THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Brunel University London

Emerging Technologies in Humanitarian Management

Event Pack | 30 November 2022

09:00 – 14:30

Supported by the LSE Knowledge Exchange and Impact fund

About this event pack

This event pack collates the work being done by participants and contains logistical information, background, and other relevant details.

Contents

Venue, location and timings

The event will be held in the same building as the LSE Library: British Library of Political and Economic Science (also called the Lionel Robbins Building)

10 Portugal Street, London WC2A 2HD, 4th Floor (PhD Academy), room number LRB 4.02.

Google Map link: https://goo.gl/maps/dzfGkCddpKbj8AKy6.

Getting to LSE

You can find more information on travelling to LSE on this link: https://www.lse.ac.uk/lse-information/travelling-to-lse.

Getting to the room

As you enter the library, take the second door to your left and the then the lift to the 4th Floor (PhD Academy). Enter through the two successive doors on your right and you will see a glass fronted room. This is LRB 4.02 where we will have the meeting. This route will be not be key card restricted and you should be able to move freely. The security at the Library have been also been informed and should you be stopped, please mention the event.

Lunch venue

For lunch we will be heading to the Staff Dining Room (SDR). This is very short walk from our meeting location. This is located in the Old Building (OLD). We will use the Clare Market entrance as marked on the map below.

Houghton Street, London WC2A 2AE, 5th Floor.

Google Map link: https://goo.gl/maps/rMHR4dccBJxiRgNdA.

Timings

The event is scheduled from 09:00 – 14:30 (inclusive of lunch). Post 14:30 we can carry forward any remaining conversations to the adjacent bar or common area. Any purchases made at the bar are not covered by the event.

LSE campus map

Below is a LSE campus map with the meeting and lunch locations marked. You can also download a campus map here.

Programme

09:00 – 09:10 | **Welcome**

Anulekha Nandi, LSE

09:10 – 09:30 | **FCDO perspective on forecasting and humanitarian response**

Max Brodie, Team Lead - Early Warning Monitoring, Alerting, and Risk Analysis, Foreign, Commonwealth and Development Office (FCDO)

09:30 – 10:15 | **Session 1: Developing humanitarian technologies: role of technical and contextual knowledge**
Aim: Understanding the role of technical and contextual knowledge in developing humanitarian technologies; challenges around access to relevant knowledge, resources, and data; and potential ways to overcome them.

Derek Groen, Reader in Computer Science, Brunel University (Chair)
Sofia Kyriazi, Artificial Intelligence Engineer, UNHCR Innovation Service
Bo Schwartz Madsen, Data Scientist, Danish Refugee Council
Douglas Leasure, Senior Researcher and Data Scientist, Oxford Leverhulme Centre for Demographic Science
Emrys Schoemaker, Research Director, Caribou Digital

10:15 – 11:00 am | **Session 2: Implementing humanitarian technologies: organisational and contextual fit**
Aim: As humanitarian technologies are developed away from the local context, their efficiency and effectiveness depend upon downstream organisational capabilities, relevance for the context, and the reliability to serve as a basis for decision-making and resources mobilisation. The aim of this session is to understand the factors behind technological-organisational-contextual fit.

Robert Trigwell, Senior DTM (Displacement Tracking Matrix) Coordination Officer, International Organisation for Migration (IOM) (Chair)
William Low, Project Lead – Migration and Displacement Initiative, Save the Children
Mai Seida, Global Programmes Officer, Royal College of Surgeons of England
Shirin Madon, Associate Professor - International Development and Information Systems and Innovation, LSE
Mahdi Zaki, Country Research Manager – Afghanistan and ***Nicola Bailey,*** Senior Research Manager, BBC Media Action

11:00 – 11:15 | **Tea**

11:15 – 12:00 | **Session 3: Governance considerations and policy priorities**
Aim: Cross-cutting governance issues apply as humanitarian technologies use multiple data and definitional sources with implications for data responsibility and accountability. This contends with increasing need for predictive technologies to give humanitarian organisations longer lead times for effective management of suffering within funding constraints. The aim of this session is to understand emerging governance issues, their approach, and negotiation with policy priorities on anticipatory action and predictive analytics.

Mengia Tshalaer, Member – Gender Committee and Research Fellow, ITFLOWS (Chair)
Jos Berens, Data Responsibility Officer, UN OCHA Centre for Humanitarian Data
Damien Jusselme, Head – Data Analytics and Innovation Unit, Global Migration Data Analysis Centre, IOM
Colleen Boland, Interim Project Coordinator and Researcher, ITFLOWS
Edgar Whitley, Associate Professor – Information Systems and Innovation, LSE

12:00 – 12:45 | **Session 4: Partnerships and collaborations**
Aim: Partnerships and collaborations are integral to the development, implementation, and governance of humanitarian technologies. This session looks at existing modes of partnerships and collaborations, forging newer ones, and where greater partnership and knowledge sharing might still be required.

Tilly Alcayna, Co-chair – Working Group on Anticipatory Action, Anticipation Hub (Chair)
Vicente Anzellini, Manager – Monitoring and Reporting Hub, Internal Displacement Monitoring Centre (IDMC)
Tonia Thomas, Research and Learning Lead, UK Humanitarian Innovation Hub (UKHIH)
Matthew Downer, Senior Manager – Research and Policy, Mobile for Humanitarian Innovation, GSMA
Rim Turkmani, Research Fellow and Director – Syria Conflict Research Programme, Department of International Development, LSE; Member of the Women's Advisory Board to the UN Special Envoy to Syria

12:45 – 13:15 | **Open discussion and thanks**

Discussion points:

•How to resolve access to data and contextual knowledge
•How to foster knowledge sharing and best practices
•Understanding technology-organisational-contextual fit
•Better understanding the development-implementation-governance continuum
•How to maintain and manage the ecosystem around humanitarian technologies
•How to establish a community of practice around humanitarian technologies

13:15 – 14:30 | **Lunch**

Participants

Foreign, Commonwealth and Development Office
Max Brodie and Phil Duloy

Brunel Migration Modelling and Simulation Group
Derek Groen, Diana Suleimenova, Alireza Jahani, and Yani Xue

UNHCR Innovation Service
Sofia Kyriazi

Danish Refugee Council
Bo Schwartz Madsen

Oxford Leverhulme Centre for Demographic Science
Douglas Leasure

Caribou Digital
Emrys Schoemaker

International Organisation for Migration
Robert Trigwell and Damien Jusselme

Save the Children
William Low

Royal College of Surgeons of England Humanitarian Surgery Initiative
Mai Seida

International Development and Information Systems and Innovation, LSE
Shirin Madon

BBC Media Action
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UK Humanitarian Innovation Hub
Tonia Thomas

GSMA
Matthew Downer

Syria Conflict Research Programme, LSE
Rim Turkmani

Elrha
Cecilie Hestbaek

Independent
Ben Grazda

Information Systems and Innovation, LSE
Anulekha Nandi

Background

In humanitarian emergencies, short response times and complex challenges highlight the importance of evidence-based decision-making to ensure efficient allocation of limited resources to those that need it the most. As a result, the sector has seen increased adoption of digital technologies and advanced computational techniques across a variety of operational needs amidst compounding crises. However, increased adoption of new and emerging technologies and expanding technical infrastructure of humanitarian management has raised new concerns about effectiveness, efficiency, and accountability. It has foregrounded outstanding issues in developing relevant and inclusive technologies around data requirements, contextual knowledge, situational awareness, and organisational capabilities.

However, the discourse spanning the potential for predictive analytics and concerns around them tend to be focused on outputs and implications without into account how outputs and implications come to be shaped by the development processes of such technologies. This was the starting point of a year long research into humanitarian technologies where I looked at the FLEE model, developed by the Brunel Migration Modelling and Simulation Group, as a case study. The insights from this research led to the development of this project funded by the LSE's Knowledge Exchange and Impact Grant.

For a year I followed the Brunel team to every meeting they had or attended, every event they hosted or were a part of, even any informal meetings they had with stakeholders. This project has been possible because of their openness, the access they afforded me, and the frankness with which they shared their learnings and their journey. This also includes explaining the minute workings and interdependencies of highly technical models to a person like me with no technical or computer science background, reviewing technical interpretations, and being generous with their time in answering questions whenever I had them. I owe an immense debt of gratitude to Derek, Diana, Alireza, and Yani (not to forget Hamid Arabnejad and Samuel Weekes) for their time.

This research process highlighted that as model development progresses through analytical reduction of reality, each iteration extends the functionality of the model as combined role of technical and contextual resources and expertise provided by an ecosystem of stakeholders. Further, each iterative development represents a social choice such as change, flexibility, performance, relevance, reliability etc. where each choice is shaped by the dynamics of the ecosystem within which the model develops and has its own set of implications for the output and its use. As each successive stage nests successive functionalities so does social implications of the choices made.

