

CREATING HOPE IN CONFLICT:

A HUMANITARIAN
GRAND CHALLENGE



PHOTO: NAZEER AL-KHATIB / AFP

GRANT AWARD REVIEW

Creating Hope in Conflict: A Humanitarian Grand Challenge

The Research People, June 2020



1. EXECUTIVE SUMMARY

In the face of protracted conflicts and extreme climatic events, the humanitarian system is struggling to keep pace with the growing number of people in need of humanitarian aid. Violent conflict is a key driver of humanitarian needs, with two thirds of those facing acute hunger - 74 million people - in countries and territories affected by conflict and insecurity.¹ Climate change is exacerbating vulnerabilities and driving food crises.² Compliance with international law is declining, with attacks on health workers and facilities restricting access to essential health care, and explosive weapons being used in populated areas where more than 90% of the casualties are civilians.³

In the face of these challenges, in 2018, U.S. Agency for International Development (USAID), the UK Department for International Development (DFID), the Dutch Ministry of Foreign Affairs (DMFA), and Grand Challenges Canada (GCC) initiated *Creating Hope in Conflict: A Humanitarian Grand Challenge* (CHIC). CHIC seeks to identify and support innovative solutions that enable life-saving or life-improving assistance to reach people worst affected by conflict-generated humanitarian crises.

CHIC aims to respond to the needs of those who are hardest-to-reach as a result of conflict-generated humanitarian emergencies, with a particular focus on those living within conflict zones. Innovations funded through CHIC should address key barriers affecting the provision of humanitarian aid across one or more of the four thematic areas: water and sanitation, energy, life-saving information and health care. So far, 52 projects have been funded through CHIC. Forty-six projects received seed funding of up to \$250,000 Canadian dollars (CAD) over 12-24 months, which intended to jump-start projects and allow them to develop proof of concept. Six projects were awarded transition to scale (TTS) funding⁴ with five projects receiving up to \$1,000,000 CAD and one project receiving \$1,700,000 CAD.

GCC commissioned The Research People to conduct a study to assess how well the awarded innovations address the barriers and gaps identified across the four thematic areas, and to provide recommendations on how the process can be strengthened. Each of the 52 funded projects were mapped in relation to the 78 thematic barriers identified in GCC's 2019 Barrier Analysis.⁵ The projects were also mapped against the 12 most significant gaps in emergency WASH, as identified in a 2013 Humanitarian Innovation Fund (HIF) paper⁶ and in relation to the key challenges emerging from ALNAP's 2018 'The State of the Humanitarian System' paper. This allowed The Research People to assess the extent to which barriers and challenges are addressed across the portfolio.

The projects address barriers within four sectors. Most projects address one primary barrier, and a smaller number of projects (10) address multiple barriers within one or two sectors:

- **Healthcare** is the thematic area most addressed within the portfolio. Twenty projects were awarded, addressing 50% of the identified health-related barriers (nine out of 18 barriers in total)

¹ UN OCHA (2019). Global Humanitarian Needs Overview 2020. p12.

² Ibid.

³ UN OCHA (2019). p11.

⁴ Three have been funded and three are in the final stage of approval for funding.

⁵ Grand Challenges Canada (2019). Analysis of Barriers Affecting Innovations in Humanitarian Contexts.

⁶ Bastable, A. and Russell, L. (2013). Gap analysis in emergency water, sanitation and hygiene promotion. London: Humanitarian Innovation Fund; 2013.

These projects include a wide array of innovations spread across all four categories of health-related barriers, including those associated with healthcare infrastructure, healthcare risks and services, the medicine supply chain, and healthcare workers' skills.

- **Lifesaving information:** Thirteen projects with a primary focus on life-saving information were awarded, with particular attention made to two-way communication (eight projects) and content and digital security (five projects). There is an impressive array of technologies and products that focus on solving the technical barriers to better communications. To be most impactful, projects need to also address organizational and sector barriers to improving two-way communication and increasing the quality of decision-making.
- **Energy:** Ten projects address issues related to energy, of which nine focus on the provision of alternative sources of energy, primarily through solar energy (six projects) or battery storage (two projects). Like other innovations in this sector, the projects are relatively early stage and tend to be based on technologies developed outside of the crisis area. The efficacy of energy solutions is likely to be increased by involving affected communities more closely in defining the parameters of household energy solutions.
- **Water and sanitation:** Nine projects were awarded under water and sanitation, which is the least commonly addressed sector. Five projects directly address issues relating to water supply and access, while four address issues of sanitation infrastructure and access to sanitation. Six of the 12 key gaps (50%) identified in HIF's emergency WASH gap analysis are addressed within the portfolio. In particular, the importance of identifying low-tech and sustainable WASH solutions was addressed by seven of nine projects. The largest gap in the HIF paper - 'latrines in locations where no pits are possible (urban, high water-table/flooding)' - was directly addressed by one project in the portfolio. Other key gaps, including final sewage disposal options; hand washing hardware, promotion and sustainability; and community-led total sanitation and sanitation marketing, are not addressed by the portfolio.

Projects were also mapped in relation to 10 key, system-wide challenges drawn from the 2018 SOHS report. Of these, the projects most addressed issues relate to sufficiency, ensuring staff have skills for humanitarian response, and filling key information gaps. Issues of access and coverage were also well addressed, with different innovations seeking to meet the needs of diverse and unique conflict-affected populations, though very few projects address the underlying issues that drive a reduction in coverage and access. A small number of innovations seek to meet protection needs, incorporate the feedback of affected people into decision making, or tailor humanitarian programs to specific contexts.

The final section of the report concludes with a series of recommendations to consider, in order to help guide future investment decisions and/or strengthen the portfolio. These include:

- Increase focus on under-resourced areas of urban sanitation and mental health.
- Provide additional guidance to potential innovators to encourage working with conflict affected communities outside of camp settings, in order to improve access and better meet the needs of affected communities in urban settings.
- Consider the role of innovation in addressing humanitarian barriers and define priority barriers that are within scope for innovation to realistically achieve.
- Provide additional guidance to potential innovators on the prioritization of identified barriers outlined in the CHIC Barriers Analysis report.

- Consider additional pre-application support for solutions being developed by organizations based in conflict areas.
- Consider strengthening engagement of conflict-affected populations in defining their energy problems and developing locally driven solutions.

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3. ABBREVIATIONS AND ACRONYMS

AI	Artificial Intelligence
CAD	Canadian dollars
CHIC	Creating Hope in Conflict: A Humanitarian Grand Challenge
DFID	Department for International Development (UK)
DMFA	Dutch Ministry of Foreign Affairs
FGD	Focus Group Discussion
GCC	Grand Challenges Canada
GWC	Global WASH Cluster
HGC	Humanitarian Grand Challenge
HIF	Humanitarian Innovation Fund
IOT	Internet of Things
OFDA	Office of U.S. Foreign Disaster Assistance
PPE	Personal Protective Equipment
PWD	Person(s) with Disabilities
SOHS	State of the Humanitarian System
TRP	The Research People
TTS	Transition To Scale
USAID	United States Agency for International Development
WASH	Water Sanitation and Hygiene Promotion

4. INTRODUCTION AND BACKGROUND

The humanitarian system is overstretched and struggling to meet increasing needs. Conflicts and extreme climate events meant that a growing number of people required assistance in 2019.⁷ Highly violent conflicts are causing widespread hunger, displacement, death, and destruction around the world while compliance with international law is in decline. At the same time, climate change is increasing people's vulnerability to humanitarian crises and infectious diseases are becoming more prevalent and harder to control, because of conflict, weak health systems, poor water and sanitation, and lack of access to vaccinations.

Against this backdrop, the United States Agency for International Development Office of U.S. Foreign Disaster Assistance (USAID/OFDA), the UK Department for International Development (DFID), the Dutch Ministry of Foreign Affairs (DMFA) and Grand Challenges Canada (GCC) launched *Creating Hope in Conflict: A Humanitarian Grand Challenge (CHIC)*. With armed conflicts increasing in length, complexity, frequency and scope, CHIC responds to the growing numbers of people in need of humanitarian aid living in hard-to-reach, conflict-affected areas.

4.1. HUMANITARIAN GRAND CHALLENGES

The aim of CHIC is to identify, fund and accelerate innovative solutions that enable life-saving or life-improving assistance to reach the people worst affected by conflict-generated humanitarian crises, including those who are particularly vulnerable or who are located in inaccessible areas. CHIC focuses on addressing acute needs in four key areas: (1) safe water and sanitation; (2) energy; (3) life-saving information; and (4) health supplies and services. Proposed innovations must seek to address needs in reaction to one or more of these four areas. Innovations should engage the private sector and involve input from affected communities.

So far, CHIC has launched three funding rounds: the first in February 2018, a second in May 2019 and a third round in April 2020 in response to COVID-19. This report focuses on the first two rounds which have funded 52 projects - 25 in round one, and 27 in round two. Forty-six of these received seed funding, allowing innovators to test new ideas and approaches to humanitarian assistance and to demonstrate proof of concept. Seed projects receive up to \$250,000 Canadian dollars (CAD) over a maximum of 24 months, as well as acceleration and marketing support, mentorship opportunities and partnership brokering. An additional six projects have been approved for Transition to Scale (TTS) funding.⁸ TTS funding should allow teams to refine, test and implement solutions that have achieved proof of concept. TTS innovations can receive up to \$1,000,000 CAD - although one project was awarded \$1,700,000 CAD - plus acceleration support over a maximum of 24 months. Seed grants are intended to jump-start a project, while TTS funding is intended to hone and scale an already-proven project.

CHIC received 615 proposals in round one, and 648 for round two. The selection process included screening against the eligibility criteria set out in the calls for proposals and an 'Innovation Screen' where proposals were scored by reviewers on their relevance to CHIC and the degree to which the idea was

⁷ UN OCHA (2019). Global Humanitarian Overview 2020.

⁸ Three have been funded and three are in the final stage of approval for funding.

innovative. Those who passed this stage were reviewed online by a panel of subject matter experts, private sector leaders, ethics specialists, and conflict-affected community members.⁹

Following the online review, the reviewers convened in Toronto and discussed the highest scoring proposals. The outcome of the meeting was a final ranked list of up to 25 seed proposals recommended for funding, which GCC presented to the Steering Committee for consideration.

4.2. STRUCTURE OF THIS REPORT

The purpose of this work is to provide an overview of the selected portfolios against key barriers to improving humanitarian response. The report begins by setting out the methodology used for the study, including the documents reviewed, and a summary of each of the three key papers used in the mapping exercise.

Section four presents an overview of findings, including a summary of the gaps and barriers that are well addressed within the portfolio and those that remain unaddressed.

