DISASTER DISPLACEMENT

A global review, 2008-2018

THEMATIC REPORT

iDMC internal displacement monitoring centre

ACKNOWLEDGEMENTS

This report was made possible thanks to the support of the Platform on Disaster Displacement (PDD) and the generous contribution of the German Federal Foreign Office, which provided the funding.

We would like to thank Atle Solberg of PDD and Susanne Melde of the International Organization for Migration (IOM)'s data analysis centre for their expert review, and the members of PDD's data knowledge working group for their specialist guidance. We would like also to thank colleagues from IOM and the UN Refugee Agency (UNHCR) for their support, particularly Daria Mokhnacheva and Rizki Muhammad of IOM and Isabelle Michal, Erin Bishop, Madeline Garlick and Daniel Macguire at UNHCR.

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Cover photo: A woman returns to her destroyed home in the city of Jérémie, Haiti, after the passage of Hurricane Matthew. Credit: UNICEF/Roger LeMoyne, October 2016

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PLATFORM ON DISASTER DISPLACEMENT
FOLLOW-UP TO THE NANSEN INITIATIVE

DISASTER DISPLACEMENT

A global review, 2008-2018

MAY 2019

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INTRODUCTION

Disasters have triggered around 265 million displacements since IDMC began collecting data on the phenomenon in 2008, more than three times the figure for conflict and violence. Given the scale of the issue, the need to address the risk of displacement associated with disasters has been explicitly recognised in global policy agendas on disaster risk reduction and climate change.

The problem is likely to grow and become more intractable in the future. Weather-related hazards account for more than 87 per cent of all disaster displacement, and the impacts of climate change and the increasing concentration of populations in areas exposed to storms and floods mean that ever more people are at risk of being displaced.

People displaced by disasters face similar challenges to those who flee conflict and violence. Many lose their home, assets and income, and they face insecurity, reduced access to basic needs and services such as water, food, healthcare and education and disrupted social networks.

Despite its scale, there are significant gaps in timely, accurate data on the phenomenon. This limits our collective understanding of the needs of those displaced and how to assist them in re-establishing their lives. It also impedes our ability to assess the full impact of disaster displacement on individuals, communities and countries, and to estimate future risk.

This report is a first attempt to take comprehensive stock of the data collected and published at the global level, and it reveals a number of inconsistencies. These include who is defined as displaced and no longer displaced, and which events and phenomena trigger the collection of data – and which do not.

The report examines who collects disaster displacement data, how they do it and for how long, and highlights good practices as well as gaps. It discusses the availability of data about the scale and location of new displacement, its cross-border dimensions, the characteristics of those displaced and data about returns and other processes that would help to understand when displacement ends. It also looks at the data available to assess the risk of future displacement, and what is missing.

The analysis reveals the most important gaps and provides a roadmap and recommendations for future action. It identifies promising new types of data and means of analysis that have the potential to improve our understanding of this global challenge. Filling the gaps would also be an important step toward addressing displacement as part efforts to implement the Paris Agreement, and in particular the United Nations Framework Convention on Climate Change (UNFCCC)'s Warsaw International Mechanism on Loss and Damage and the work of its task force on displacement, the Sendai Framework for Disaster Risk Reduction and the Sustainable Development Goals.

STRUCTURE OF THE REPORT

Chapter 1 presents data on internal displacement associated with disasters. It shows what has been learned globally since monitoring started in 2008.

Chapter 2 examines what disaster displacement is and why it is important to account for it.

Chapter 3 covers the main metrics and methods used to assess the phenomenon.

Chapter 4 introduces the main stakeholders that monitor disaster displacement at the global level.

Chapter 5 discusses challenges and ways forward and provides recommendations to improve data collection.

1
WHAT WE KNOW

IDMC is the leading source of information on internal displacement around the globe. It has monitored that associated with disasters since 2008 and has compiled the information in its global database.[1] Analysis is also presented in thematic reports and IDMC's flagship publication, the Global Report on Internal Displacement (GRID).[2]

