these extant fora for studying, incubating and improving innovation practice to its innovation strategy related to child displacement to the maximum degree possible and appropriate. Doing so will be critical for increasing efficiency and value-for-money of investments in innovation research, and onboarding extant best practices and lessons learned from Save the Children's existing innovation work.

Several key actors include, for instance:

- The **Humanitarian Innovation Fund (HIF)**[19], a program of Elrha, aims to improve outcomes for people affected by humanitarian crises by identifying, nurturing and sharing more effective, innovative and scalable solutions. Elrha was originally hosted by Save the Children UK, before moving to independent charity status in 2018. The HIF itself is a globally recognized program leading on the development and testing of innovation in the humanitarian system. Established in 2011, it was the first of its kind: an independent, grant-making program open to the entire humanitarian community. It is now a leading actor in funding, supporting, and managing innovation processes. The HIF's portfolio of funded projects has informed a more detailed understanding of what successful innovation looks like, and what it can achieve for the humanitarian community. This work is leading the global conversation on innovation in humanitarian response. The HIF has made important contributions to innovations in the child displacement space, including an early stage investment in RapidFTR[20].
- The **Response Innovation Lab (RIL)** is a global collaboration between several leading nonprofit organizations that exists to solve real, on-the-ground humanitarian problems, of which Save the Children is an active (and original founding) member. It creates a cross-thematic, multi-sectoral space where the unique challenges posed by a specific humanitarian crisis can be identified and aims to help local actors develop customized solutions fit for the unique challenges of chaotic relief environments that are both innovative and in line with humanitarian ethics and standards[21].
- The **Global Alliance for Humanitarian Innovation (GAHI)** works to scale innovation in the humanitarian system, convening humanitarians, businesses, governments, and innovation hubs together around collective challenges. GAHI was formed at the 2016 WHS in recognition of the need for collective action to meet soaring levels of need, and initially hosted by Elrha with legal and administrative hosting by Save the Children UK. GAHI is specifically exploring effective ways to link training for migrants, refugees and IDPs to relevant jobs, and to ensure these approaches acknowledge the realistic duration of displacement. It is also producing research on emerging technologies, including a recent report on blockchain and distributed ledger technologies, for the humanitarian sector. (Coppi & Fast 2019).
- The **Start Network**, hosted at Save the Children UK until May 2019 when it became an independent charity, coordinates 42 aid agencies worldwide in managing rapid-response early action pooled funds, risk financing pilots, and humanitarian innovation management mechanisms. It maintains an active portfolio of innovation initiatives with relevance to displacement contexts. It maintains a Disasters and Emergencies Preparedness Programme innovation lab network to identify and grow areas of community-drive innovation in crisis settings, including a joint initiative with the International Refugee Committee in Jordan that focused on supporting proposed innovations from Syrian refugees living in protracted displacement. It also runs the Migration Emergency Response Fund, designed for rapid response to acute and emerging gaps along migration routes.[22]

As a current or former co-founding member and/or host of these various structures and networks, Save the Children has played a critical recent role in incubating and fostering sector-wide innovation, and remains well-positioned to leverage the expertise, reach, and resources that these and other innovation entities offer. **However, findings from the research suggest that staff outside of the Save the Children member headquarters where the respective initiatives are supported have limited to no awareness of these platforms.** This restricts the degree to which Save the Children is able to take advantage of the tremendous resources at its disposal, and also signals a disconnect between global engagement on driving innovation within the humanitarian and development sectors broadly and efforts to do so within Save the Children as an organization.

19 Humanitarian Innovation Fund (HIF): https://www.elrha.org/programme/humanitarian-innovation-fund/
20 HIG website project page on RapidFTR here: https://www.elrha.org/project-blog/rapidftr-rapid-family-tracing/
21 Response Innovation Lab (RIL): https://responseinnovationlab.com/
22 Start Network: https://startnetwork.org/

CHAPTER 5: CONCLUSION – FINDINGS AND RECOMMENDATIONS FOR INVESTMENT

The preceding report presents an initial framework for thinking through next steps in how Save the Children, and its peers, can design and deliver technology-enabled innovations for better child displacement programming. Below, findings and recommendations are provided to summarize and suggest next steps.