Sections five and six present the findings of the mapping exercise. Each begins with a summary of the key barriers and challenges identified in the papers that form the foundation of the mapping exercise. Section five provides detail on the findings of the mapping in relation to each of the four thematic areas (life-saving information, health, energy and water and sanitation). It includes a more in-depth assessment of gaps relating to water and sanitation as set out in the WASH gap analysis.¹⁰

Section six details the findings of the mapping in relation to cross-cutting and systemic challenges identified in the ALNAP SOHS report.¹¹ It considers how the portfolio addresses its aims of reaching conflict-affected populations and overcoming challenges of sufficiency.

The final section of the report concludes and provides a series of recommendations for consideration.

5. METHODOLOGY

GCC commissioned The Research People (TRP) to (1) conduct a study to assess the extent to which innovations awarded address the barriers and gaps identified in the four thematic areas and (2) provide insights and recommendations to consider, in order to help guide future investment decisions. The study aims to inform CHIC staff and its partners in USAID, DFID and DMFA, future review panels, innovators, and donors.

The study sought to address the following four research questions:

- What are the key barriers and gaps for humanitarian response to conflict particularly in relation to the four thematic areas?
- To what extent does the portfolio of CHIC grantees address the key barriers and gaps in responding to conflict?

⁹ Grand Challenges Canada (2019). Application Guide: Initial Innovation Screen Questions

¹⁰ Bastable A, Russell L. Gap analysis in emergency water, sanitation and hygiene promotion. London: Humanitarian Innovation Fund; 2013.

¹¹ ALNAP (2018) The State of the Humanitarian System. ALNAP Study. London: ALNAP/ODI.

- What gaps or barriers within the four thematic areas receive most and least investment?
- What are the areas of opportunity for addressing under or over resourced gaps?

The study was conducted through six phases: inception, document review, mapping, consultations with CHIC staff, analysis and writing, and dissemination. The full framework and methodology guiding the research can be found in Appendix 1 and 2.

5.1. INCEPTION AND DOCUMENT REVIEW

The study began with a kick-off meeting with GCC, during which the context and parameters of the study were clarified. Next, the research team reviewed twelve research papers and five GCC documents to provide a background and context for the study, including key papers on how problems are defined and solutions identified within humanitarian innovation. A list of documents reviewed can be found in the bibliography.

5.2. MAPPING

TRP conducted the portfolio mapping against the gaps and barriers identified in three different studies, identified by GCC: the HGC Barrier Analysis¹², the HIF WASH Gap Analysis¹³ and ALNAP State of the Humanitarian System report.^{14 15} All 52 projects funded so far were mapped based on information in their proposals and (for round 1) project reports submitted to GCC.

The following codes were used to assess the problems that receive the most and least attention through the portfolio. Each project received one of the following three codes for each barrier or challenge identified across the three papers:

Criteria	Explanation
Directly addresses this gap	This barrier or gap is the main problem the project is seeking to address.
Somewhat / indirectly addresses this gap	The project does not directly seek to address this barrier or gap. However, the grantees are indirectly addressing the problem in the way that the project is being implemented, or as a side effect of the project.
Does not address this gap	The project does not relate to this particular problem or gap.

5.3. CONSULTATIONS WITH CHIC STAFF

TRP conducted consultations with three CHIC staff who provided clarifications on the project proposals and reports. This information provided the research team with a better understanding of the funding and guidance on mapping.

¹² Grand Challenges Canada (2019). Analysis of Barriers Affecting Innovations in Humanitarian Contexts.

¹³ Bastable A, Russell L. Gap analysis in emergency water, sanitation and hygiene promotion. London: Humanitarian Innovation Fund; 2013.

¹⁴ ALNAP (2018) The State of the Humanitarian System. ALNAP Study. London: ALNAP/ODI.

¹⁵ An overview of the three studies can be found in Appendix 2.

5.4. LIMITATIONS

In many cases, projects related to multiple thematic areas, gaps or challenges, and the differences between codes (directly addresses, somewhat addresses, or does not address) was not always clear-cut. Grantees had not been asked to identify whether a particular challenge was a primary focus for their innovation - these judgments were made by the research team based on information available in grantees' proposals and reports. Some projects were easy to categorize, while others touched upon different barriers and gaps. The research team have tried to capture these nuances in the analysis, to explain categorizations where possible and to provide examples.

The research relied on self-reported information from each of the grantees about their innovation. The research team cannot verify claims made in these reports about the potential benefits of the innovations. However, as the aim of the exercise was to analyze the alignment of the portfolio with identified barriers and gaps, rather than assess or evaluate the innovations, this was not a major limitation.

6. OVERVIEW OF MAPPING

The CHIC platform aims to fund solutions for people living in areas that are highly insecure and largely inaccessible to international and national aid organizations. Within the broader aim of reaching those worst affected by conflict-generated humanitarian crises, four sector focuses have been chosen to help ensure that the fund addresses critical humanitarian challenges: water and sanitation, energy, life-saving information and health care.

Projects for seed funding have three initial criteria; they must be (a) innovative (b) helping people affected by conflict, and (c) within one of the four sector focusses. Later stages in the application process assess the projects based on their approach to ethics, business plan, and engagement with private sector and affected communities. There is a more detailed process for assessing the TTS grants, and a greater focus on the extent to which the innovation is novel, the likelihood of it obtaining funding elsewhere, and the potential scale and impact.

So far, CHIC has funded 52 projects over two rounds - 25 in Round 1 and 27 in Round 2. Forty-six of these received seed funding, allowing them to test new ideas and approaches to humanitarian assistance and to demonstrate proof of concept. Six have been approved for funding for their transition to scale (TTS). Figure 1 provides an overview of the grants awarded so far.

Across Rounds 1 and 2, CHIC has funded 20 projects in healthcare, 13 in life-saving information, and 10 in the energy sectors. Relatively fewer projects have been funded in the water and sanitation sectors (6 and 3 respectively). The most frequently addressed barriers within each sector are illustrated in Figure 2 and a full discussion is provided in the next section.

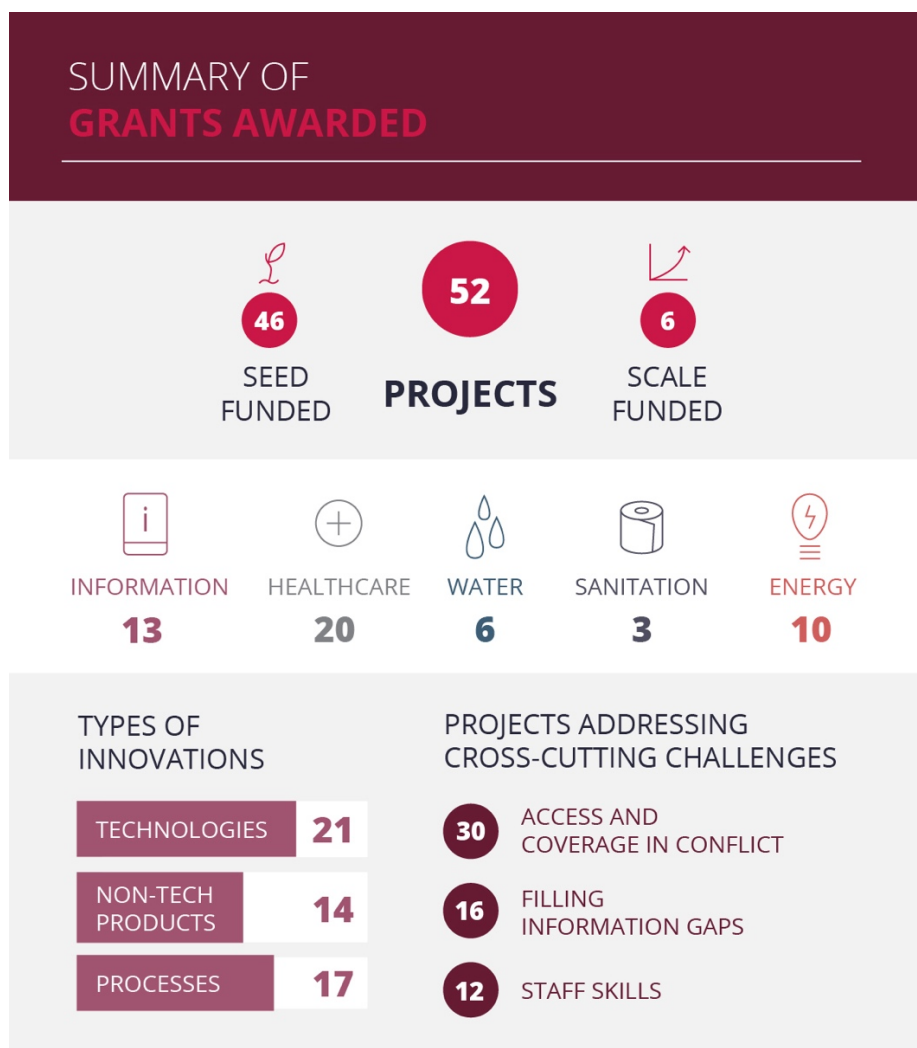


Figure 1: Overview of grants awarded to date.

The TTS portfolio, which aims to support the adoption of tested ideas, funds ideas addressing a relatively similar make-up of gaps and barriers. A carefully chosen set of proven innovations are provided with a large grant and a carefully designed program of support. The projects go through a rigorous selection process designed to identify unique solutions that can be scaled up within humanitarian responses in conflict areas. The TTS portfolio includes six projects so far and is expected to grow over time. It currently includes four projects that address barriers to life-saving information and one each in the energy and health sectors. As with the seed projects, the life-saving information projects are focused on improving two-way communications through better information gathering and analytics.

MOST FREQUENTLY ADDRESSED BARRIERS






	SEED FUNDING	TRANSITION TO SCALE
 INFORMATION	Two way communications	Two way communications
 HEALTHCARE	Healthcare infrastructure	Healthcare risks and services
 WATER	Available water supply	—
 SANITATION	Sanitation infrastructure	—
 ENERGY	Sources of electricity	Sources of electricity

Figure 2: Barriers most addressed in the seed-fund and TTS portfolios.

The CHIC RFP and selected portfolio emphasize the importance of locally-developed solutions and sixteen of the innovations (30%) are led by individuals who self-identify as members of conflict affected communities. Watan Foundation’s energy solution being implemented in Syria, for example, is led by Syrian individuals and their innovation was developed by Syrian engineers. The Community Innovation Hub is led by Sehat Kahani, a women-led network of female doctors in Pakistan. It is important to note that for a variety of reasons, such as for administrative or safety reasons, several locally-based organizations must establish their headquarters outside the affected country; therefore, the organization’s headquarters or physical location is not always a strong indicator of their connection to the affected community. Nevertheless, there remain opportunities to increase funding for solutions directly led by crisis-affected individuals, or seek to further support locally-developed solutions.

At the time of application, thirty-four percent of innovations had secured valuable partnerships with affected communities. For example, ActionAid UK’s innovation is being implemented together with local Women’s Protection Action Groups in Jordan. Johns Hopkins University’s Intelheath and Johns Hopkins University’s MIT Sana mHealth were co-designed with community health workers and local health facility staff. Field Ready’s approach to making items locally means that marginalized groups can be directly involved in co-design and manufacturing.