I summarise the preliminary findings of this research process in this working paper where I construct a process narrative by developing a historical account of the Flee model and identifying the interdependencies and social choice at each iterative stage of development. I then proposed a framework for evaluation that examines the considerations behind each social choice in the form of rationale, risks, conditions, and challenges to provide traceable steps for model evaluation. A social choice lens helps to look at the model as a socio-technical undertaking and captures some of the embedded choices and their social implications. This framework can potentially provide both a tool for evaluation as well serve as a guide for documenting model development by encouraging better compliance, transparency and accountability.

Anulekha Nandi.

Participating organisations and representatives

Foreign, Commonwealth and Development Office (FCDO)

FCDO's UK Humanitarian Framework sets out how it will deliver UK's humanitarian preparedness and response through its core objectives of prioritise, protect, and prevent. The key pillars of this approach involve broadening the expertise and funding base, harnessing diplomacy, putting science, technology and data at the centre of humanitarian response, strengthening agency of affected communities, maintaining UK's rapid response capability, building organisational capacity, and managing risk.

The FCDO is represented by ***Max Brodie***, Team Lead - Early Warning Monitoring, Alerting, and Risk Analysis and ***Phil Duloy***, Humanitarian Adviser, Humanitarian and Stabilisation Operations Team.

Max Brodie leads a team responsible for FCDO's humanitarian crisis early warning monitoring, alerting, and risk analysis. He has helped deliver FCDO responses to the Ukraine conflict, Tonga volcano eruption, and cyclones Eta and Iota. He is also responsible for management of the FCDO's ODA (Official Development Assistance) Crisis Reserve and FCDO's programmes with the Start Fund and the Red Cross' DREF. He has previously worked in the Cabinet Office Civil Contingencies Secretariat working on coordinating cross government recovery activity for 2015/16 North England flooding, Sousse terrorist attack, Grenfell Tower fire and the Salisbury incident by managing Ministerial Recovery Group and COBR meetings. In this role he was also policy lead for community, business and voluntary sector integration in emergency and disaster management in the UK.

Phil Duloy provides advice and analysis on a range of humanitarian themes to the UK government through the UKAID funded Humanitarian and Stabilisation Operations Team, where he is responsible for capacity building. His other work includes civil military coordination, advising the FCDO's Sanctions Directorate on means to mitigate humanitarian impacts, supporting the Crisis Management Directorate with disaster simulation exercises, peer reviewing for a number of journals, and developing research and methods to mitigate fire risks within humanitarian settlements. He is a mentor at Exeter University, guest lecturer at UCL, and is a member of a range of interagency technical working groups. He has developed global cluster-level guidance on LGBTQ inclusion and hosting as a form of humanitarian response and has previously worked for NGOs, the Red Cross Movement, and UN agencies in a number of capacities.

Brunel Migration Modelling and Simulation Group

The Migration Modelling and Simulation Group was founded in 2016, when Derek Groen and Diana Suleimenova first developed the Flee agent-based model. Since then it has grown into an established research effort, which has taken part in several international projects and informal collaborations. Particular project highlights include the HiDALGO Centre of Excellence project with 14 European institutions, where the Group developed the second version of Flee and a special implementation that takes into account weather and climate events, as well as the ITFLOWS project, where Flee aims to support NGOs by predicting refugee arrivals from five different conflicts. In addition, the Group maintains a number of informal collaborations, including with Save The Children where they collaboratively work on more advanced forecasting models for internal displacement in the context of conflicts in Nigeria and Ethiopia, and with the University of Columbia where they build forecasting models for Ukraine, and integrate Flee with the graphical web interface of the World Modellers Project. In addition to Flee they have developed a range of other tools such as conflict generators, automation tools and geospatial data extraction tools. In all cases, such tools are open source, freely available, and with support

provided by the team.

Flee

Flee is an agent-based modelling toolkit which is purpose-built for simulating the movement of individuals across geographical locations, released under a BSD 3-clause license. Flee is currently used for modelling the movements of refugees and internally displaced persons (IDPs). It provides users with the ability to define and use their models through a relatively straightforward application programming interface (API). There are a range of functional tests to allow users to verify the consistency of the code results. FLEE also features a range of scripts to handle and convert data, as well as an automated plotting tool for output generated by the simulation. The FLEE development process also resulted in the formalisation of the generic Simulation Development Approach (SDA) to shorten the time required to develop, validate, and execute these model in the face of sudden onset and rapidly intensifying forced displacement emergencies. The SDA involves three phases: identifying activities required for the development of application agnostic tools, identifying ways to adapt these models to specific scenarios, and the automating the above through existing software toolkits. As an agent-based model, distinct from machine learning, Flee is based on a rule set that assigns behaviour norms to agents within the model that simulates decision-making faced by displaced persons on the move. FLEE has developed a number of research approaches within its development process: Ensemble models where the model is run many times with slightly different assumptions to identify the sensitivity of certain factors for the agents' decision-making, Multiscale modelling including model and data coupling to improve overall accuracy, automated sensitivity analysis to identify pivotal assumptions that dominate validation results, forecasting models that estimate how many people are displaced when conflicts escalate, and multi-objective optimisation that combine artificial intelligence techniques and simulations that can be used to provide decision-support for camp placement. Flee is publicly available at: https://github.com/djgroen/flee and further instructions for using FLEE can be found here.

Brunel Migration Modelling and Simulation Group is represented by ***Derek Groen***, Reader in Computer Science; ***Diana Suleimenova***, Lecturer in Computer Science; ***Alireza Jahani***, Research Fellow in Coupled Agent-Based Modelling; and ***Yani Xue,*** Research Fellow.

Derek Groen is a Reader in Simulation and Modelling at Brunel University. He is also an Emeritus Fellow for the EPSRC-funded 2020 Science Network, a Fellow of the Software Sustainability Institute, and a Visiting Lecturer at the Centre for Computational Science at University College London. He is an interdisciplinary researcher who focuses primarily on multiscale modelling and high-performance computing including some of the major challenges that surround these topics. These include performance modelling and optimisation, distributed computing, new approaches for code coupling, and techniques to make intensive computational research easier and more efficient. He completed an MSc in Grid Computing at the University of Amsterdam (UvA) in 2006, and a PhD in Computational Astrophysics both at the UvA and Leiden University in November 2010. After his PhD he worked as a post-doctoral researcher on EU projects about distributed multiscale computing (MAPPER) and high-performance computing towards the Exascale (CRESTA). He received a 1-year position as a Fellow of 2020 Science in January 2015, and funded himself for two months through an EPSRC eCSE to work on new approaches for domain decomposition.

Diana Suleimenova is a Lecturer in the Department of Computer Science at Brunel University London. She is a member the Modelling and Simulation Group and the Computer Science for Social Good research groups. She holds a PhD in Computer Science, MSc in Information Systems Management and BA in Business Economics. After her PhD, she worked as a Research Fellow in Multiscale Migration Prediction the Horizon 2020 projects, namely Verified Exascale Computing

for Multiscale Applications (VECMA), HPC and Big Data Technologies for Global Systems (HiDALGO) and IT tools and methods for managing migration FLOWS (ITFLOWS). Her research focuses on agent-based modelling, forced displacement prediction, and verification, validation and uncertainty quantification (VVUQ) of multiscale applications deployed on emerging exascale platforms. Currently, she is also a Knowledge Exchange coordinator for the Software Environment for Actionable and VVUQ-evaluated Applications (SEAVEA), which aims to develop an exascale-ready toolkit for VVUQ techniques in application to various domains.

Alireza Jahani works as a Research Fellow in Coupled Agent-based Modelling in Computer Science. Before joining Brunel University London, he was the Deputy of Technical and Information Services and Assistant Professor at Faculty of Information Technology, Mehralborz University (MAU), Iran. He obtained his PhD in Computer Science from University Putra Malaysia (UPM) in 2014 and he received his Master of Science in e-Commerce from Iran University of Science and Technology in 2008. He specialises in agent-based modelling, multi-agent systems, machine learning, and knowledge management.

Yani Xue is a Research Fellow at Brunel University London. She received her PhD degree in Computer Science from Brunel University London in 2021. Her main research interests include multi/many-objective optimisation, evolutionary computation, search-based software engineering, engineering applications, simulation, and high performance data analytics.

UNHCR Innovation Service

The UNHCR Innovation Service aims to create an enabling environment for experimentation to flourish. It incentivises innovation through funding and technical support which can help deliver UNHCR's mandate more effectively. The Innovation Service provides funds to accelerate innovation and equip staff with knowledge, resources, and skills that can help alleviate the suffering of the forcibly displaced. These include the Digital Inclusion Fund that aims to provide digital rights and opportunities for the displaced populations; Innovation, Environment and Resilience Fund for innovation at the nexus of environment and displacement; Data Innovation Impact fund for using computational capabilities to shape the future of refugee protection; and Refugee Led Innovation Fund to empower displaced communities to innovate.