5.1. FINDINGS

First, in mapping key emerging trends and opportunities in the innovation ecosystem, **this study identified five technological domains of current or emerging priority for child displacement programming.** These include:

- Registration and case management: including the use of biometrics to manage identity of displaced individuals and populations, as well as software platforms for family tracing and reunification;
- Digital connectivity: leveraging growing mobile phone and internet usage worldwide to improve reach and delivery of services to displaced populations, and better support Save the Children staff in programmatic implementation;
- Educational technology (EdTech): software and hardware designed directly for use by children, teachers, parents or facilitators to provide education to hard-to-reach populations, including displaced and populations on the move;
- Predictive analytics: particularly models drawing from big data for early warning/strategic planning around child displacement;
- Remote sensing: the use of geographic information systems (GIS) incorporating data from satellites and aircraft, including drones, to monitor mobile populations.

Second, there are **several clear examples of where Save the Children has already successfully adopted and mainstreamed extant technological innovations into its workflows and procedures around child displacement,** including several innovation case studies included as "spotlights" throughout this report. The preceding discussion has spotlighted, among other examples, Save the Children's (i) development and adoption of its Regional Information Management System (RIMS) Primero/CPIMS+ case management system; (ii) its "Every Child Learning" EdTech initiative focusing on increased educational opportunities for Syrian refugees in Jordan; and (iii) MDI's Predictive Analytics for Displacement project.

Third, interviews conducted with staff across the organization emphasize both **opportunity and constraints** in its broader approach to innovation management, with relevance for both child displacement and cross-thematic programming.

- On the one hand, **Save the Children is currently moving towards a more strategic approach towards prioritization and investment in resourcing of its digital transformation and innovation management capacity.** This progress, driven by several parallel centers of gravity across the movement, has important implications for improving the efficiency and impact of its traditional child rights programming. This study suggests that the organization is currently strongest at innovating best practices for adopting and integrating existing tools and technologies into established programmatic areas of competency.

- On the other hand, the study also identified **a number of key constraints stemming from a fragmented innovation management capability** across the movement, including in relation to the use of technologies in program areas relevant to child displacement programming, which currently needs to be addressed to better harness and leverage such aspirations. In particular, there are gaps in technical capacity across key skillsets important for technological innovation (i.e. data science and informatics), the continued need both to resource more dedicated, innovation management staff positions, better leverage both existing organizational capacities (at member, regional, and country level), and build/deepen partnerships with relevant external stakeholders and innovation experts.
- To this end, respondents identified the need for Save the Children to implement targeted, coordinated, and consistent investments in the capacities required to effectively identify, adopt and scale new technologies most relevant to child displacement. In this regard, the organization is well-positioned to inform such innovation agendas from its deep existing foundation of technical expertise around displacement programming, integrated within its emerging centralized innovation management capacity.

Fourth, digital technologies pose a range of ethical risks (including traditional risks exacerbated by the use of ICTs) that are often unaddressed by traditional safeguarding approaches. These include traditional risks and threats to displaced children and their families that may be magnified and exacerbated by the use of ICTs by humanitarian and development actors, including impediments to the displaced child's right to:

- access and communicate relevant information during a crisis;
- be protected from potential threats and harm resulting directly or indirectly from the use of data;
- expect privacy and security of their personal information;
- maintain their data agency, i.e. their right to agency over the collection, use and disclosure of personally identifiable information;
- receive rectification and redress of inaccurate or incomplete personal data.

Within this context, the study found that Save the Children, while the industry leader in child safeguarding policies and procedures, does not yet have child safeguarding policies and procedures specific to assessing, preventing, and mitigating the new risks, threats, and harms that may come from digital tech. The lack of policy and guidelines, including ethical and technical frameworks for digital technology management in the field, is a shared gap across the sector, and represents both an opportunity and a responsibility for Save the Children to lead on developing improved child data and innovation safeguarding guidance.