The portfolio helps to address a range of cross-cutting issues affecting humanitarian responses. These are captured in the mapping in Section 8. The issues most addressed across the portfolio include that the humanitarian system does not have enough resources to meet growing needs, and that there are significant challenges in relation to access. Many projects seek to meet needs more cost effectively than current approaches, through providing services more inexpensively, reducing waste, or building on locally available resources. A smaller group of projects involve new approaches to aid targeting, delivery and tracking, in ways that seek to improve efficiency.

Finally, the fund supports a range of product and process innovations. Like other funds, these tend to be based on technical solutions to humanitarian barriers.¹⁶ These innovations are based on new technologies (21 projects) such as 3D printing or tele-health, on other products (14 projects), such as surgical bags or solar powered devices or on processes (17 projects). The existing portfolio includes the adoption of technologies or products that are already used by society more broadly as well as several genuinely innovative adaptations with specific humanitarian potential.

None of the innovations explicitly describe position- or paradigm-shifting innovations;¹⁷ however, the question remains whether or not truly transformational system-level change can be observed during the lifetime of a two-year (maximum) grant award, particularly when the majority of innovations are using the grant to attempt to prove that a concept works. There are several areas of investment that could represent paradigm-shifting innovations in the future (rather than (necessary) technical improvements to existing humanitarian models). These include investments in two-way communication and in new financing initiatives. However, there are serious barriers to changing the models through which organizations deliver aid and these innovations will require political engagement and specific types of partnership, funding and support.¹⁸

The portfolio and the Grand Bargain

The Grand Bargain (GB), drafted at the 2016 World Humanitarian Summit, is a set of 51 commitments across 10 work streams. The GB is aimed at improving the efficiency and effectiveness of humanitarian aid, addressing the funding gap of almost \$15 billion USD and improving outcomes for affected populations.

The CHIC portfolio addresses commitments in four of the 10 work streams. The first is provision of support and funding tools for local and national responders in order to promote localization of humanitarian aid. Nine projects awarded by CHIC address commitment one under this workstream (support multi-year investment in the institutional capacities) by providing training to health care workers and non-expert staff to improve their response capacities. Several local and national organizations also receive direct funding for innovations (commitment four).

¹⁶ Sandvik, K. B. (2014), 'Humanitarian Innovation, Humanitarian Renewal?'

¹⁷ The dominant "4-Ps" model describes a Position Innovation as a change in the context in which products or services are framed and communicated; a Paradigm Innovation changes the underlying mental models that shape what an organization or sector does. See "Obrecht, A. and T. Warner, A. (2016) 'More than just luck: Innovation in humanitarian action'. HIF/ALNAP Study. London: ALNAP/ODI.

¹⁸ Tom Scott-Smith (2016) Humanitarian neophilia: the 'innovation turn' and its implications, *Third World Quarterly*, 37:12, 2229-2251, DOI: 10.1080/01436597.2016.1176856

The second work stream is about reducing duplication and management costs with periodic functional reviews. This aims to increase the proportion of funding directly reaching affected people. CHIC has addressed commitment one by awarding projects that use technological innovations to improve efficiency and effectiveness of humanitarian aid. The technological innovations facilitate needs assessments (14 projects); enable two-way communication that incorporates feedback mechanisms (one project); and provide sustainable energy (10 projects). To demonstrate alignment with this workstream, projects would need to be able to measure the efficiencies gained.

The third work stream is improvement of joint and impartial needs assessments that provide evidence for humanitarian response. Fourteen projects assist humanitarian organizations to conduct needs assessments that are context-sensitive and that provide current and timely data. However, to help fulfil the commitments, the projects need to be consolidated so that they are used jointly and in a systematic manner by humanitarian organizations.

The final work stream is inclusion of people receiving aid in decision making. Six innovations across the portfolio directly address the need for more inclusion through dialogue and feedback (commitment three), in a way that seeks to influence the performance of the wider humanitarian system. These include projects to facilitate information sharing through support groups and through gathering, translating and analyzing qualitative data.

The six work streams that are not directly addressed by the projects are: greater transparency; increase in the use and coordination of cash-based programming; increase in collaborative humanitarian multi-year planning and funding; reduction of earmarking of donor contributions; harmonizing and simplifying reporting requirements; and enhancing engagement between humanitarian and development actors. The question remains whether it is within the scope of the CHIC innovation fund to address such commitments, since strategic decisions were made to focus on the delivery of emergency humanitarian assistance across the four priority sectors, rather than focus on using the innovation fund to strengthen other areas, such as cash-based programming and collaborative humanitarian multi-year planning and funding.

7. ANALYSIS OF PORTFOLIO BY AREA

The CHIC paper identifies sector-specific barriers for each of the four thematic areas:

- Life-saving information,
- Healthcare services and supply,
- Water and sanitation, and
- Energy

In total, CHIC's barrier analysis paper outlines 78 barriers across the four sectors and the projects funded so far address 28% of these barriers. This 28% reflects a major contribution, as the barriers described in the paper are significant and largely independent of each other. Most projects address one primary barrier, with one project addressing barriers across two sectors (water supply and energy) and 10 projects addressing two or more barriers within the same category.

7.1. LIFE-SAVING INFORMATION



Figure 3: Analysis of how well projects align to the information barriers identified in the HGC Barrier Analysis paper. Barriers directly addressed by more than seven projects receive “most investment.” Barriers directly addressed by fewer than two projects receive “limited investment.”

In relation to life-saving information, the paper outlines 18 barriers divided into the following five broad categories:

- External infrastructure, including access to connectivity and other communication channels
- Content and digital security
- Device availability and use, as well as digital literacy
- Two-way communication with affected people
- Inclusive access, including for women, the elderly and persons with disabilities.

Thirteen projects were awarded which addressed four out of 18 barriers (22%) between them under content and digital security and two-way communication:

Two-way communication is not sufficiently prioritized by humanitarian organizations. Even when it is, many humanitarians have limited time, capacity and resources to improve their communication. Nine projects address two barriers in this area. These projects are developing technological tools that collect data from affected communities in ways that will inform the decisions of humanitarian actors. One of these nine projects facilitate feedback from the community about the quality of the response. Eight additional projects indirectly addressed this theme by collecting information that will enable organizations to act.

Content and digital security: All too often, information is not tailored to the specific needs of communities or is not in a language that affected communities can understand. Five projects addressed two barriers identified in this area. Three of these projects devised technological tools that provide information tailored to a specific end user while two projects developed tools that enable translation of information that is collected in the local language.

It is worth noting that the funding proposals generally frame these as product or service innovations with a focus on solving the technical, rather than the organizational barriers to improving two-way communication and increasing the quality of decision-making. While these projects provide valuable technologies and tools for organizations, there is no guarantee that new approaches will close the feedback loop and translate into meaningful changes in programming, particularly if they are not accompanied by innovations in organizational or cross-organizational processes.¹⁹ Innovators will need to be mindful of where these opportunities exist.

Box 1: Life-saving Information example: The Sentinel Project

The Sentinel Project for Genocide Prevention aims to establish an interactive communication system to engage citizens in monitoring, verifying, and countering the spread of rumors and misinformation. This will help address the barrier to gathering and analyzing information within the category of two-way communication. It will enable enhanced situational awareness by key peacebuilding partners in civil society, government, and the UN peacekeeping forces.

¹⁹ Bessant, John & Rush, Howard & Trifilova, Anna. (2015). Crisis-driven innovation: the case of humanitarian innovation. International Journal of Innovation Management. 19. 1540014. 10.1142/S1363919615400149.

7.2. HEALTH CARE AND SUPPLIES



Figure 4: Analysis of how well projects align to the healthcare barriers identified in the HGC Barrier Analysis paper. Barriers directly addressed by more than seven projects receive “most investment.” Barriers directly addressed by fewer than two projects receive “limited investment.”

In relation to health-care services and supply, the paper outlines 18 barriers divided into four categories:

- Medicine supply, including availability, cost, quality and transportation of medicines
- Healthcare workers, including trust, training and access
- Health facilities, including resourcing and infrastructure
- Healthcare risks, including surveillance and prevention.

Twenty projects were awarded within healthcare. Seventeen of these projects directly addressed nine out of 18 barriers (50%) across all the four categories:

Health care workers: There are not enough health professionals, and professionals often lack high quality training or are not always trusted by the community. **Eight projects** directly addressed the limited number of experienced health care workers by providing training or by training non-expert staff in order to address the shortage.

Health care infrastructure: Health care facilities are under-resourced, vulnerable to attack and have limited access to health care management technology. **Seven projects** directly addressed these barriers through data management tools, modern diagnostic tools, providing medical equipment or protective clothing and providing replacement parts to damaged medical equipment.

Healthcare risks and services: Conflict-affected areas are prone to severe outbreaks of communicable diseases, and there is insufficient attention on non-communicable diseases, mental illnesses and the specific needs of people with disabilities (PwD). **Five projects** directly addressed these barriers through remote diagnostic tools or solutions that specifically address non-communicable diseases, equipment for persons with disabilities, or psycho-social care.

Medicine supply chain: Medicine is too often unavailable, expensive, poor quality and/ or does not reach the intended beneficiaries because of transportation issues. **Three projects** directly address three supply chain barriers by developing new treatment measures, providing medicine and providing transportation for medicine. One project indirectly addresses this area through refrigerators that could be used to transport medicine.

Although the health portfolio is large and includes projects for TTS, there is limited focus on mental health as only one project caters for this. WHO now estimates that one in five people living in areas beset by armed conflict have a mental health condition, such as depression, anxiety, post-traumatic stress disorder, bipolar disorder or schizophrenia – a significant increase from previous estimates.²⁰ Moreover, this is an area with limited humanitarian spending, very few investments from innovation funds, and an area that was identified as one of the ten possible funding focuses in CHIC's initial analysis.²¹

Box 2: Health care and supplies example: Johns Hopkins University mHealth

Johns Hopkins University mHealth is a tablet-based application for diabetes and hypertension care. It addresses barriers to providing health care to people with non-communicable diseases as well as the lack of training for healthcare professionals. The tool will supply uninterrupted information about patients to health care providers to assist in managing their data and treatment.

²⁰ UN OCHA (2019). *Global Humanitarian Overview 2020*. UN OCHA study. Geneva: UN OCHA. p74

²¹ Daar, A. S., Chang, T., Salomon, A., & Singer, P. A. (2018). *Grand challenges in humanitarian aid*. Nature.