Data innovation at UNHCR

Data innovation at UNHCR aims to responsibly explore artificial intelligence, big data analytics, intelligent automation and other exponential technologies. This programme works to innovate, experiment and leverage data in new and creative ways to improve UNHCR's work and the lives of the people it serves. Innovative solutions include ethics and human rights-based approaches, responsible data practices, evidence-based humanitarian decision making, and privacy-enhancing technologies that can shape the future of the humanitarian sector. The Innovation Service's work on big data and artificial intelligence takes many forms, including support and services to operations; training on bias, ethics and human-rights based approach; partnering with non-traditional actors to explore creative approaches; and other dedicated projects. The Innovation Service's Project Jetson was one of the earliest predictive models in humanitarian management when it started in 2017. Project Jetson is a machine learning based application that combines data science, statistical processes, design thinking and qualitative research methods. It aimed to provide UNHCR operations predictions about movements of refugees and internally displaced people over time. It involved extensive field research to define variables to inform an index that provides short-term predictions of expected migration flows. Jetson works in collaboration with academic partners like the University of Essex and other UN institutions such as UN Global Pulse and UNITAR. You can

read further documentation and publication on Project Jetson here. Apart from Project Jetson, the Innovation Service has other projects in its portfolio, these formed the basis of its ongoing research into the transformative potential of digital technologies and implications for "complex power dynamics between humanitarians, principled assistance, and affected communities during acute crises" as captured in this journal article on 'Explicability of humanitarian AI: A matter of principles'.

UNHCR Innovation Service is represented by **Sofia Kyriazi**, Artificial Intelligence Engineer

Sofia Kyriazi is an Artificial Intelligence Engineer at the UNHCR Innovation Service. She supports UNHCR's artificial intelligence projects, focusing on a wide array of challenges related to predictive analytics and natural language processing in order to build organisational capabilities for the future of displacement. She has previously held positions at IBM and CERN where she experimented in cognitive systems research and full stack solutions development. She holds an Undergraduate Degree in Computer Science and Telecommunications from the University of Athens, with a focus on Information Processing. She also holds a Masters' Degree with a focus on Human Media Interaction from the University of Twente in the Netherlands.

Danish Refugee Council (DRC)

DRC is Denmark's largest, and a leading international NGO with a specific expertise in forced displacement. It has 7500 staff in 40 countries working towards protecting, advocating, and building sustainable futures for refugees and other people and communities affected by displacement. DRC works across all stages of displacement: in acute crisis, in exile, settlement and integration, or return. It provides protection and life-saving humanitarian assistance and supports displaced persons in becoming self-reliant and included in host societies. DRC works with civil society and responsible authorities to promote the protection of rights of displaced people and peaceful coexistence. Its 6,000 volunteers in Denmark make an invaluable difference in integration activities throughout the country.

Foresight model

DRC developed the Foresight model in 2019 with support from IBM and the Danish Ministry of Foreign Affairs. The Foresight model is a machine learning model that is designed to provide strategic forecasts for forced displacement along with scenario analysis at country level with lead times of 1-3 years. The model is based on macro-level indicators representing the root causes or pre-disposition for displacement like: economy (e.g. unemployment, GDP, poverty), violence (e.g. civilian fatalities, number of conflict events, etc.), governance (e.g. corruption, access to public services, democracy, etc.), environment (e.g. food security, natural hazard events, etc.), social/population (e.g. presence of vulnerable groups, urbanization, population size). The categories were identified based on DRC's experience in the field, as well as adopting standard groupings used to describe fragility e.g. by the OECD, State Fragility Index etc. The data is derived from open sources and main data sources include the World Bank development indicators, ACLED, UCDP, EMDAT, UN agencies (UNHCR, WFP, FAO), IDMC etc. The model now covers 26 different displacement-producing countries. Of the more than 150 forecasts made so far across the 26 countries, approximately half have a margin of error of 10% or below and 2/3 have 15% or below. The model generally outperforms the accuracy of the planning figures being used in Humanitarian Response Plans, which is used as one of the benchmarks. The model has so far been used in the Danish Refugee Council (DRC) annual strategic planning cycle. This includes providing country offices with forecasts of displacement to inform the contextual analysis, as well as scenario-based forecasts of how displacement can potentially unfold. This helps DRC in being better prepared for contextual developments and engage in mitigation efforts. DRC is

further exploring the potential of linking Foresight with an anticipatory financing mechanism. It has also been used by external partners to inform strategic planning. As an example, the model has been used in HNO process for Central America, as well as been used by OCHA CERF in funding allocation decision-making. The model is hosted on an online platform, where it is possible to access the underlying data, see the forecasts for the different countries and develop scenario-based forecasts of displacement.

Current Predictive Analytics Projects at DRC

Current work at DRC focuses on subnational models of displacement, in particular two specific projects: A subnational model of displacement in the Sahel and a drought-induced displacement model in Somalia. The Sahel project is an ongoing initiative which attempts at leveraging data on conflict, food security and climate to estimate displacement at the administrative level 1 in Mali, Burkina Faso and Niger. In Somalia, a model co-developed with IDMC is being used to estimate the relationship between climate, pastoralist livelihoods and displacement because of drought. The project is currently developing a mechanism for anticipatory action together with local communities in three specific locations. The designed actions will be triggered in advance if outlooks in the forecasts reach certain thresholds.

Additional resources:

- A machine learning approach to scenario analysis and forecasting of mixed migration;
- Global displacement forecast 2022 – July update;
- Scenario base XAI for humanitarian aid forecasting;
- Reviewing the Danish Refugee Council's Foresight Model

Danish Refugee Council is represented by **Bo Schwartz Madsen**, Data Scientist

Bo Schwartz Madsen is a Data Scientist at the DRC working on their Foresight model and other quantitative projects and has been with the DRC for nearly 5 years. He believes methods and results should be communicated with effort, so they are clear to the recipients, answers questions and give rise to new ideas. In his approach, he aims to find complementarities between data and algorithms through collaborations with partners, co-workers, and recipients. His specialities are in data analysis, statistical methods, predictive modelling, machine learning, data visualisation, web scraping, communication, and teaching.

Oxford Leverhulme Centre for Demographic Science

The Leverhulme Centre for Demographic Science (LCDS) aims to build an internationally recognised centre of demographic science that will disrupt, realign and raise the value of demography in science and society. Societies and economies face unprecedented global demographic challenges, including radical shifts in age structures, global aging, rapid population growth in some areas but decline in others, substantial sudden flows of migrants and refugees, diverse families and fertility patterns and population-related environmental threats. Its research is driven by enquiry into harvesting and linking classic and new types of data, alongside innovative approaches and methods to generate accurate, timely and effective demographic knowledge and predictions to resolve the most challenging demographic problems. It has seven tightly interconnected research programmes in Nowcasting: Digital and Computational Demography; Environmental Context, Demography and Climate Change; Inequality and Diversity; Sociogenomics: Nature and Nurture; Causal Demography; Demography, Society and Global Sustainability; and Ethics, Truth and Trust. Producing real-time nowcasting of demographic processes – with a focus on inequality – diversity and environmental context. Its

interdisciplinary approach unites top minds from the diverse disciplines of demography, sociology, economics, history, philosophy, geography, marketing, statistics, informatics, molecular genetics, and biology, to bring the 'science' into demography to accelerate and disrupt the discipline.

Nowcasting daily population displacement in Ukraine through social media advertising data

Abstract from research paper: In times of crisis, real-time data mapping population displacements are invaluable for targeted humanitarian response. The Russian invasion of Ukraine on 24 February 2022 forcibly displaced millions of people from their homes including nearly 6 million refugees flowing across the border in just a few weeks, but information was scarce regarding displaced and vulnerable populations who remained inside Ukraine. We leveraged near real-time social media marketing data to estimate sub-national population sizes every day disaggregated by age and sex. Our metric of internal displacement estimated that 5.3 million people had been internally displaced away from their baseline administrative region by 14 March. Results revealed four distinct displacement patterns: large scale evacuations, refugee staging areas, internal areas of refuge, and irregular dynamics. While this innovative approach provided one of the only quantitative estimates of internal displacement in virtual real-time, we conclude by acknowledging risks and challenges for the future.