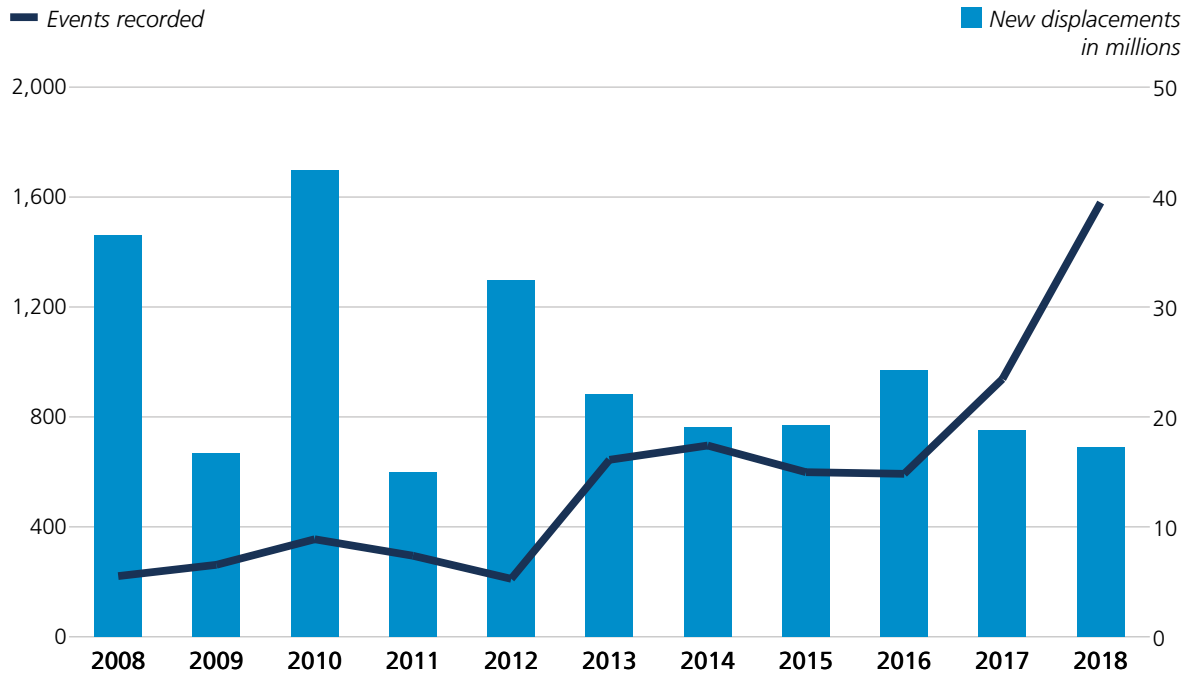
The data collected shows that disaster displacement is a global issue that affects high and low-income countries alike. An average of 24 million new displacements a year were recorded between 2008 and 2018, three times the figure for people displaced by conflict and violence.

IDMC has improved the way it monitors disaster displacement, as figure 1 highlights. The number of verified disaster events it records as having triggered displacement each year has increased significantly since 2016, reaching almost 1,600 in 2018. The total since 2008 is more than 7,000.

Enhanced efforts to collect data and innovative techniques for doing so allow for ever more comprehensive monitoring. This has not led to IDMC producing higher global estimates, but it does reflect better capacity to identify and obtain information about many smaller-scale events that displace only a few people. Data obtained ranges from a single person to 15 million displaced.

Small-scale events that lead to displacement are far more common than larger disasters, but less reported on. Those that occur in isolated, insecure or marginalised areas also tend to be under-reported because access and communications are limited. Our improved detection of displacement, particularly that triggered by small-scale events, is thanks in part to the development of innovative tools such as IDETECT (see chapter 2). Obtaining data and reporting on these events is important because they are mostly driven by people's high

FIGURE 1: Disaster displacement events and global figures IDMC has reported on since 2008



levels of pre-existing vulnerability, unlike larger hazards which may displace everyone in their paths.

The number of new displacements varies considerably from year to year, as figure 1.1 shows. This is because the global figures are largely determined by a handful of mega-events. About half of the global total for 2018, for example, or 9.4 million new displacements, were triggered by just ten events. Some years are clearly outliers. Major disasters in 2010 included floods in China and Pakistan that destroyed millions of homes, severe rains associated with El Niño in Latin America and the Caribbean region and a devastating earthquake in Haiti.

More than 42 million new displacements were recorded, around 18 million more than the average for the last ten years.

Disaster displacement has been recorded in more than 190 countries and territories in the last 11 years (see map 1).

More than 80 per cent of all new displacements between 2008 and 2018, or around 187 million, occurred in the Asia-Pacific region, which includes East Asia and the Pacific and South Asia (see figure 2).