7.3. ENERGY

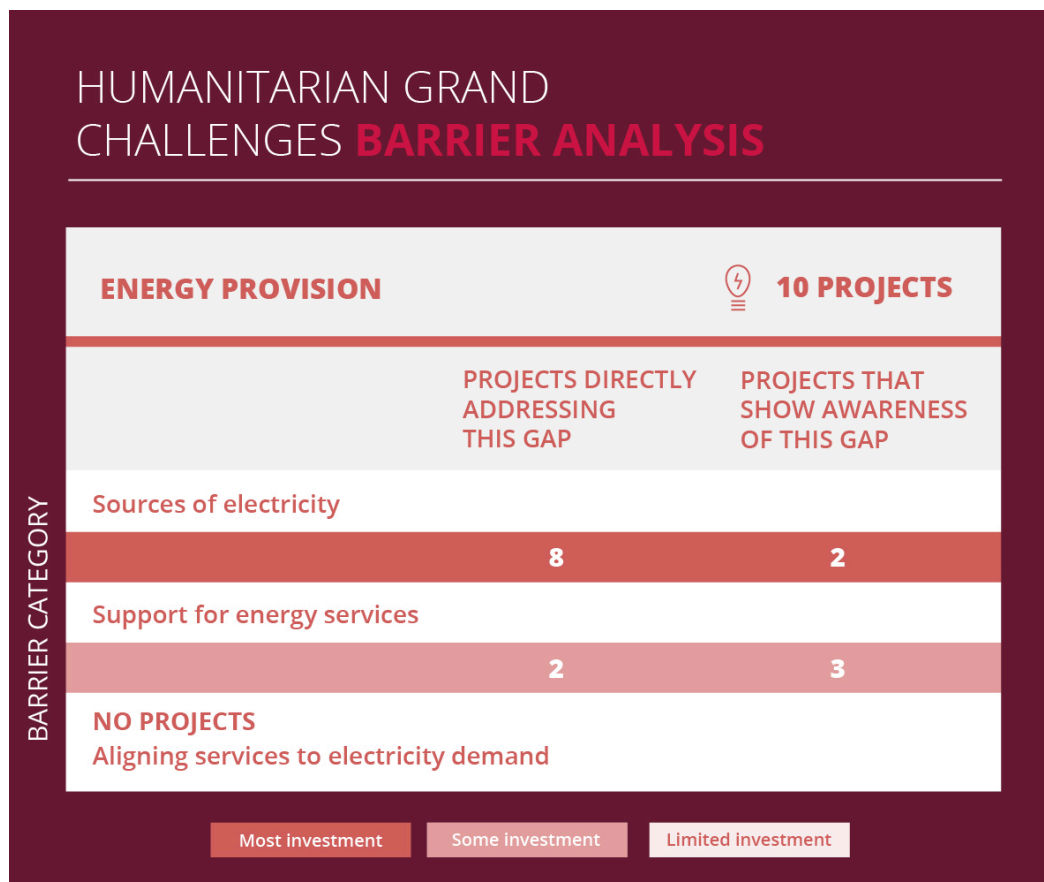


Figure 5: Analysis of how well projects align to the energy barriers identified in the HGC Barrier Analysis paper. Barriers directly addressed by more than seven projects receive “most investment.” Barriers directly addressed by fewer than two projects receive “limited investment.”

Energy is required to run humanitarian operations and affected communities rely on it in their day-to-day lives. Fifteen barriers were highlighted, divided into three broad categories:

- Sources of electricity: including renewable power, solar and battery storage
- Supporting energy services, including training and maintenance
- Aligning electricity to demand.

Ten projects were awarded which addressed six out of the 15 barriers (40%). These fall into two of the three categories:

Sources of electricity: Energy infrastructure is often destroyed or unavailable in conflict and alternative sources of energy are needed. **Eight projects** directly addressed barriers associated with this area by providing alternative sources of energy to humanitarian actors and affected populations through

renewable waste from agricultural processing, battery storage, or solar energy. One additional project indirectly addressed this area.

Supporting energy services: There are limited services for maintenance and waste disposal. **Two projects** directly address this by providing training in order to improve sustainability of their products. **Another three projects** also indirectly address this, for example through supporting local equipment.

The projects described here include a range of initiatives for providing renewable energy sources at the household level as well as training for personnel on how to maintain their products. These innovations are relatively early stage and tend to be based on technologies developed outside of the crisis area. There are several other innovation initiatives (including the GSMA mobile for humanitarian (M4H) innovation fund, the HIF and the Response Innovation Labs) that have funded solutions in this area as well as initiatives to support design of local energy solutions, such as MIT's dLab. This is an area where CHIC's investment priorities could be clarified, and the program could explore opportunities for better engaging conflict-affected populations in defining their energy problems and the parameters for future solutions.

Box 3: Energy example: Sunbuckets

Sunbuckets stores solar energy in portable containers which can be used by communities to cater for their household needs such as cooking, energy to cook, heating, thermal pasteurization of water, and food and grain drying.

7.4. WATER AND SANITATION

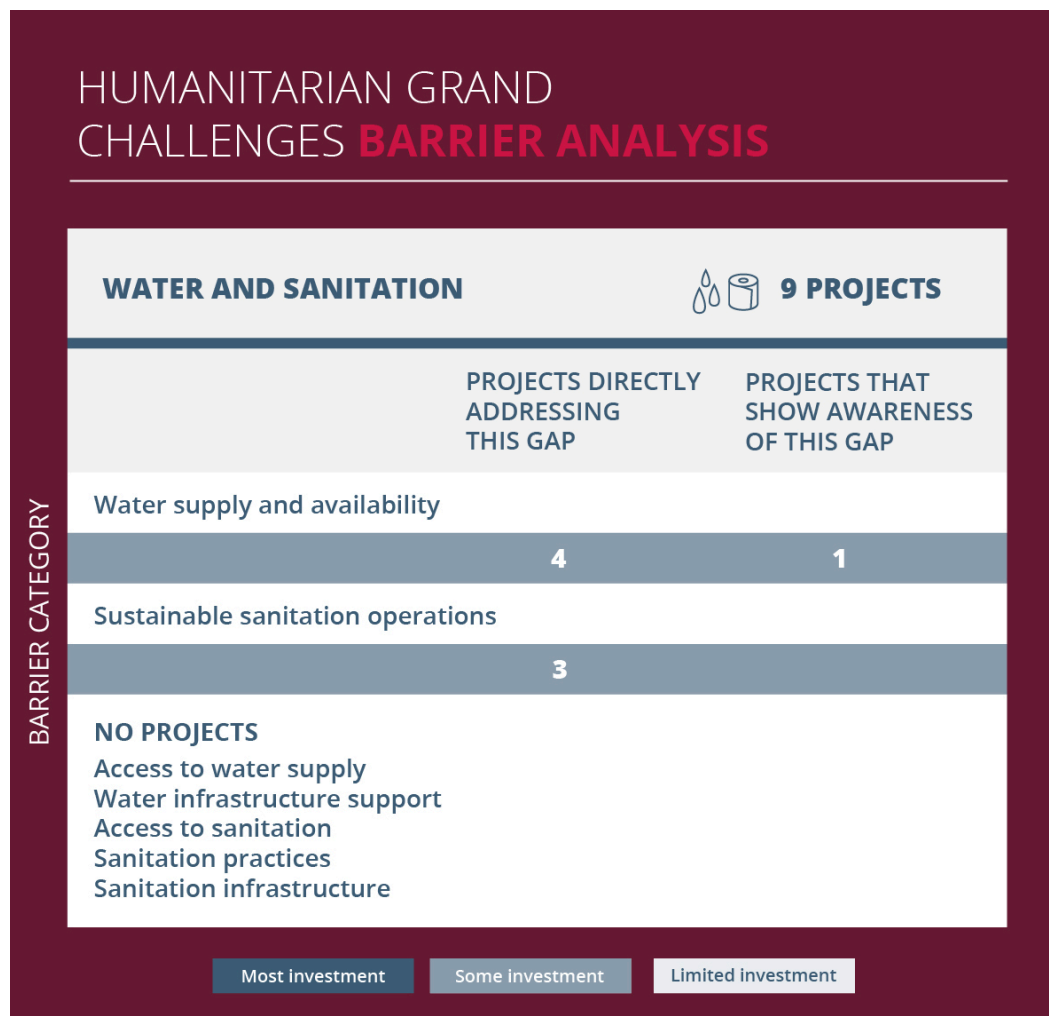


Figure 6: Analysis of how well projects align to the energy barriers identified in the HGC Barrier Analysis paper. Barriers directly addressed by more than seven projects receive “most investment.” Barriers directly addressed by fewer than two projects receive “limited investment.” (Note that two projects awarded under this area did not address any of the barriers identified in the paper)

The paper identifies a range of barriers related to both water and sanitation. There are 13 barriers under three categories that relate to accessing clean drinking water for people living in conflict:

- Water supply and availability, including depletion, pollution or destruction of water sources
- Water supply access, including permanent infrastructure and water trucking
- Water infrastructure support; a lack of funding or political capacity to maintain resources.

In addition, the paper outlines 14 barriers on sanitation, under four broad categories:

- Access to sanitation: there is a disparity in sanitation services for people living in rural and urban areas. Additionally, no provisions are made to ensure safe access to toilets for women, children and PwDs.
- Personal practices: No consideration of cultural and traditional norms in humanitarian programs.
- Sanitation infrastructure: Sewer infrastructure is either in poor condition or destroyed and there is no funding to repair them. There is also no provision made for animal waste.
- Sustainable operations; long term solutions for safe waste and disposal.

Six projects were awarded to address one out of 13 (8%) barriers to clean water. In addition, three projects addressed two out of 14 barriers (14%) to safe sanitation which both fall under the sustainable operations category.

Available water supply: Supply and quality can be hugely problematic; water trucks are often subject to attack and the activity is expensive. Water sources may also be polluted in conflict areas due to various reasons. **Four projects** addressed one barrier - polluted water supplies - by developing water purification systems that process polluted water so that it is safe for human consumption and tools that can determine whether or not available water supply is contaminated.

Safe waste disposal: The paper highlights that most current solutions for safe waste disposal are short term. The three projects all aim to provide longer term solutions for safe waste disposal.

In addition, two projects were awarded under this area that did not address any of the barriers identified. Both projects are better aligned with the life-saving information theme because their innovations generate data that assists humanitarian actors in their response. York University's tool generates data on site specific chlorination instructions for humanitarian field workers while Upande's IoT platform for monitoring key wash indicators allows humanitarian partners to make data-driven decisions based on early warnings. The projects do not directly address provision of safe drinking water, but rather assist other actors who provide safe drinking water through improved information. Although these projects do not directly address the identified barriers, they continue to provide critical services to assist other actors to provide safe drinking water.

7.5. PORTFOLIO IN RELATION TO HIF WASH ANALYSIS

The HIF study describes barriers to water and sanitation in 57 categories, which were then ranked according to the number of times they were mentioned in the feedback and the priority they were given in workshops. Based on this analysis, the paper concludes that there are twelve significant gaps to emergency WASH (see Figure 4), with sanitation barriers listed as most important, and having the greatest potential for innovation.