The paper can be accessed from: https://doi.org/10.31235/osf.io/6j9wq

LCDS Is represented by **Douglas Leasure**, Senior Researcher and Senior Data Scientist

Douglas Leasure's research spans demography, population ecology, Bayesian statistics, and GIS/remote sensing. He specialises in developing novel methods to map population sizes and demographics with high spatial resolution in data-sparse settings by supplementing traditional survey data with innovative new data sources including social media activity and space-based Earth observations. His work developing bespoke hierarchical Bayesian modelling approaches aims to account for uncertainty in demographic estimation processes to support informed decision-making for crisis response, census support, government services, and global health initiatives. To promote research with real-world impacts, Doug is committed to open science and enjoys developing web applications that translate scientific results into easy-to-navigate interactive maps and tools to facilitate uptake by stakeholders globally. Before joining LCDS at the University of Oxford, Doug led the Spatial Statistical Population Modelling team in the WorldPop Research Group at the University of Southampton developing Bayesian statistical models and applying machine learning approaches to produce high resolution population estimates supporting initiatives of the Bill and Melinda Gates Foundation and the United Nations Population Fund. He was previously a post-doctoral research associate at the River Basin Center in the Odum School of Ecology, University of Georgia developing statistical models for NASA's Ecological Forecasting program. He completed a PhD in Biological Sciences at the University of Arkansas where he held a Doctoral Academy Fellowship and was a post-doctoral research associate for the Cooperative Fish and Wildlife Research Unit of the United States Geological Survey.

Caribou Digital

Caribou Digital is a research and advisory firm that helps clients change the world by building inclusive and ethical digital economies. Its team of experts work across a range of sectors and businesses, from start-up financing to data analytics, financial inclusion and socio-economic development to ensure its clients lead the field in the use of technology to deliver equitable and sustainable development. Using experience, empathy, pragmatism it looks at the central role start-ups and large companies play in ensuring that digital products, services, and markets unlock human capabilities and drive

sustainable growth. It specialises in understanding digital users and the way digital platforms create new social and cultural digital repertoires; understanding digital economies and ecosystems, and the new businesses models within them; understanding digital entrepreneurs, and what support and enabling environments they need to succeed, and developing monitoring and evaluation and learning strategies to assess the impact of digital programmes.

Caribou Digital is represented by **Emrys Schoemaker**, Research Director

Emrys Schoemaker is a researcher and strategist interested in the interaction between digital technologies and social, political and economic change. At Caribou Digital his research and advisory work focuses on technologies in emerging markets, including mobile, internet and identification systems. Emrys is a Visiting Fellow at the Graduate Institute in Geneva, at Cornell Tech in NYC and the LSE – where he also gained his PhD focusing on the relationship between social media and identity. This involved a year of ethnographic research on the interaction of religious identity and Facebook use in Pakistan. Emrys has also worked in strategic communications and development advising governments, donors, multilateral organisations such as the World Bank and United Nations as well as national and international NGOs. He also co-founded iMedia Associates, a media and communications company and Ekatay, a software company providing services to the international development sector. He has a background in community development and mediation, conflict resolution, communications and research and runs workshops on these for a wide range of clients. He is from the Cotswolds in the UK and has worked across South Asia, Africa and the Middle East, and lived in Nepal, Pakistan and New York.

International Organization for Migration (IOM)

Established in 1951, IOM is the leading intergovernmental organisation in the field of migration committed to the principle that humane and orderly migration benefits migrants and society. IOM is part of the United Nations system, as a related organisation. IOM supports migrants across the world, developing effective responses to the shifting dynamics of migration and is a key source of advice on migration policy and practice. The organisation works in emergency situations, developing the resilience of people on the move, particularly those in situations of vulnerability, as well as building capacity within governments to manage all forms and impacts of mobility. The Organisation is guided by the principles enshrined in the Charter of the United Nations, including upholding human rights for all.

Displacement Tracking Matrix (DTM)

DTM is a system to track and monitor displacement and population mobility. It is designed to regularly and systematically capture, process and disseminate information to provide a better understanding of the movements and evolving needs of displaced populations, whether on site or en route. Conceptualised in 2004 in Iraq, for IDP assessments and monitoring exercises, the DTM has been continuously refined and enhanced through years of operational experience in countries in both conflict and natural disaster settings. It delivers essential role in providing primary data and information on displacement, both in country and at the global level. It is comprised of four distinct components:

- Mobility Tracking: regularly tracks numbers, locations and cross-sectorial needs of observed populations to target assistance
- Flow Monitoring: tracks movements of mobile populations at key transit points to identify scale and direction of flows and reasons for movement

- Registration: individual and household level information used for functional identity management in beneficiary selection, vulnerability targeting and programming
- Surveys: gathers specific information through sampling from the population of interest, in regard to return intention, displacement solutions, community perception, and other thematic areas

DTM data includes information relevant to various humanitarian sectors such as water and sanitation, health, food and protection, making the resultant DTM data useful to a broad range of humanitarian and development actors. The system flags urgent concerns (e.g. protection concerns, food shortages, sanitation problems, diseases, etc.) to relevant sectorial coordination focal points or National Disaster Management Agencies for follow up to help ensure that displaced populations are living in conditions which meet minimum requirements as defined by international guidelines. The DTM is also an accountability mechanism, reflecting complaints in assistance and perceptions on responsiveness to identified needs. In addition to being systematically deployed in medium to large-scale humanitarian response operations, DTM has also proven to be highly effective as a preparedness tool, as well as in support of the recovery and transition phase of the response. Integrating DTM into capacity building activities, mapping of potential evacuation and displacement sites, and setting up the DTM prior to a disaster are some examples of how the DTM can be employed as an effective preparedness measure. The implementation in Haiti (since 2010) and Mali (since 2012) has also shown DTM's aptitude to support the recovery and return process.

Further resources: Displacement, Migration, Reports

Global Migration Data Analysis Centre (GMDAC)

GMDAC was established in 2015 at the invitation of the Government of Germany to respond to calls for better international migration data and analysis. Data is key to inform migration governance, improve programming and promote a better public understanding of migration. Its Global Migration Data Portal had 2.2 million users in 2021 with 80,000 – 100,000 page views each month. It has developed the Global Migration Governance Database including data on 94 different countries and 51 local authorities. It developed the Data Innovation Directory with including 60+ initiatives from across sectors using data innovation in migration policy and research. It has piloted migrant sentiment analysis in collaboration with Amazon Web Services and organised expert level events on migration related data innovation that reached 450+ viewers. It has established partnerships with Africa Migration Data Network with the Africa Union, the Big Data for Migration Alliance with European Commission Joint Research Centre, and the GovLab. It co-chairs the UN Expert Group on Migration Statistics and the International Data Alliance for Children on the Move. It has documented more than 48,000 deaths and disappearances during migration since 2014 and its project database is used as an indicator for SDG 10.7.3. GMDAC aims to strengthen the role of data in global migration governance (e.g. Global Compact for Migration, Sustainable Development Goals), support IOM Member States' capacities to collect, analyse and use migration data, and promote evidence-based policies by compiling, sharing and analysing IOM and other sources of data.

Further resources: Active projects, Past projects

IOM is represented by **Robert Trigwell**, Senior DTM Coordination Officer and **Damien Jusselme**, Head - Data Analytics and Innovation Unit at GMDAC

Robert Trigwell has extensive experience in humanitarian response and has worked towards creating better datasets for effective humanitarian management and decision-making. His work on the DTM has spanned product development and

governance including capacity-building, programming, and partnerships. He has provided mission support to the DTM surge teams and has overseen IOM's Collective Intelligence Initiative including system development and AI enhanced analysis. His expertise lies in the implementation of innovative research practices with humanitarian partners. He is dedicated to shaping humanitarian practices through an evidence based data driven approach with proven results. Rob has coordinated multiple humanitarian programmes across Libya, Jordan, Bangladesh, Iraq, Philippines, South Sudan, Nepal, Myanmar, Europe and Ethiopia. He combines his extensive experience in field research methods with an analytical approach across a number of humanitarian contexts in high pressure and political environments. Rob is also an active contributor to open data initiatives.

Damien Jusselme leads the work on Data Analysis and Innovation at IOM's GMDAC in Berlin. He also leads the analysis of big data sources shedding light on various displacement and migration contexts and supports forecasting projects. Prior to joining GMDAC, Damien has served as IOM's Head of the Regional Data Hub in Dakar. Since 2011, he has held multiple positions within IOM working on the Organisation's migration and displacement data in Haiti, Mali, the Central African Republic, and West and Central Africa Regional Office, and on monitoring and evaluation in Yemen. Damien also worked with NGOs on monitoring and evaluation in Haiti and displacement data in Geneva supporting the Syria response, migrant profiles in Greece, displacement profiling in Somalia or durable solution exercises in Ukraine and Georgia. Damien holds a Master's degree in Economics and international project management and a Master's degree in International Relations.

Save the Children

Save the Children is an international charity that aims at improving the lives of children through better education, healthcare, economic opportunities, and providing aid in humanitarian emergencies like war, conflict, and natural disasters. It helps coordinate emergency relief efforts and protect children from the effects of war, violence, and displacement. Operating as part of a movement that works in 120 countries, it works on conflict and humanitarian response and designs and implements change-making strategies.