Fifth, Save the Children is unique amongst other migration and displacement-mandated aid organizations in that its members currently host or are closely affiliated with several leading innovation-related humanitarian consortia – including Save the Children UK's relationship with the Global Alliance on Humanitarian Innovation (GAHI), Elrha's Humanitarian Innovation Fund (HIF), and the Start Network, and the wider organization's role as a founding member of the Response Innovation Labs (RIL). However, across the movement, staff seemed to not be broadly aware of Save the Children's relationship to these consortia, nor had general awareness of the products, services, and research specific to innovation that these Save the Children supported consortia provided. There is a significant under-leveraged opportunity to connect the proposed investment areas identified in this study directly into the work being done by these consortia, and in future, other relevant actors across the movement.

Vanessa* is a Venezuelan migrant living on the streets in Colombia.

*Name changed to protect identity

5.2. RECOMMENDATIONS

Based on these findings, the authors present the following recommendations to improve Save the Children's use of technological innovations for impact in child displacement programming.

1. The study recommends **five key, interlinked areas for innovation investment** to enhance Save the Children's overall programmatic capabilities related to child displacement. "Investment", in this context, may entail financial, technical, or human resources (or a combination of the three), as well as the formation of new partnerships (or leveraging of existing partnerships) with public and private-sector partners.

a. **Registration and case management: Support greater responsible adaptation of ICTs for cross-border case management, including technologies for child registration.**

   i. Conduct a more targeted and comprehensive scan across Save the Children of the different technologies currently in use for case management (including cross-border context), and maintain a central register of the tools in use, including their strengths and weaknesses;

   ii. Develop more specific programmatic guidance for Save the Children field staff on how to identify, select, adapt, and deploy available technologies for case management.

Zito's* home was flooded during Cyclone Kenneth in Mozambique.

b. **Digital connectivity: Develop child connectivity assessment tools for measuring connectivity of displaced children and their families, in order to inform the design of interventions that rely on connectivity to deliver services.**

   i. Create the first child and family connectivity/mobile device access assessment tool for use in protection, monitoring and evaluation, program design, and rapid assessments;

   ii. Establish partnerships with external technical experts, private sector (including groups like GSMA), and local stakeholders to test a connectivity assessment method in different environments.

c. **EdTech: Convene and improve collaboration with partners around further refinement and deployment of EdTech solutions tailored to child displacement contexts.**

   i. Continue to ensure that new EdTech is integrated into existing and new work streams as part of holistic programmatic design for child migration and displacement interventions.

   ii. Identify displacement contexts where Save the Children and other organizations, states, and private sector partners are already engaged in the use of EdTech for learning, and establish more robust mechanisms for coordination and collaboration.

   iii. Organize internal and external events (e.g. webinars, workshops) to further socialize the findings from Save the Children's "EdTech for Learning in Emergencies and Displaced Settings" report. (Tausen & Stannard 2018).

   iv. Identify and ensure considered integration of MHPSS dimensions in the holistic design of programs featuring new EdTech.

d. **Predictive analytics: Deploy decision-specific predictive analytics within one or two test contexts, with a specific focus on supporting displacement programs.**

   i. Use the current MDI predictive analytics pilot to model an intentional process for identifying specific needs for automated/semi-automated decision support, ensuring they are a) based on specific and attributable field requirements at key phases in the response cycle, and b) ethically, legally acceptable based on pre-established criteria and child digital safeguarding procedures.

*Name changed to protect identity

ii. Engage external counterparts for research support as a prerequisite for developing predictive analytics tools, including a) ensuring strong/reliable training data for the identification of a child as unit of measurement and/or b) adult-led family group including child as unit of measurement.

iii. Connect to existing sector-level processes (e.g. IOM Working Group on Predictive Analytics and Ethics) to support more detailed review, audit and safeguarding capacity within Save the Children. In turn, invest in more robust field feedback/M&E to evaluate potential field impact.

e. **Remote sensing:** Given the high start-up costs in terms of hardware, information management architecture, and staff technical capacity-building, Save the Children should prioritize investing in partnerships with agencies, such as UN organizations, academic research centers and the private sector, which already have pre-existing capacity and competency in remote sensing.