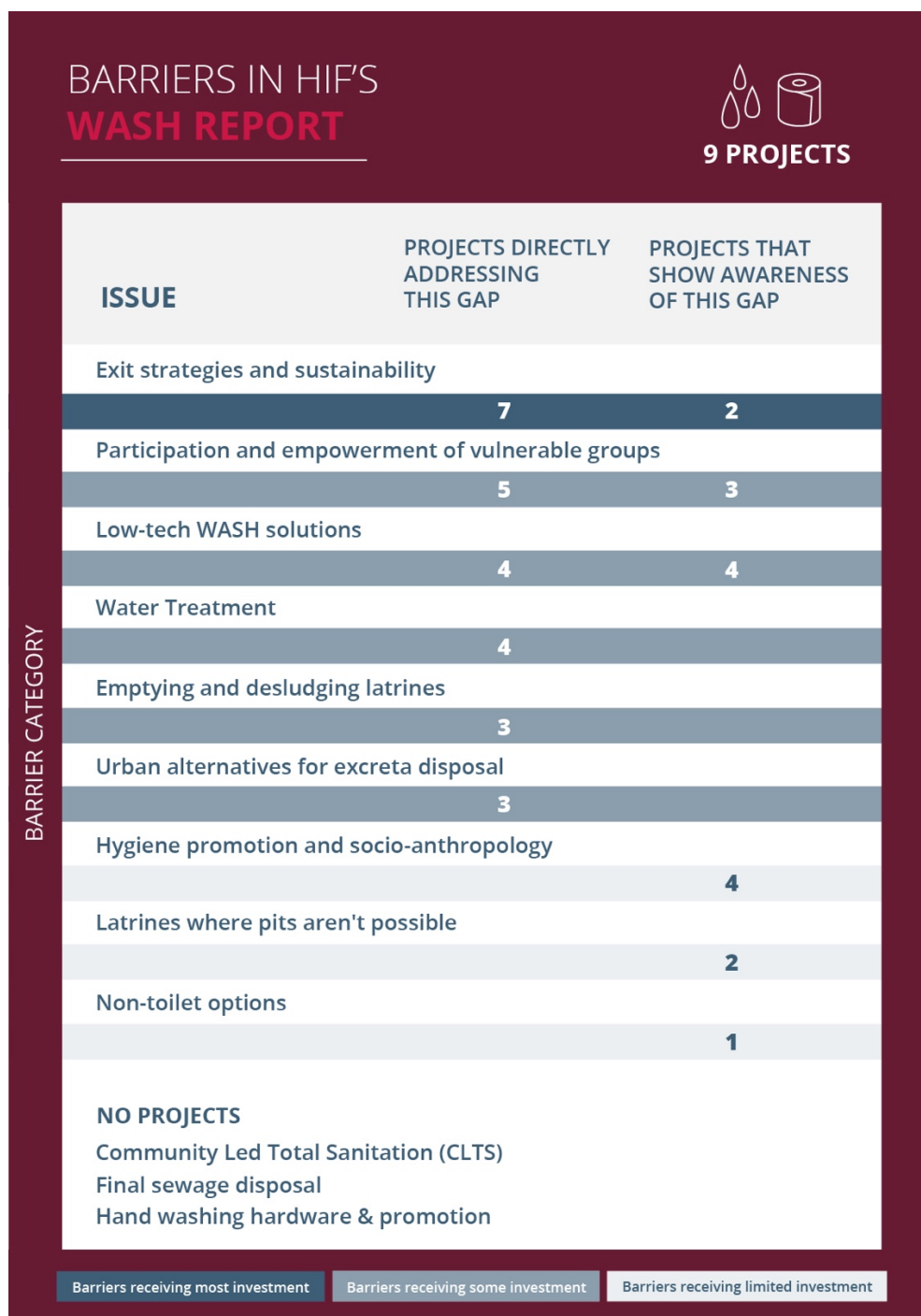


Figure 7: Analysis of how well projects align to the barriers identified in the HIF's WASH Gap Analysis. Barriers directly addressed by seven or more projects receive "most investment." Barriers directly addressed by fewer than two projects receive "limited investment."

The WASH portfolio is smaller than the other sector portfolios and has a slightly greater emphasis on water solutions. Urban sanitation, identified as a major gap in the HIF analysis, was addressed by three projects.²² In addition, there are several innovations that do not align with barriers identified in the paper.

The nine projects in the portfolio address six of the 12 issues covered in this paper. These issues are grouped into three areas: sanitation, hygiene, and water.

Exit strategies and sustainability: The paper emphasizes the need for sustainable projects that can be managed locally once a project's mandate is complete. Seven projects directly addressed this barrier by providing low-tech solutions that were designed for sustainability from the outset.

Community participation and empowerment of vulnerable groups: including monitoring and evaluation (M&E) from the outset, was present in eight of these projects, and there are examples of projects engaging the community in interesting ways. For example, change:WATER Labs will engage affected people to capture feedback on design, usability/usage, aesthetics, and how they develop the servicing models around the latrines.

Low-tech WASH solutions: The paper highlights the need for low-tech WASH solutions that are acceptable and sustainable by local communities. Four projects have directly addressed this gap, for example by providing simple solutions for pastoralists to access data on water point functionality and by simplifying desludging processes through simple septic tank kits.

Water treatment: Four projects directly address the stated need for treating water, for example by using artificial intelligence technology to detect chlorination levels in water to help field workers adapt water treatment practices to the unique local conditions of each field site.

Latrine emptying and desludging: Three projects addressed latrine emptying, which is among the most pressing sanitation issues. The approaches are highly innovative, for example change:WATER Labs are developing a portable evaporative toilet to extend safe, private sanitation to homes with no power or plumbing.

Urban alternatives for excreta disposal: Three projects were designed to facilitate excreta disposal in urban locations, a highly rated gap in the paper. For example, through pre-fabricated foldable membrane septic tank kits that can be set up rapidly and allow separation of solids and liquids.

There were three barriers that were not directly addressed by any project, but where the project design indirectly accounted for the gap. For example, the importance of **understanding context** of hygiene issues, including socio-anthropology issues, was considered by four projects to some degree. Similarly, there are two projects that may allow for **latrines in locations where pits are not possible** (the most highly rated gap identified in the paper). However, the development of **non-toilet options** for use in early response remains a gap. This is noted as significant issues in urban areas that can lead to greater health problems.

Three barriers were not addressed by any project in the portfolio. There were no projects addressing final sewage disposal after desludging and treatment nor any projects supporting Community Led Total Sanitation (CLTS) which is noted as an important area for innovation. Similarly, there were no projects addressing hand washing hardware, promotion and sustainability (including soap) or non-soap options. Given the current global pandemic this is likely to be an important area for consideration in Round 3.

²² Bastable A, Russell L. Gap analysis in emergency water, sanitation and hygiene promotion. London: Humanitarian Innovation Fund; 2013.

Box 5: WASH example: Bremen Overseas Research and Development Association

The prefabricated foldable membrane septic tank kits by the Bremen Overseas Research and Development Association take into consideration that pit latrines need to be replaced or desludged frequently, with heavy logistical and cost burdens. Their tank kits are designed to minimize the time required for set-up, to reduce the need for desludging, and to convert waste into 'biogas' that can be used for cooking or lighting.

8. ANALYSIS OF HOW THE PROGRAM ADDRESSES SYSTEMIC BARRIERS

While the first two papers focus on barriers and gaps in specific sectors that could be addressed through innovation, the SOHS report presents a broader assessment of the status and performance of the humanitarian system. It does not explicitly identify gaps and barriers in the same way as the other papers, but some key areas emerge upon deeper analysis of the paper. Ten key barriers were identified, relating either to 1) SOHS criteria where performance is assessed as having declined or stayed the same since the 2015 SOHS report, and 2) key areas identified by the report as needing improvement. The 10 identified barriers and challenges are:

1. Coverage and access: ensuring that everyone can access humanitarian assistance. This has decreased since 2012.
2. Information gaps: key information gaps include the number of people in need of assistance, data on excess mortality in crisis-affected populations, costs of humanitarian response, and information on the longer-term impacts of aid.
3. Sufficiency: funding is insufficient to meet growing needs.
4. Staff skills: there is a need to ensure staff have appropriate skills for humanitarian response, and the lack of skilled technical staff is a recurrent theme in evaluations.
5. Protection and coherence: respect for international humanitarian law (IHL) is declining and the system is not effective in meeting protection needs.
6. Incorporating views of crisis-affected people into programming: feedback mechanisms are in place, but often do not influence decision-making.
7. Adapting to context: making programs context-specific and adaptable to changes in context, including accounting for mechanisms and capacities already in place.
8. Monitoring: the humanitarian system is extremely poor at monitoring, especially of the outcomes of interventions.
9. Collective action: the system currently demonstrates a lack of effective methods, structures and (often) desire to collaborate.
10. Preventing abuse and exploitation in humanitarian programs: attention to this is increasing but tends to focus on individual efforts rather than systemic commitments.