Predictive analytics and innovation at Save the Children

Globally, an estimated 34 million children have been forced to flee their home as a result of persecution, conflict or violence – and the scale of the crisis is growing. Today, the number of people who are forcibly displaced is around four times higher than in 1995. Children are disproportionately affected by displacement, in terms of their education, health, and exposure to risks and harms. Poor-quality data and a lack of understanding of displacement trends undermine our ability to respond effectively by prioritising the right resources in the right locations at the right time. These data constraints make it challenging to predict how many people will be displaced by a crisis and to where, their demographic profile, and how long the displacement will last. To address this challenge, Save the Children's Migration and Displacement Initiative (MDI) embarked on its Predictive Displacement (PD) project, applying data analytics to predict the characteristics of mass displacements. Such technologies can enable aid agencies, governments, donors and partners to make better-informed decisions, deliver more sustainable responses and target support to children more effectively. The project encompasses machine learning and agent-based models, and is working with the Brunel Migration and Simulation Group at Brunel University. Agent-based approaches offer an exciting new approach to modelling displacement, reducing our reliance on incomplete and constrained humanitarian data.

Save the Children is represented by **William Low**, Project Lead – Migration and Displacement Initiative

William Low is Project Lead of the Predictive Displacement project for Save the Children's Migration and Displacement Initiative. He manages the development of innovative models and tools to predict the characteristics of conflict-induced mass displacement events. He has more than ten years of experience in the international development and humanitarian sector, initially in management and operational-focused positions, later in data innovation and geospatial roles.

Royal College of Surgeons of England – Humanitarian Surgery Initiative

The Humanitarian Surgery Initiative (HSI) is an international collaboration led by the Royal College of Surgeons of England (RCS England), which seeks to examine the potential role and contribution of technology and data-driven evidence in building humanitarian surgical capacity, resilience and preparedness in low resource settings. A central component of this collaboration involves exploring potential platforms and tools that can be used to develop sustainable models for delivering training, mentorship, knowledge exchange, data management and evidence-based policy research. HSI aims to scope the current use of existing digital platforms and technology in delivering surgical training and online learning in low resource settings; assess the opportunities and challenges of introducing technology-enabled training as a sustainable solution for strengthening the humanitarian surgical capacity and preparedness of local and national staff in low resource settings. The collaboration is funded by the UK Humanitarian Innovation Hub (UKHIH) and collaboration partners include Médecins Sans Frontières (MSF), the Centre for Innovation in Global Health (CIGH) at Stanford University and the Global Surgery Policy Unit (GSPU), which is a strategic joint venture between RCS England and the LSE.

HSI is represented by **Mai Seida**, Global Programmes Officer at RCS England

Mai Seida currently works as the Global Programmes Officer at RCS England, where she is responsible for coordinating and supporting HSI. A pharmacist by training, she also has an MSc in Global Health and Development from UCL. She has previously worked for and volunteered with several humanitarian and health charities in the UK and Egypt, implementing programmes to support the healthcare needs of refugees and asylum seekers and advocating for migrants rights to access the healthcare they need. These include Doctors of the World UK, Save the Children Egypt and Africa and Middle East Refugee Assistant Organisation (AMERA International).

Shirin Madon, Associate Professor – International Development and Information Systems and Innovation

Shirin Madon is Associate Professor of Information Communication Technologies and Socioeconomic Development. She works jointly in the Departments of International Development and Management (Information Systems and Innovation Faculty Group) at LSE. Shirin teaches on the topics of information communication technologies for socioeconomic development and on humanitarian emergencies management and development. Shirin is currently involved in interdisciplinary longitudinal research based in rural India and Tanzania with the aim of understanding and actively participating in strengthening accountability in primary healthcare delivery. A second area of research investigates the current drive towards impact sourcing as a promoter of inclusive growth and development based on a study of this activity in rural Karnataka, India. More recently, Shirin has been digital identity platforms and interoperability in humanitarian management. Shirin currently serves as Associate Editor for Information Technology and People, and Information Technology for Development. Her latest paper with Emrys Schoemaker is on 'Digital Identity as a platform for improving refugee management'.

BBC Media Action

BBC Media Action is the BBC's international charity, which uses media and communications for good. It supports independent media essential to democracy and development by driving change informing and connecting audiences, providing trusted information, stories and ideas that generate discussion and bridge divides. It works in 24 countries around the world, reaching more than 100 million people a year – helping to save lives and improve health, protect livelihoods, challenge inequality and build more peaceful and democratic societies. Its strategy focuses on governance, health, building resilience and response to humanitarian crises.

Communication in emergencies

In humanitarian crises, people need answers to basic questions such as: Where can we find food, shelter and water? How can we protect ourselves? What can we do to avoid the spread of disease? In crises, BBC Media Action works with local media and the e humanitarian sector to understand audiences' communication needs and how best to reach them with accurate and relevant information. A synthesis of evaluations of BBC Media Action's work responding humanitarian emergencies in Lebanon and Jordan, Gaza, West Africa, Nepal, Somalia and Bangladesh concluded that appropriate media content can help people cope in the most difficult circumstances. It does this by enhancing people's knowledge, providing psychosocial support, connecting people, prompting discussion, and motivating people to take positive actions. The research findings also show that not only do people expect humanitarian communication to provide local and relevant information, but they also expect it to be engaging, to give them a voice, to hold humanitarian responders to account and to be easy to access, and to provide local and relevant information.

BBC Media Action is represented by **Mahdi Zaki**, Research Manager – Afghanistan and **Nicola Bailey**, Senior Research Manager

Mahdi Zaki was born in Afghanistan. He has studied Human Rights and International Relations. He has worked with several think tanks in Afghanistan and currently works with BBC Media Action as a research manager for the Afghanistan office.

Nicola Bailey has worked for BBC Media Action for the last 7 years, specialising in conducting research to support humanitarian communication initiatives. Prior to that she worked as Research and Learning office at the CDAC (Communicating with Disaster affected communities) Network. She has an MSc in Public Health.

ITFLOWS (IT Tools and Methods for Managing Migration Flows)

The ITFLOWS Consortium of fourteen academic, non-profit and private sector institutions across Europe aims to generate novel insights on migration and to provide accurate predictions and simulations, as well as adequate management solutions, for asylum and migration flows to the European Union. It addresses these flows in the phases of reception, relocation, settlement and integration, according to a wide range of human factors and using multiple sources of information. These insights are provided by an evidence-based ICT enabled solution (the EUMigraTool) and precise models, with a humanitarian purpose limitation. All solutions aim to have fitness for purpose by being continually validated by policy-makers and practitioners in cooperation with civil-society organisations in a dynamic and iterative process through its users board, ethical committee, expert advisory board, gender committee, and the policy working

group.

EUMigraTool (EMT)

EMT is a solution oriented tool that aims to (1) predict or simulate migration and asylum flows and (2) detect risks of tension related to migration in Europe. The EMT consists of two models (i.e., small-scale and large-scale), with various features already available in its preliminary release (exclusively to the ITFLOWS Users Board) and future features planned and in development. It draws on a wide range of open-source, publicly available datasets curated by ITFLOWS researchers, relating to migration push and pull factors, public attitudes towards migration, and real time data from Twitter, Google Trends and the GDELT Project (a global event database procured from news information). This is fed into a repository where data is anonymised as necessary, processed and cleaned, stored, managed and maintained. This data repository, namely CKAN, feeds into the EMT's back-end, which also stores output and reports from simulations, AI models and data analytics. The front-end, visible to the end-user of the EMT, includes advanced visualisations and the possibility to customise them that relates to predictions and forecasts or risks of tension and attitudes towards migration. The Small-Scale Model (SSM) offers simulations of the distribution of incoming asylum seekers/unrecognised refugees arriving to neighbouring countries when leaving conflict at countries of origin. The SSM offers a generalised and automated simulation development approach with a Flee agent-based simulation code, optimised for simplicity and flexibility. The Large-Scale Model (LSM) produces monthly forecasts of asylum applications (using data from Eurostat) in the EU for a variety of bilateral (i.e., from country of origin to the EU Member State) cases. It is based on state-of-the-art machine learning approaches, including neural network architectures and time series analysis. The LSM also provides intuitions on attitudes towards migration among populations in the selected ITFLOWS EU destination countries, using the Twitter Sentiment Analysis model data as input, and the most influential or relevant determinants of attitudes towards migration. In the case of the predictions and simulation function, the EMT aims to help humanitarian NGOs understand the human effort and material resources that need to be allocated in that particular territory before the arrival. The feature on attitudes towards migration is directed towards local governance that seeks to mitigate tensions related to migration. The Consortium has done extensive work on harmonising definitional issues through a glossary of terms; ethics handbook for interviewing migrants, refugees, and asylum seekers; regulatory model for ITFLOWS; and EU legal, ethical, data protection and human rights framework and ongoing monitoring for ITFLOWS research, activities and recommendations.