2. Each of the priority areas presented in recommendation One (page 30) also affords opportunities for different partnership models through which child displacement-mandated organizations like Save the Children can have a convening role amongst other humanitarian and development organizations, civil society, and the private sector. Existing and emerging tech-sector relationships across the movement provide strong starting points, but this study calls for Save the Children to take a convening role in building multi-stakeholder innovation partnership platforms, building on its established leadership in the child displacement space.

3. Save the Children **must ensure that its child safeguarding guidance keeps pace with new technologies it adopts for work in child displacement programming.** This commitment requires not only regular updating of established guidance as new innovations in digital technology emerge, but also a concurrent effort to ensure that new guidance is systematically applied throughout the organization.

While also engaging in the wider debate about digital ethics and child displacement, and building on its established experience in developing child safeguarding policies and procedures, **Save the Children should specifically lead on the establishment of sector-wide child safeguarding best practices specific to digital risks and harms relevant to children affected by migration and displacement.**

This effort could:

a. Build on industry-leading child safeguarding guidance and practice to incorporate digital safeguarding;

b. Take concrete measures to fill the extant gap in guidance on protection of children in technology-driven or enabled programming;

c. Commission additional research, modeling/piloting projects, and sector-wide convenings to support co-creation and adoption of guidance for protection of children in the use of ICTs;

d. More effectively leverage and engage existing innovation platforms and consortia (i.e. Elhra/HIF/GAHI) to convene and advise on this area of practice.

4. Save the Children claims a growing portfolio of innovation initiatives that are integrating existing and emerging technologies into established programmatic areas of competency. **Within the area of child displacement,** it should ensure that:

a. Existing and emerging innovations are sufficiently linked to specific programmatic tasks and purposes, such as case registration and predictive displacement;

b. More effort and resources are dedicated to bringing promising innovation pilots to scale.

5. Save the Children should **continue to build on its emerging central innovation management capacity to lead on alignment of strategic efforts in driving forward coordinated technological innovation agendas across its federated structure.** While this recommendation speaks to a broader, cross-thematic priority for the organization, **such a function should also have a well-considered, tailored approach towards migration and displacement as a unique context for technological innovation.** To this end, it should:

a. Invest in **more dedicated human resources** with deeper expertise in specific technologies, (such as data science and informatics), and migration/displacement skillset;

b. Promote **greater staff awareness and understanding** of Save the Children's overall approach to innovation and the related resources available, including alliances and platforms like GAHI, HIF, RIL, START Network, and others;

c. Introduce more **robust evidence-generation methods** as a key component of any new innovation initiative, to ensure effective and rigorous monitoring and evaluation of its effectiveness and impact.

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ANNEX: METHODOLOGY

The methodology for this four-month study, conducted between October 2018 and February 2019, consisted of a combined desk review and series of 52 interviews. Respondents included 30 key informant interviews (KIIs) with staff at SCI, national members, and regional and country-level offices based on a semi-structured questionnaire. Other relevant subjects for KIIs were identified in the process of conducting the initial KIIs with subjects identified jointly by MDI staff and the authors. An additional 22 consultations, including three focus group discussions (FGDs) in Copenhagen, were held in February 2019. Primary documents – both internal to Save the Children, including specific national affiliates, and external documents in the technical literature – were also reviewed as part of this study.

A "light snowball" approach was taken in which respondents could identify up to two additional individuals – both within and outside SCI – for inclusion in the KII process. A decision was made by the authors, which was based on the substance and scope of issues being raised by initial KIIs, to limit the participants to only SCI and national affiliate personnel – a change from the initial plan to include outside technical experts as well. Primary document review was also conducted that included material pre-identified as relevant by MDI research staff and discovered by the study authors during the process of completing the KIIs.

The rationale for selecting this methodological approach – KIIs combined with primary source review – was based on the assumption that other methods, such as country team visits, regionally focused analyses, etc, would be too detailed, at this stage, to appropriately diagnose SCI ecosystem-wide opportunities and challenges related to technology innovation, adoption and deployment by MDI, specifically, and SCI, writ large. The findings of this study, in the opinion of the authors, support the more global, organization-wide approach taken. Further work, however, may require a case study-type methodology that requires country visits and a more in-depth survey instrument.

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