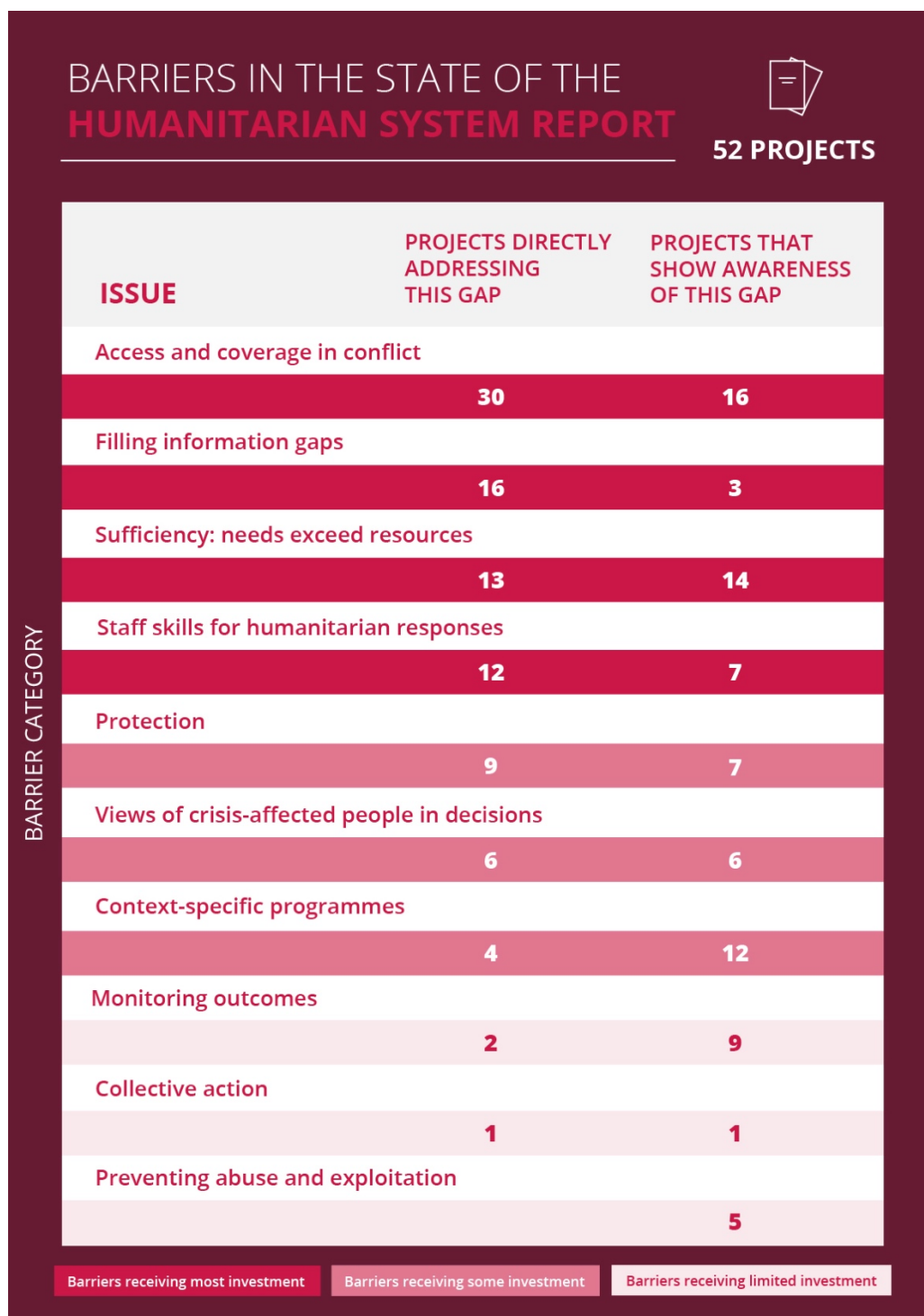


Figure 8: Analysis of projects against the challenges described in the State of the Humanitarian System report. Barriers directly addressed by more than ten projects receive “most investment.” Barriers directly addressed by fewer than three projects receive “limited investment.”

UN OCHA's 2020 global humanitarian overview, which is based on a range of UN reports and OCHA financial tracking service data, draws similar conclusions. In particular, the paper emphasizes increasing conflict and vulnerability to climate change which are driving hunger and preventing access to healthcare and education. The paper also highlights key challenges, such as attacks on healthcare workers, violence against women and girls, and mental healthcare provision.

A more detailed description of the identified barriers against which projects were mapped, including the pages in the SOHS report they relate to, can be found in Appendix 4.

Projects in the portfolio were reviewed in relation to 10 system-wide gaps and challenges identified through the ALNAP's 2018 SOHS report. Many of the challenges identified in the SOHS report are not priority areas for CHIC and were not a key focus for projects. However, the paper helpfully demonstrates how the portfolio relates to a range of system-wide challenges.

8.1. WHICH CHALLENGES RECEIVE THE MOST INVESTMENT?

Four identified challenges – sufficiency, coverage and access, filling information gaps, and staff skills - are well addressed across the portfolio.

8.1.1. Access and coverage

Coverage - ensuring everyone in need can access humanitarian assistance - has steadily worsened since 2012.²³ Coverage is particularly poor in remote and sparsely populated regions, where the risk to humanitarian staff is perceived to be high. Displaced people living outside camps, irregular migrants, and other marginalized groups are often overlooked and aid agencies become less willing to operate in high-risk areas.

Gaps relating to access and coverage are extensively addressed across the portfolio, either directly (30) or indirectly (16). Most projects seek to do this by monitoring needs (including health needs) in conflict zones or by developing products that are more easily deployable in remote or conflict affected areas.

While access and coverage are well addressed in many ways, there are several gaps. Firstly, many innovations are being piloted in relatively stable settings, including refugee camps. These innovations rely on existing access structures and successful negotiations if they want to deploy their innovation in conflict-affected, hard-to-access areas. Second, poor coverage also reflects the exclusion of particular people from accessing humanitarian assistance. Marginalized groups, including minority ethnic and cultural groups and the elderly, are most likely to be overlooked, as well as women and girls, LGBTQI+, stateless people, and people with disabilities. This dimension of coverage receives less attention in the portfolio. The exceptions are those projects seeking to support people with disabilities. Projects that focus on affected people directly reporting their needs may also help identify areas, groups and individuals that are being overlooked.

Few innovations address underlying challenges and dynamics that are worsening coverage. The two innovations most relevant in this area seek to prevent, document and increase accountability for violations of international humanitarian law, including Hala Systems. None of the projects seek to address

²³ ALNAP (2018). The State of the Humanitarian System. ALNAP Study. London: ALNAP/ODI. pages 22, 123

aid agencies' risk aversion (most tend to adopt remote support approaches), and few systematically address the denial of access by governments, though several are being implemented in communities in northern Syria where access has been denied. Addressing these challenges may be beyond the scope of many innovations.

8.1.2. Filling key information gaps

This challenge overlaps with one of CHIC's four thematic areas - 'life-saving information' - and is well addressed across the portfolio. Filling information gaps is the primary focus of around one fifth of projects. This gap receives slightly more attention in the Round 2 projects compared to Round 1.

Typically, projects focus on rapid data generation on immediate needs (including through early warning systems, mapping conflict areas, and nutrition and mortality data) with the aim of informing current responses, rather than information gathering on the longer-term impacts of aid. A smaller number of projects seek to improve information sharing across the humanitarian system, including through automated language and analysis support.

However, few projects relate to the specific information gaps identified by ALNAP - including a lack of information on the number of people in need, excess mortality, and the costs and longer-term impact of humanitarian response.

8.1.3. Sufficiency

The humanitarian system does not have enough resources to meet growing needs and, despite increases in humanitarian funding, the gap between requirements and contributions to UN-coordinated appeals is increasing year-on-year. Few innovations describe issues of sufficiency as their primary focus. However, around half the projects (26) are relevant to sufficiency, with many seeking to meet needs more cost-effectively than current approaches. There are three main ways in which projects in the portfolio address this challenge:

1. Innovations seeking to provide services or products more cost-effectively, potentially helping to reduce the gap between identified needs and resources.
2. Innovations seeking to more effectively target aid in ways that improve efficiency. This includes through better monitoring and tracking, better storage and refrigeration solutions and improved forecasting of needs.
3. Innovations addressing the growing gap between humanitarian needs and available resources by generating or drawing on new revenue sources (two projects).

Box 6: Sufficiency example: NeedsList

NeedsList allows vetted frontline responders to text urgent information, supply, and human resource needs. This addresses sufficiency issues by connecting first responders directly with a wider group of potential supporters, including the private sector. This has potential to shorten transaction chains between donors and frontline responders. In addition, the private sector may have ways to contribute

to life-saving information, supplies or human capital but often does not know that their products or services could be useful.

8.1.4. Ensuring staff have the skills for humanitarian response.

The ALNAP report notes that the need to ensure staff have the skills for humanitarian response is largely overlooked. This gap is well addressed across the portfolio: it is a direct focus for just over one fifth (12) of the projects, predominantly seeking to empower and support local health workers. Nine projects are trying to address this gap in the health field, including by training and/or providing remote support to local health workers, and in some cases by developing product innovations that can be used by non-expert staff. This includes innovations that are connecting community health workers with networks of remote doctors and medical support, or with decision-support technology, as well as innovations that provide training for mental health diagnosis and for administering novel treatments. There are also three projects addressing this gap in other fields.

8.2. AREAS ADDRESSED MODERATELY WELL

There were three areas addressed moderately well: meeting priority protection needs, incorporating views of crisis affected people in decision making and designing programs to be more context specific.

8.2.1. Meeting priority protection needs

Humanitarians are operating in a context of declining respect for IHL and refugee law, and priority protection needs often go unmet. Nine projects directly seek to address these challenges. For example, Hala Systems and the Global Strategy Network seek to protect patients and care providers through early warning for airstrikes on medical facilities, which is also designed to aid accountability efforts.

8.2.2. Incorporating the views of crisis-affected people into decision-making

While the humanitarian system has made 'limited progress' in relation to accountability and participation, there are still few ways in which feedback mechanisms influence programmatic decision-making. Six innovations across the portfolio directly address this challenge in a way that seeks to influence the performance of the wider humanitarian system. These include projects to facilitate information sharing through support groups and through gathering, translating and analyzing qualitative data. However, there is no guarantee that increased communication and consultation will translate into meaningful changes to programming or increased accountability of humanitarian agencies to affected people. These are particularly intractable challenges, limited by entrenched ways of working and by the significant power imbalance between agencies and affected people.

8.2.3. Making programs context-specific (including accounting for existing capacities)

The humanitarian system still operates according to a standard set of activities, structures and procedures and often fails to account for existing capacities, including of the state and of civil society in areas affected by crises. This category considers innovations that seek to support the system to be more adaptable, and to build on and support - rather than replace - local and national capacities. Four projects address this

directly, though another 12 address this indirectly. Projects addressing this can be divided into three sub-categories:

- Those making use of existing capacities in the private sector or civil society,
- Those building on existing health workers' capabilities, and
- Product-innovations designed to be more contextually appropriate.

8.3. WHICH GAPS RECEIVE LEAST INVESTMENT?

Three of the challenges identified through the SOHS report receive little attention in the portfolio: improving monitoring, particularly of outcomes; collective action; and preventing abuse and exploitation in humanitarian programs (PSEA). It is important to note that these were not the focus of the CHIC platform.

9. RECOMMENDATIONS

The report provides an overview of how the funded projects address the major barriers and challenges for improving humanitarian response, particularly in conflict-affected contexts. Based on the gaps identified in the mapping exercise, the following are a list of potential areas to consider when making future investment decisions.

9.1. INCREASE FOCUS ON MENTAL HEALTH

Overall, our analysis highlights that the CHIC funds an array of solutions addressing distinct and wide-ranging barriers. There is an argument for narrowing focus (see below) but within the scope of the current portfolio there is one notable area of under-investment.

While there has been significant investment in healthcare generally, there is limited investment in mental health innovation. OCHA's Global Humanitarian Overview²⁴ emphasizes that as protracted conflicts have become the norm, there is increasing recognition of the mental health and psychosocial needs of populations affected by conflict. There is relatively little humanitarian spending earmarked for mental health services and few innovation funds address these needs.

9.2. CONSIDER THE ROLE OF INNOVATION IN ADDRESSING HUMANITARIAN CHALLENGES AND DEFINE PRIORITY BARRIERS THAT ARE WITHIN SCOPE OF WHAT INNOVATION CAN REALISTICALLY ACHIEVE.

There are a growing number of studies addressing key barriers and challenges for improving humanitarian response. However, there is very little research on the types of problems that can be addressed by different forms of innovation funding and support. For example, what type of innovation process could address (if at all) the sector-wide challenges that ALNAP's State of the Humanitarian System report describes? And what is the role of a Grand Challenge program within that? CHIC is well positioned to articulate and reflect on some of these questions, which would be useful for donors and other funds. The

²⁴ UN OCHA (2019). *Global Humanitarian Overview 2020*. UN OCHA study. Geneva: UN OCHA.

process would also help CHIC define more clearly the types of barriers that it aims to address, and the types of solutions that it should fund in order to do so.