The ITFLOWS Consortium is represented by **Mengia Tschalaer**, Research Fellow and Member - Gender Committee and **Colleen Boland**, Interim Project Coordinator and Researcher

Mengia Tschalaer is a legal and social anthropologist whose work examines how Westernized conceptions of human rights affect the access to justice of minority groups at the intersection of race, gender, sexuality and religion. Between 2018 and 2020 she led an EU funded project which examined the experiences of LGBTQI+ asylum seekers with Muslim background within Germany's asylum system. She has authored various articles and chapters on socio-legal resistance, gender, sexuality, migration/asylum, and Islam. She is the co-founder and coordinator of the Queer European Asylum Network. Mengia is an Assistant Professor of Anthropology and Political Science at City University of New York and an Honorary Research Fellow at the School of Sociology, Politics and International Studies at the University of Bristol, UK. She is further a Board Member of the Gender Committee and a Research Fellow to the ITFLOWS project at Brunel Law School.

Colleen Boland currently works as postdoctoral researcher at the Autonomous University of Barcelona, serving as Interim Scientific Coordinator of the EU Horizon2020 ITFLOWS project, where she also is a researcher and forms part of its Gender Committee. She also coordinates “Gendered crimmigration discourse and practices: Catalan case and multilevel governance potential," funded by the Institut Català Internacional per la Pau. Other recent projects include "Crimmigration in Europe: Compounded Dilution of Asylum-seekers’ and Women’s Human Rights," conducted as a 2021-2022 re:constitution Fellow (a Forum Transregionale Studien and Democracy Reporting International program funded by Stiftung Mercator). Her earlier research addressed identity construction among youth of migrant origin, as well as aspirational outcomes and experiences of discrimination, with a particular focus on European Muslim youth. Current research interests include EU refugee and migration flows within broader international migration studies and diversity management.

UN OCHA Centre for Humanitarian Data

The Centre for Humanitarian Data is focused on increasing the use and impact of data in the humanitarian sector. It is managed by the United Nations Office for the Coordination of Humanitarian Affairs (OCHA). The Centre’s services are available to humanitarian partners and OCHA staff in the field and at Headquarters free of charge. The Centre is focused on four areas: 1) data services; 2) data literacy; 3) data responsibility; and 4) predictive analytics. Its vision is to create a future where all people involved in a humanitarian situation have access to the data they need, when and how they need it, to make responsible and informed decisions. The main outcomes it wants to deliver include: speed of data, increased connections in the network, and increased and better use of data in humanitarian response. The Centre adheres to the following principles: human-centred design approach, openness in terms of collaboration and open source software and standards available through GitHub, networked in its working as a part of data focused partners, and agile where it adapts to new demands and innovations. Although the Centre supports a range of activities, it directly manage two products: the Humanitarian Data Exchange (HDX) and the Humanitarian Exchange Language (HXL). The goal of HDX is to make humanitarian data easy to find and use for analysis. Launched in July 2014, HDX has a growing collection of datasets about crises around the world and has been accessed by users in over 200 countries and territories. HXL is a data standard or a ‘simple standard for messy data’. The use of HXL is focused on spreadsheet formats such as CSV or Excel. HXL hashtags are added between the column headers and the data to allow software to process data more easily and create insights more quickly. You can read more about HDX and HXL in Data Services or in this one-pager. You can also take a look at the Frequently Asked Questions for HDX.

Data responsibility

Data responsibility in humanitarian action is the safe, ethical and effective management of personal and non-personal data for operational response. It is a critical issue for the humanitarian system to address and the stakes are high. OCHA’s role as data aggregator offers an unique perspective into the multiple dataflows that exist within a crisis response and the many ways data is managed. The Centre’s data responsibility work is focused on developing guidance, processes and practices for how OCHA handles data as the coordinator of humanitarian response. The Centre also provides advice to stakeholders on data security. Humanitarian organisations collect, process and use increasingly large volumes of data. This data can include sensitive personal and non-personal data about affected people that enables the identification and tracking of individuals or groups. The disclosure of sensitive data in humanitarian response can lead to already vulnerable people and communities being further harmed or exploited. In addition to avoiding harm, the safe, ethical and effective management of data has a number of benefits: it can lead to more informed and transparent decision-making, more efficient humanitarian response, and increased trust among humanitarian actors and with the people they seek to serve.

Data responsibility guidance

After two years of field testing and feedback, the Centre finalized the OCHA Data Responsibility Guidelines ('the Guidelines') in October 2021. The Guidelines offer principles, processes and tools to support OCHA's data work. They apply to all operational data managed directly by OCHA (such as who-is-doing-what-where), or data managed by humanitarian actors within activities coordinated by OCHA (such as needs assessments). The Guidelines also address how OCHA should implement the IASC Operational Guidance on Data Responsibility in Humanitarian Action, which was endorsed in February 2021 after a year-long consultation process jointly led by the Centre, the International Organization for Migration (IOM) and the UN High Commissioner for Refugees (UNHCR) and involving over 20 organizations. The IASC Operational Guidance recommends a set of actions for data responsibility at different levels of a response and includes templates to support organisations, clusters/sectors, and inter-agency working groups and coordination mechanisms in adopting data responsibility. Together with the Danish Refugee Council (DRC), IOM, and UNHCR, the Centre co-chairs the Data Responsibility Working Group (DRWG) to help monitor progress on the implementation of the IASC Operational Guidance and provide advice to our community. The Centre has also worked with a range of partners since 2019 to publish a series of guidance notes on data responsibility. These notes offer advice on specific issues related to data responsibility in practice. This series was supported in 2019 and 2020 by the Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG ECHO) and continues in 2021 and 2022 with support from the Government of Switzerland. French and Spanish translations of the guidance notes are available here. The guidance comes amid growing recognition of the importance of data responsibility in humanitarian operations.

Data Security

As part of its role in managing HDX, the Centre is aware of the various types of sensitive data that are collected and used by its partners to meet needs in humanitarian operations. While organisations are not allowed to share personal data on HDX, they can share survey or needs assessment data which may (or may not) be sensitive due to the risk of re-identifying people and their locations. This data is often challenging to identify without deeper analysis. The Centre applies statistical disclosure control (SDC) to all microdata shared on HDX to determine the risk of re-identification of individuals and groups. The Centre has also integrated a detection tool from Google called Cloud Data Loss Prevention (DLP) into the HDX dataset screening and Quality Assurance (QA) process. For other potentially sensitive data, the Centre works with context experts to determine the level of sensitivity and appropriate mechanisms for sharing. Learn more about how to conduct a disclosure risk assessment here.

Partnerships

In addition to developing practical guidance, the Centre works to build trust through dialogue by convening conversations about data responsibility and related issues within its global network. In May 2019, the Centre held an event at Wilton Park in the UK on 'Data responsibility in humanitarian action: from principle to practice'. The event yielded three areas for collective action and a number of steps that the Centre and its partners can take to make progress on data responsibility. In September 2020, the Centre, the International Committee of the Red Cross (ICRC) and the Government of Switzerland launched the Humanitarian Data and Trust Initiative (HDTI) to advance the protection and responsible use of humanitarian data. Through its three pillars of Policy and Dialogue, Research and Development and Education and Outreach, the HDTI aims to connect technological expertise with policy research and catalyse collective action on data responsibility. Learn more about the HDTI here.

Resources

- An Introduction to Disclosure Risk Assessment
- "Bridging the Gap of Humanitarian Data" (Digital Impact Podcast about the Working Draft OCHA Data Responsibility Guidelines)
- "Data to the rescue: how humanitarian organisations use information" (Babbage Podcast recorded live at Wilton Park)
- "Data Incidents: Design with Responsibility in Mind" (Digital Impact Podcast about Data Incident Management)
- UN Personal Data Protection and Privacy Principles
- Handbook on Data Protection in Humanitarian Action, ICRC and Brussels Privacy Hub
- UN General Assembly Resolution A/RES/45/95 on the Regulation of Computerized Personal Data Files

UN OCHA Centre for Humanitarian Data is represented by **Jos Berens**, Data Responsibility Officer

Jos Berens is Data Responsibility Officer at the United Nations Office for the Coordination of Humanitarian Affairs' Centre for Humanitarian Data in The Hague. The Centre's mission is to increase the use and impact of data in the humanitarian sector. The Data Responsibility work stream is focused on developing processes and practices for responsible management of data in humanitarian response. Prior to joining the Centre, Jos organised the International Data Responsibility Group from the Centre for Innovation at Leiden University. He has collaborated and published with various international organisations, universities and think tanks. Jos' work revolves around the ethical and legal considerations associated with the use of digital data for crisis-affected people. He holds an LLM in Public International Law from Utrecht University and a BA in Philosophy of a Specific Discipline from Groningen University.

Edgar Whitley, Associate Professor – Information Systems and Innovation, LSE

Edgar Whitley is an expert on digital identity and data governance and is an advisory board member for the Ada Lovelace Institute's Ryder review of Biometric Regulation and an expert adviser for a series of Ada Lovelace Institute reports on technological responses to COVID-19. Edgar is co-chair of the Privacy and Consumer Advisory Group (PCAG) to the Government Digital Service and GOV.UK and a member of the Cabinet Office Digital Economy Act 2017 Debt and Fraud Information Sharing Review Board and the Cabinet Office Digital Economy Act 2017 Public Service Delivery Review Board, as well as a member of the DCMS National Data Strategy Forum. He is an academic member of the DCMS College of Experts. Edgar is also a member of the Scottish Government Digital Identity Scotland Expert Group and the Open Banking Expert Group. He was the research coordinator of the influential LSE Identity Project on the UK's proposals to introduce biometric identity cards; proposals that were scrapped following the 2010 General Election. His book with Gus Hosein '*Global Challenges for Identity Policies*' was published by Palgrave in 2010 and has provided the academic grounding for subsequent research on digital identity systems around the world. Edgar has also advised governments in Brazil, Chile, Ecuador, India, Jamaica, Japan and Mexico about the political, technological and social challenges of effective identity policies. He has contributed to reports for the World Bank, Omidyar Network and Centre for Global Development.

Anticipation Hub

The Anticipation Hub is a platform to facilitate knowledge exchange, learning, guidance, and advocacy around anticipatory action both virtually and in-person. The platform is hosted by the German Red Cross in cooperation with the International Federation of Red Cross and Red Crescent Societies (IFRC) and the Red Cross Red Crescent Climate Centre

with funding support from Germany's Federal Foreign Office. The Anticipation Hub brings together partners across the Red Cross Red Crescent Movement, universities, research institutes, NGOs, UN agencies, governments, donors, and network initiatives. The Anticipation Hub works towards an effective anticipatory humanitarian system which also informs, inspires and supports collaboration across climate and development sectors to manage risks. The Anticipation Hub aims to support practitioners, scientists and policymakers, to do more anticipatory action, do it better and do it together, to jointly embed a culture of anticipatory action inside and beyond the humanitarian sector. The Anticipation Hub's three strategic priorities are to 1) **stimulate learning, innovation and exchange,** 2) **provide guidance and support** and to 3**) promote sustained policy and advocacy** efforts within and beyond the humanitarian system. Anticipation Hub has developed extensive resources, databases, and briefs on emerging topics in anticipatory action, early action, evidence, triggers, and financing including regional updates that is available on their website.

Anticipation Hub is represented by **Tilly Alcayna,** Co-chair, Working Group on Anticipatory Action and Health

Tilly Alcayna is Co-chair of the working group on Anticipatory Action and Health at the Anticipation Hub and Senior Technical Adviser on Climate and Health with the Red Cross Red Crescent Climate Centre. She works with the Anticipation Hub to strengthen, in a more systematic way, the Red Cross Red Crescent Movement's knowledge exchange, practice and tools on anticipating and preventing negative health and nutritional outcomes. Previously, she worked for Médecins Sans Frontières and was a Research Associate for the Program on Resilient Communities at the Harvard Humanitarian Initiative (HHI). Tilly has conducted research in South Sudan, Colombia, Democratic Republic of the Congo, Nepal, the Philippines, and Lebanon. She is currently pursuing her PhD at the London School of Hygiene and Tropical Medicine in early warning systems for climate sensitive infectious diseases. She holds a Masters in Public Health in Disasters (MPH) jointly from the Universidad de Oviedo, Spain and Karolinska Institutet, Sweden, and the Harvard T.H. Chan School of Public Health. She also holds a Bachelor in Biological Sciences from the University of Oxford. Her research interests focus on human and environmental health, climate change adaptation, socio-ecological systems, and disaster risk reduction.

Internal Displacement Monitoring Centre (IDMC)

IDMC was established in 1998 as part of the Norwegian Refugee Council (NRC) and since then has served as the definitive source of data and analysis on internal displacement. IDMC provides high-quality data, analysis and expertise on internal displacement with the aim of informing policy and operational decisions that can reduce the risk of future displacement and improve the lives of internally displaced people (IDP) worldwide. It has worked with national governments, UN agencies and expert centres to find effective and lasting solutions to internal displacement. Its global data and expertise have served to keep this issue visible on the international agenda, and have shaped some of the world's key global and regional policy frameworks of relevance to this issue, including on humanitarian action, climate change and disaster risk reduction. IDMC data is used for setting targets and measuring progress towards these frameworks. With over twenty years of experience monitoring and analysing internal displacement, often in highly sensitive and hard-to-reach areas, it has developed innovative and specialist tools to expand our global coverage and to continuously improve our understanding of this phenomenon.

Specialist tools

- **The Global Report on Internal Displacement (GRID):** The annual flagship report synthesises the latest statistics, country/situation assessments, thematic and policy analyses. Each year it presents the most up-to-date estimates of new displacements by conflict and disasters, and the total cumulative numbers of IDPs worldwide. The GRID is

the global reference for internal displacement data and analysis and is widely used by policy-makers national governments, UN agencies, international NGOs, journalists and academics.

- **Internal Displacement Updates (IDUs)**: 'Flash' updates on new displacement events across the globe, published daily on an interactive map on IDMC's website's main homepage.
- **Country pages**: An overview of latest figures and analysis of internal displacement per country, including overview of causes and patterns of displacement, priority needs and vulnerabilities, and government policy and operational responses at national and sub-national level.
- **Research papers**: Thematic, country and case study reports exploring different dimensions of internal displacement. Current research priorities include: 1) economic impacts of displacement; 2) urban displacement; 3) displacement in a changing climate; 4) internal to cross-border displacement; and 5) crime and displacement in Central America.
- **Global Disaster Displacement Risk Platform**: An innovative tool based on IDMC's probabilistic model for exploring and visualising disaster-related displacement risk metrics. This platform shows how many people are likely to be displaced per country per year in absolute terms, and in relation to the size of the country's population, in total and for individual hazards. Using this tool, users can also analyse the risk associated with specific displacement events within a given country, such as a cyclone that displaces 100,000 people or an earthquake that displaces 50,000 people.

IDMC is represented by **Vicente Anzellini**, Manager – Global Monitoring and Reporting

Vicente Anzellini leads the global and regional analysis team at IDMC and coordinates the production of the Global Report on Internal Displacement (GRID), regional reports and country profiles. He previously worked for the UN Office for Disaster Risk Reduction (UNDRR) as researcher and policy analyst at the Risk Knowledge Section, based in Geneva. He also supported UNDRR's Regional Office for Africa, based in Nairobi, where he conducted capacity building activities on disaster risk knowledge in over fifteen countries. He also worked in a number of countries across Central and Southern Asia, and the Pacific. Vicente holds a BA in History and Geography from the University of Los Andes (Bogotá, Colombia) and a MA in Human Geography and Migration Studies from the University of Neuchâtel (Switzerland). He speaks Spanish, French and English.

UK Humanitarian Innovation Hub (UKHIH)

Global humanitarian needs are at an all-time high. They will likely continue to rise during the next decade driven by more complex and longer conflicts, and by growing fragility and climate change. The humanitarian system needs to make the best use of its expertise and funding to provide protection and assistance to those that need it, when they need it. Meeting these challenges requires new ways of working - innovation is essential.

The UK Humanitarian Innovation Hub (UKHIH) was founded in 2020 with the aim of solving big humanitarian problems. Hosted by Elrha, its work focuses on accelerating the development of the humanitarian innovation sector, fostering creative and rigorous solutions by actively bringing people together (researchers, humanitarian responders, donors, communities, and the private sector) and using resources strategically to leverage the best expertise and best intent.

UKHIH works to:

• Solve long-standing problems and explore transformational innovation opportunities (especially technological) - Initiating creative research collaborations to push boundaries where creativity is most needed.

• Bring evidence and innovation to bear on new humanitarian crises – Generating emerging learning and evidence in real-time during critical and emerging humanitarian crises that informs strategic decision-making and supports adaptation and innovation.

• Drive research, learning, convening and communication on systemic humanitarian innovation issues – Leading and facilitating learning, networks, and advocacy focusing on understanding, changing, and creating systems that strengthen humanitarian adaptation and innovation.