9.3. PROVIDE ADDITIONAL GUIDANCE TO POTENTIAL INNOVATORS ON THE PRIORITIZATION OF IDENTIFIED BARRIERS OUTLINED IN THE CHIC BARRIERS ANALYSIS REPORT.

CHIC requires innovators to address problems within the four sectors, but it does not identify priority areas for doing so. Although the *GCC Analysis of Barriers Affecting Innovations in Humanitarian Contexts* provides an overview of barriers across the four sectors, it does not provide an indication of which of these barriers are most significant or highest priorities within conflict contexts. Future versions of this document should provide insights into priority issues (including within particular conflict settings).

9.4. PROVIDE ADDITIONAL GUIDANCE FOR POTENTIAL INNOVATORS TO ENCOURAGE WORKING WITH CONFLICT AFFECTED COMMUNITIES OUTSIDE OF CAMP SETTINGS, IN ORDER TO IMPROVE ACCESS AND BETTER MEET THE NEEDS OF AFFECTED COMMUNITIES IN HARD-TO-REACH AND URBAN SETTINGS.

Most projects are being implemented within refugee settings; there is less focus on the needs of displaced people living outside camps, or of communities isolated or trapped by conflict, especially where there is no existing humanitarian access. Relatedly, though many projects focus on meeting the needs of displaced people, fewer focus on the specific needs of people living outside of camps, including for example the significant gaps in urban sanitation provision for displaced people. Helping to extend access to aid to areas where it does not already exist will require innovators to consider how their projects can be implemented in areas without strong humanitarian structures and to include plans to test projects in hard-to-access areas.

9.5. CONSIDER ADDITIONAL SUPPORT FOR SOLUTIONS BEING DEVELOPED BY ORGANIZATIONS BASED IN CONFLICT AREAS

The CHIC RFP and selected portfolio emphasize the importance of locally-developed solutions and sixteen of the innovations (30%) are led by individuals who self-identify as members of conflict affected communities. Nevertheless, there remain opportunities to increase funding for solutions directly led by individuals living in crisis-affected communities. This could include identifying and supporting local organizations pre-application to articulate their problem statements and innovation ideas.

9.6 CONSIDER STRENGTHENING ENGAGEMENT OF CONFLICT-AFFECTED POPULATIONS IN DEFINING THEIR ENERGY PROBLEMS AND LOCALLY DRIVEN SOLUTIONS.

The projects described in the energy portfolio include a range of initiatives for providing renewable energy sources at the household level as well as training for personnel on how to maintain their products. These innovations are relatively early stage and tend to be based on technologies developed outside of the crisis area. There are several other innovation initiatives (including the GSMA mobile for humanitarian (M4H) innovation fund, the HIF and the Response Innovation Labs) that have funded solutions in this area as well as initiatives to support the design of local energy solutions, such as MIT's dLab.

This is an area where CHIC's investment priorities could be clarified. There are likely to be opportunities for better engaging conflict-affected populations in defining their energy problems and the parameters

for future solutions. One example of a CHIC innovator already doing this is the Nuru Energy team based in DRC.

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GCC DOCUMENTS

- Application Guide: Initial Innovation Screen Questions
- Frequently asked questions about the grant
- Semi-annual Progress Update (template)
- Request for proposals - Round 1
- Request for proposals - Round 2

APPENDIX 1. OVERVIEW OF RESEARCH STUDIES

HGC Barrier Analysis

The first mapping used GCC's 2019 "Analysis of Barriers Affecting Innovation in Humanitarian Contexts". This paper was chosen because it informed the focus of the second request for proposals for the CHIC. The paper was developed in March-April 2019 through semi-structured interviews with humanitarian experts who have expertise across the four thematic areas, and supplemented by a desk review that explored the barriers and challenges in providing humanitarian aid. The paper outlines a total of 78 barriers specific to the thematic areas and describes how they affect humanitarian service delivery and prevent access. The barriers identified are wide-ranging and span global, regional, national and/or local levels. The paper does not provide guidance on how solutions should be developed to address the barriers identified. For this portfolio review, projects were mapped against the 78 theme-specific barriers. A full list of these barriers can be found in Appendix 3. Projects were not mapped against the 14 contextual and political challenges identified, which are instead assessed through mapping based on ALNAP's SOHS report.

HIF Gap Analysis

The second mapping is based on the 2013 HIF Gap Analysis in Emergency Water, Sanitation and Hygiene Promotion, published in July 2013. This paper was chosen because it focuses on the major challenges that require innovative solutions in humanitarian Water Sanitation and Hygiene Promotion (WASH). The research was led by the head of WASH at Oxfam GB, and involved consultations with a total of 909 people across 40 countries. The paper draws on six research components collected over six months. This includes a review of relevant literature produced over the preceding five years; facilitated workshop discussions with WASH practitioners working at the country and sub-national level in 12 countries; an online survey of humanitarian WASH practitioners; two facilitated sessions with Global WASH Cluster (GWC) meetings; a consultation with five major donor organizations supporting humanitarian WASH programming and policy; and focus group discussions (FGDs) at the country and sub-country level. Our mapping focused on the top 12 issues in emergency WASH raised as most significant by all stakeholders (out of a total of 26 issues).

ALNAP State of the Humanitarian System report

The third mapping was conducted in relation to ALNAP's 2018 State of the Humanitarian System (SOHS) report. The SOHS is an independent study assessing the performance of the humanitarian system every three years. The 2018 edition covers 2015-2017. It is based on extensive data collection, including a literature review and case studies, interviews, questionnaires and surveys covering a range of contexts. It is a globally-oriented study assessing trends across different contexts, and conflict-affected areas represent a major focus of the report, given the concentration of humanitarian needs in these settings.

Barriers and gaps drawn from the 2018 SOHS report include SOHS performance criteria that have seen a decline or no change since the 2015 report (sufficiency, coverage and coherence) and key areas identified

by the report as needing improvement. A full list of barriers drawn from the SOHS report can be found in Appendix 4.

Barrier, gap or challenge?

The language of barriers and gaps reflects the language used in the three main papers that informed the mapping.

Barriers and gaps are primarily discussed in relation to the HGC and HIF papers. The HGC barrier analysis identifies two types of barriers: firstly, sector-specific barriers which could be addressed through CHIC-funded innovations, including equipment and supply shortages or high costs of maintaining infrastructure; and cross-cutting contextual barriers, including larger political and structural barriers, which are unlikely to be solved by humanitarian organizations alone or by a single innovation - rather, they are barriers that innovators would need to take into account in their projects.

The HIF paper sought to identify gaps and spaces for innovation in emergency WASH, and focused specifically on challenges that can be solved by tangible innovation. Gaps are challenges with space for innovation. They are also described as issues or challenges.

The ALNAP paper does not talk about barriers and gaps in the same way. The paper is based on a much larger and wider-ranging study and presents an assessment of the performance of the humanitarian system according to the SOHS performance criteria. We drew out a set of barriers or challenges based on a close reading of the paper, including a) criteria where there has been no progress or where performance has declined and b) areas identified by the study as key areas of improvement. Because of the nature of this study, these are largely system-wide or structural barriers and issues affecting the delivery of aid.

APPENDIX 2: RESEARCH FRAMEWORK

The research was guided by the following questions and sub-questions:

Research questions	Sub-questions
1. What are the key barriers and gaps for humanitarian response to conflict particularly in relation to the four thematic areas?	<p>1.1. What are the specific challenges and gaps relating to safe water and sanitation; energy; life-saving information and health products and services.</p> <p>1.2. What are the systemic barriers and gaps identified in the three papers?</p> <p>1.3. To what extent are these challenges and gaps location specific vs. generalizable across conflicts</p> <p>1.4. What - if anything - is argued about how solutions should be developed to address these gaps (including the appropriateness of innovation funding for different types of gap/barrier)</p>
2. To what extent does the portfolio of CHIC grantees address the key barriers and gaps in responding to conflict?	<p>2.1. Which of the barriers or gaps discussed in the HGC Barrier Analysis does each project address?</p> <p>2.2. Which of the barriers or gaps discussed in the 2018 SOHS does each project address?</p> <p>2.3. Which of the barriers or gaps discussed in the HIF's Gap Analysis documents does each project address?</p>
3. What gaps or barriers within the four thematic areas receive most and least investment (and is that appropriate compared to unmet need, factoring in where we can add most value)?	<p>3.1. What type of gaps/barriers (eg. product, operational, systematic) receive most and least funding?</p> <p>3.2. What types of gaps/barriers receive investment for pilot vs scale up funding?</p> <p>3.3 What types of gaps/barriers receive most and least funding in the four sectors?</p> <p>3.4. What are the other patterns or themes in the investment portfolio?</p> <p>3.5 Are there any sectors where it is logical for CHIC to focus more or less? Are there certain sectors where CHIC - consider: if we can add adds specific value that in certain sectors, if certain sectors are neglected by other comparable funders (GSMA, Elrha)</p>
4. What are the areas of opportunity for addressing under or over resourced gaps?	<p>4.1. How can CHIC adapt its approach to calling for proposals to address these gaps?</p> <p>4.2. How can CHIC adapt its approach to ranking and selecting proposals to address these gaps?</p> <p>4.3 Should CHIC continue to focus on these four areas? What else should CHIC consider?</p>

APPENDIX 3. ANALYSIS OF BARRIERS AFFECTING INNOVATIONS IN HUMANITARIAN CONTEXTS

The tables below provide a list of barriers for each thematic area mentioned in the paper. The tables include examples of projects that directly and indirectly address the barriers based on the analysis provided on pages 16-19.

Category	Barriers and projects that directly address them	Projects that indirectly address the barriers ²⁵	Barriers that are not addressed
Lifesaving information			
External infrastructure			(1) Internet connectivity (2) Power for phones (3) Other communication channels (4) Secure digital identity (5) Digital security and harm
Content and digital security	(6) Targeted content – implemented by Hala Systems, ActionAid UK and Norwegian Refugee Council (8) Appropriate language – implemented by Translators without Borders and Kobo	(6) Murdoch Children’s Research Institute	(7) Appropriate content (9) Obtained and used data permissions.
Device availability and use			(10) Access to a phone, (11) Affordability of phones (12) Digital literacy.
Two-way communication	(13) Support for two-way communication – implemented by Hala systems, Humanitarian OpenStreet Map, Humanity Data Systems, Global Strategy Network; (14) Limited capacity to analyse and use data – implemented by NeedsList, Avigo Health, Elva Community Engagement, Harvard Humanitarian Initiative, and	(13) Support for two-way communication - Implemented by Fundación Acción Contra el Hambre and Murdoch Children’s Research Institute (14) Limited capacity to analyse and use data –	(15) Limited capacity to act on data (16) funding frustrations with no/slow response

²⁵ This column represents projects that were not awarded under this thematic area but nevertheless addressed the barriers.