• Invest in capacity in crisis-affected contexts to do research and innovation on humanitarian problems and opportunities (through the UKHIH Fellowship Scheme)

Current focus areas include satellite technology, collective crisis intelligence and AI, humanitarian surgery and vaccine delivery, alongside rapid response research on new humanitarian crises such as Afghanistan and Ukraine most recently.

UKHIH is represented by **Tonia Thomas**, Research and Learning Lead

Tonia Thomas leads on research and learning strategy for UKHIH. She is responsible for developing and overseeing humanitarian innovation projects, incorporating rigorous research and evaluation principles to address critical humanitarian challenges, and engaging key stakeholders in discussions around adopting innovation practices to improve evidence-based interventions across the sector.

GSMA

The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. GSMA's vision is to unlock the full power of connectivity so that people, industry and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

Mobile for Humanitarian Innovation

The GSMA Mobile for Humanitarian Innovation (M4H) programme works to accelerate the delivery and impact of digital humanitarian assistance. This is achieved by building a learning and research agenda to inform the future of digital humanitarian response, catalysing partnerships and innovation for new digital humanitarian services, advocating for enabling policy environments, monitoring and evaluating performance, disseminating insights and profiling achievements. The programme is supported by the FCDO.

GSMA is represented by **Matthew Downer**, Senior Manager: Research and Policy, M4H

Matthew Downer works on the programme's thought leadership and policy work. He works with a range of partners to generate evidence and understanding around the role, potential and risks of digital technology in humanitarian settings. His research interests include cross-sector partnerships, digital and financial inclusion of crisis affected people, the role

of connectivity infrastructure in crisis settings, amongst other things. Prior to the GSMA, Matthew worked as a Senior Researcher at the British Red Cross and has held several other research, policy, and evaluation positions. He has an MSc in Politics of Population, Migration and Ecology from Birkbeck, University of London, a BA(Hons) in International Relations and Politics from the University of Sheffield, and an Advanced Certificate in Market and Social Research Practice from the UK Market Research Society.

Rim Turkmani, Research Fellow and Director – Syria Conflict Research Programme, Department of International Development, LSE; Member of the Women's Advisory Board to the UN Special Envoy to Syria

Rim Turkmani is a senior policy fellow with the Conflict and Civicness Research Group (CCRG) at the London School of Economics and Political Science. She is the research director of the Syria team at CCRG, the principal investigator of the research project *Legitimacy and citizenship in the Arab world* and a researcher at the Peace and Conflict Resolution Evidence Platform (PeaceRep). She is member of the LSE Middle East Centre Academic Committee and is a member of the Women's Advisory Board to the UN special envoy to Syria. Her research work focuses on constitutionalism and legitimate governance in the Middle East and local conflict and peace drivers. She pioneered new methods in collecting data in conflict zones in MappingSyria.org project and 'Crowd-sourcing Conflict and Peace 'Events' in the Syrian conflict' which produced a detailed database of instances of violence and peace-making.

Elrha

Elrha supports research and innovation to equip the humanitarian community with the knowledge of what works in order to ensure effective and efficient humanitarian response for affected communities. It has supported more than 200 world-class research studies and innovation projects, championing new ideas and different approaches in order to evidence what works in humanitarian response. It works to transform these insights from evidence-based knowledge into practical tools and guidance for humanitarian responders to apply in some of the most difficult situations affecting people and communities. It identifies and prioritises the most pressing problems within humanitarian response and plans the research and innovation approaches needed to tackle them; invests in the right people to research, explore, develop, and test the solutions to these problems; creates and shares practical tools and guidance based on the evidence of what works; and empowers the humanitarian community to adopt what works.

Elrha is represented by **Cecilie Hestbaek**, Head – Humanitarian Innovation Fund

Cecilie leads Elrha's Humanitarian Innovation Fund (HIF) programme, which supports problem-led, responsible and impactful humanitarian innovation. Cecilie has over a decade of experience working with research and innovation across the private, public and voluntary sectors. Before joining Elrha in 2016 she advised charities and funders on evidence, strategy and innovation at UK think tank and consultancy NPC, and prior to this she worked with environmental technology innovation in Denmark. In her time with Elrha, Cecilie has been part of doubling the HIF's size and shaping the programme's focus on technical problem areas alongside the testing of systems approaches to building innovation skills and capacity in the humanitarian system. Cecilie is particularly interested in how humanitarian innovation can become more responsive to the needs of people affected by crisis and how it can become a vehicle for participation and accountability in the sector.

Ben Grazda, Independent

Ben spent four years working for humanitarian organizations (International Rescue Committee and Mercy Corps) in Kenya, Nigeria, Iraq, and Syria. Prior to that, he worked at the US Senate's Homeland Security and Governmental Affairs Committee and the Committee on Rules and Administration. He has also worked as a communications assistant at Sisi ni Amani, a local NGO in Kenya that worked to combat disinformation over SMS during the country's 2013 election, and as a researcher at the Woodrow Wilson Center for Scholars focusing on US budget policy. He completed his MSc in Conflict Studies in the LSE's Department of Government, where his research focused on the weaponisation of social media. He currently works as Project Manager of The Signals Network, a whistleblowing organisation.

Anulekha Nandi, Information Systems and Innovation, LSE

Anulekha Nandi is a Doctoral Researcher in Information Systems and Innovation at the LSE where she studies the design and development of humanitarian technologies. She works as an ad-hoc Parliamentary Researcher on technology, preparedness, and resilience. She has previously worked across research, policy, and practice in ICT4D (information and communication technologies for development) and digital rights in India. She was a civil society stakeholder representing India for the United Nations Secretary General's High-Level Panel for Digital Cooperation, as well an organisational representative at the Global Network Initiative. Anulekha's prior experience includes leading multi-year projects on business and human rights and corporate accountability, consultancies on online child protection, digitisation of public services and access to social protection, and technology and human rights. She has an MSc in Media, Communication and Development from LSE, and a Diploma in Cyber Law from the Government Law College, Mumbai and Asian School of Cyber Laws.

In conversation with Jonathan Barden MBE

Jon has over three decades of experience in humanitarian response including medical emergencies. Following a decade working in Afghanistan, Jon lived and worked in Sudan and Sri Lanka and other conflict settings. On returning to the UK, his work with HelpAge took him to the 2010 Haiti earthquake among others. He then started working for DFID where he helped build and lead the UK's Emergency Medical Teams and field hospitals and for several years was the UK government representative to WHO. He was the UK staffing lead for the DFID Ebola Crisis for which he received an MBE. After DFID he worked for the David Nott Foundation on courses for surgeons in war zones. He now consults for the Humanitarian Surgery Initiative at the Royal College of Surgeons of England.

Jon was supposed to join us for the event but could not due to an emergency deployment so we had this conversation to capture his insights before he left. Below is an edited summary:

On the role of technology and innovation

Jon: There are lot of interesting initiatives like a (virtual reality) headset that was trialled in Yemen that aimed to aid triage of a mass casualty event. However, one of the most crucial considerations for their uptake is the tech infrastructure – like bandwidth – which might not be available in the given location. There was a very useful deployment of drones to prevent vaccine wastage. In countries with bad roads, vaccination teams go out on motorbikes and dispose off unused vaccines at the end of the day. Using drones for vaccine delivery, teams could go to the location and only call in the number of vaccines that were required thereby preventing wastage. So there is huge potential for things like that and it is useful to get different people together in the same room so people like me can share what might be needed when they are in the field.

On predictive technologies and longer lead times

Jon: Longer lead times could help stagger the arrivals process and requests for assistance. The aftermath of humanitarian emergency sees a scramble for resources. Very few emergency teams have their own planes so everyone is after the same planes, on the same routes, as every other aid organisation that needs to ship stuff out. Then everyone is trying to get in, planes need a landing spot, everyone needs customs to clear their stuff, airports get clogged with bigger planes unable to land – all leading to a knock-on effect. Moreover, assistance can only be sent on the basis of official request from countries. There can be a use of diplomatic channels to alert countries to a possibility of an impending crisis to ask whether they would like to have the assistance being offered.

On funding and uptake

Jon: Prepositioning resources are a particularly cost intensive process and it will always come down to whether the government or NGOs that rely on government funding are ready and able to afford a no-regrets policy. The Alert system funded by the Humanitarian Innovation Fund (HIF) was a useful tool for preparedness. It enabled the head office to see the resources and personnel available in field offices so they could only send in the personnel and resources required in case of an impending crises. However, any system, if it is the right one, needs early, significant and visible adoption.

Interviewed by Anulekha Nandi.

Next steps

The event is a part of a wider knowledge exchange and impact project that involves developing a website as a reflective repository of best practices and learnings in this domain and developing and maintaining a community of practice around it.

Website : https://humanitariantechnologyresearch.com (under construction)

Staying connected: https://forms.office.com/r/vuMkmB9aZ2

We will be discussing more about this during the event.

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