	The Sentinel Project for Genocide Prevention.	implemented by Johns Hopkins University's MIT Sana m-health, Omni-Vis, Action Against Hunger, York University, Upande and Body Surface Translations	
Access			(17) Gender access and (18) disadvantaged communities' access
Healthcare services and supplies			
Category	Barriers and projects that directly address them	Projects that indirectly address the barriers²⁶	Barriers that are not addressed
Medicine supply	(1) Lack of research into infectious disease treatment – implemented by Griffith University (3) Medicine is unavailable – implemented by The Mentor Initiative and UOSSM	(6) Local transportation conditions for medicines – Solar Freeze	(2) Medicine lacks regulatory approval (4) Poor quality of medicine supply, (5) Inability to pay for costly medicine, and (7) Verifying transportation conditions for medicines and vaccines.
Health-care workers	(8) Healthcare worker training - implemented by Johns Hopkins University's Intelhealth, Al Seeraj, Johns Hopkins University's MIT Sana mHealth, Griffith University, The Board Of Trustees Of The Leland Stanford Junior University, Comprehensive Community-Based Rehabilitation in Tanzania, Community Innovation Hub and Bridge to Health Medical and Dental USA		(9) Insufficient numbers of healthcare workers (10) Attacks on healthcare workers (11) Distrust of healthcare workers.

²⁶ This column represents projects that were not awarded under this thematic area but nevertheless addressed the barriers.

Healthcare facilities	(13) Limited healthcare management technology - implemented by Johns Hopkins University MIT Sana mHealth, Body Surface Translations, Bridge to Health Medical and Dental USA and Pragmatic Innovation Inc and (15)lack of special equipment for infectious diseases implemented by Surgi Box, Ecole Polytechnique Fédérale de Lausanne and Field Ready		(12) Limited healthcare physical infrastructure (14) Limited investment in infectious diseases
Healthcare risks	(16) Risk of large and severe outbreaks overwhelming capacity – implemented by Iristick (18) Specific groups and conditions go untreated – implemented by CCBRT, SUNY Korea, Community Innovation Hub and The Board of Trustees of The Leland Stanford Junior University		(17) Service approach not standardized
Water and sanitation			
Category	Barriers and projects that directly address them	Projects that indirectly address the barriers²⁷	Barriers that are not addressed
Water supply and availability	(1) Polluted water supply – implemented by Yemen Relief and Reconstruction Foundation, Energetically PBC, Omni Vis and World Vision		(2) Reduced water supply, (3) Depleted water aquifers (4) Expensive to pump from low water table
Water supply access			(5) Water infrastructure in poor condition (6) Water infrastructure vulnerable to attack (7) Expensive water trucking, (8) Water trucks vulnerable to attack, (9) Local access to water is a long

²⁷ This column represents projects that were not awarded under this thematic area but nevertheless addressed the barriers.

			distance away (10) Local access to water is dangerous.
Water infrastructure support			(11) Lack of national political capacity for infrastructure (12) Lack of funding/revenue for infrastructure and (13) Lack of political capacity for infrastructure
Access to sanitation			(1) Widely varying quality and access to sanitation based on context (2) Safe access to toilets for women (3) Safe access to toilets for children (4) Safe access to toilets for those with disabilities.
Personal practices			(5) Cultural barriers to sanitation practices (6) Access to hand washing resources.
Sanitation infrastructure			(7) Sewer infrastructure in poor condition, (8) Sewer infrastructure destroyed in conflict (9) Limited sanitation infrastructure investment and (10) Animal waste disposal and use
Sustainable operations	(11) Sustainable toilet and facility maintenance – implemented by change:WATER Labs (13) Safe waste disposal implemented by change:WATER Labs, Bremen Overseas Research and Development Association and Texas A&M University - San Antonio		(12) Sustainable waste disposal services (14) Valuable secondary uses of waste
Energy			
Category	Barriers and projects that directly address them	Projects that indirectly address	Barriers that are not addressed

		the barriers ²⁸	
Sources of electricity	(1) Supply of renewable power from waste – implemented by Mandulis Energy (2) Supply of solar renewable power – implemented by Rainmaker Organization for Sustainable Development, Sun Buckets, Prado Power Limited, Solar Freeze, Kivu Green (3) Battery storage for renewable power – implemented by Watan Foundation and Power Blox,	(2) Yemen Relief and Reconstruction Foundation and Energetically PBC	(4) Fuel supplies are subject to attack in conflict (5) Costly diesel generated power, (6) Power plants subject to attack in conflict (7) Electric transmission subject to attack.
Supporting energy services	(9) Maintenance of local equipment – implemented by Rain-maker Organization for Sustainable Development and Solar Freeze	(8) Supporting local equipment – implemented by Energy Peace Partners ²⁹ (9) Maintenance of local equipment – implemented by Yemen Relief and Reconstruction Foundation and Energetically PBC	(8) Sale and setup of local equipment, (10) Access to business opportunities for women and disadvantaged groups (11) Bio waste disposal and secondary use and (12) Battery and dangerous waste disposal.
Aligning to electricity demand			(13) Difficult to predict level and type of demand (14) Difficult to prioritize types of use (15) Difficult to operate with inconsistent power supply

²⁸ This column represents projects that were not awarded under this thematic area but nevertheless addressed the barriers.

²⁹ This project was awarded under this thematic area but indirectly addressed it.

APPENDIX 4. SOHS 2018 - IDENTIFIED GAPS AND CHALLENGES

Challenge or gap identified	Explanation
Funding is insufficient to meet growing needs (sufficiency)	The number of people in need of humanitarian assistance is increasing, driven particularly by complex crises and increased displacement. Humanitarian funding is increasing too, but it is not keeping pace with increased need. As a result, the system does not have sufficient resources to meet needs (pages 24, 80, 112).
Coverage and access are declining	<p>Coverage (reaching everyone in need) has been getting steadily worse since 2012, especially in situations of conflict. This is partly because of governments and non-state armed groups denying or hindering access, including using bureaucratic delaying tactics to prevent aid reaching people in need. However, there are also signs that humanitarians have become less willing to operate in areas deemed to be high risk (pages 121, 123).³⁰ Humanitarian organizations are “<i>overly risk-averse and insufficiently prepared to move rapidly from one location to another</i>” (p23).</p> <p>In the 2015-17 period covered by the SOHS report, coverage was particularly poor in remote regions, places where the risk to humanitarian staff was perceived to be high, and in areas under siege, and for displaced people living outside camps³¹ and irregular migrants (page 120). Marginalized groups (especially minority ethnic and cultural groups and the elderly) were most likely to be overlooked. In some cases, the system has largely overlooked crises because they take place in countries where governments prevent access (p123). Areas with a combination of poor logistics and high perceived risk to aid workers were particularly under-served relative to needs, as well as areas where governments prevented access and areas controlled by non-state armed groups (NSAGs) (p125).</p>
Weaknesses in meeting priority protection needs	<p>Humanitarians are operating in a context of declining respect for International Humanitarian Law (IHL) and refugee law; and there is a sense that it is getting harder to act in coherence with humanitarian principles (pages 26, 213). The period covered by the report saw numerous flagrant breaches of IHL and refugee law (p214).</p> <p>The system is not effective in meeting protection needs, which often go unmet (p24). There are weaknesses in both identifying and responding to priority needs for protection (p138). The system is also poor in responding to the specific vulnerabilities of particular groups, including the elderly or disabled.</p>

³⁰ Research quoted in this report has shown that “‘*Considerably fewer humanitarian organizations ... respond to highly violent, conflict-driven emergencies, irrespective of funding available and the needs of the population*’ (Stoddard et al., 2016: 7), and that, within countries suffering from conflict, the majority of agencies tend to avoid areas perceived as being more dangerous – often those areas under the control of non-state armed groups.” (p126)

³¹ The report describes a “widespread failure to provide assistance to IDPs living outside camps” (p126).

Filling key information gaps	There are weaknesses in the collection of information in a number of key areas. This includes the number of people in need of humanitarian assistance, with figures for people in need often extrapolated from weak or outdated population data; data on excess mortality in a population affected by crisis; the costs of humanitarian response with different organizations using different approach to account for funds (see pages 21, 66); and the longer term impact of humanitarian aid on lives, societies and economies, whether positive or negative - the information that currently exists is largely anecdotal (see pages 66, 273). 'Impact' is poorly understood and there is little hard data on the impact of humanitarian responses on populations or across time. (p273).
Improving monitoring, particularly monitoring of the outcomes of humanitarian interventions	<p>The system is extremely poor at monitoring, particularly of the outcomes of interventions (p21, 143). There is often a focus on outputs rather than outcomes. Some outcomes are hard to measure - for example collecting epidemiological data (such as disease morbidity or mortality) on a population requires a monitoring system and long-term commitment, and is resource-intensive (p182).</p> <p>As a result of poor monitoring, aid agencies can fail to understand how the needs and priorities of affected people are changing over time (p143). This contributes to challenges in switching from emergency response to protracted relief activities.</p>
Ensuring staff have the skills for humanitarian responses	There is a need to ensure staff have appropriate skills for humanitarian response. The lack of skilled technical staff, particularly at field level, is a recurrent theme in evaluations (p149). Rapid turnover of staff is a constraint to effective response, and there were concerns about the lack of skills in key areas such as WASH and urban response (p196).
Incorporating the views and feedback of crisis-affected people into program design and decision-making	While there is increasing consultation of crisis-affected people, this rarely results in major changes and is seen increasingly as a 'box-ticking exercise' (pages 155, 156). Feedback mechanisms are in place but do not influence decision making (p24).
Making program more context-specific and adaptable to changes in context; including accounting for mechanisms and capacities already in place	The system still operates largely according to a standard set of activities, structures and procedures. Yet there has been an increase in non-standard emergencies, including in urban contexts, middle- and high-income countries and in response to new and unexpected crises. <i>"The model also fails to take into account the capacities of the state and of civil society affected by crises, and so allow the system to 'fill gaps' and work in support of mechanisms that are already in place."</i> p23. Progress on enhancing the role of local and national NGOs has been limited (p249).
Preventing abuse and exploitation in humanitarian programs	This is an important failing in the area of accountability. Attention to PSEA is increasing but has tended to rest on individual efforts rather than systemic commitments or joined-up activities. Few evaluations or interviewees considered this issue (p21, 165).

Collective action: methods and structures for collaboration	<p>The system currently demonstrates a lack of effective methods, structures and (often) desire to collaborate. The system as a whole is “consistently less than the sum of its parts” (p23). There are areas where individual agencies have made significant advances, such as accountability, protection against sexual exploitation and abuse (PSEA), innovation, procurement, working with civil society and many more, but this has not translated into improvements at the level of the system as a whole.</p>
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