MAP 1: Total new displacements by country, 2008 to 2018

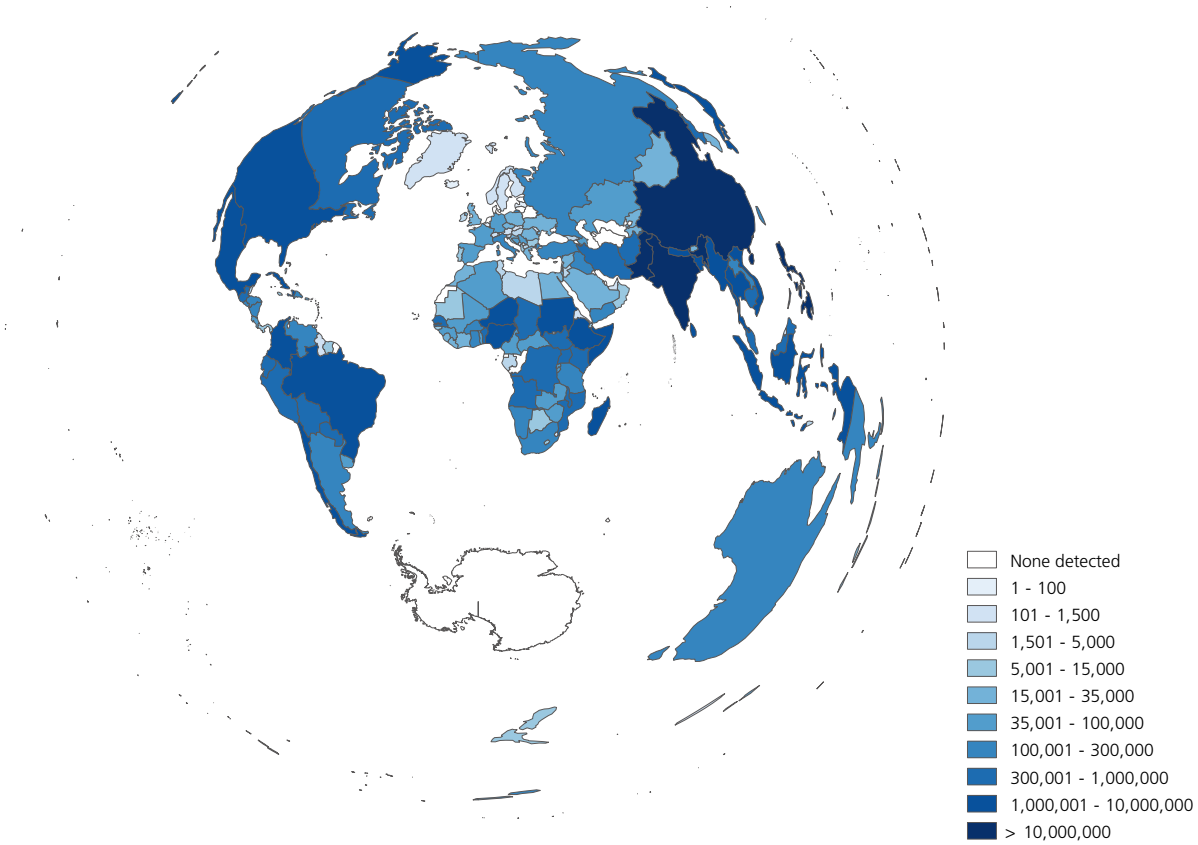
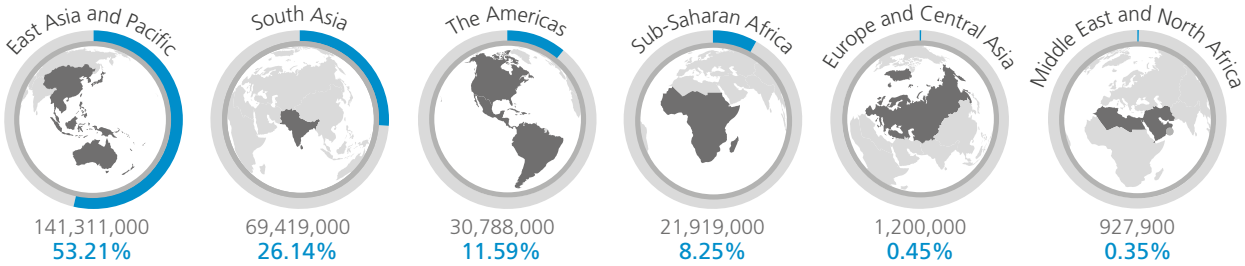


FIGURE 2: Regional distribution of disaster displacement (2008-2018)



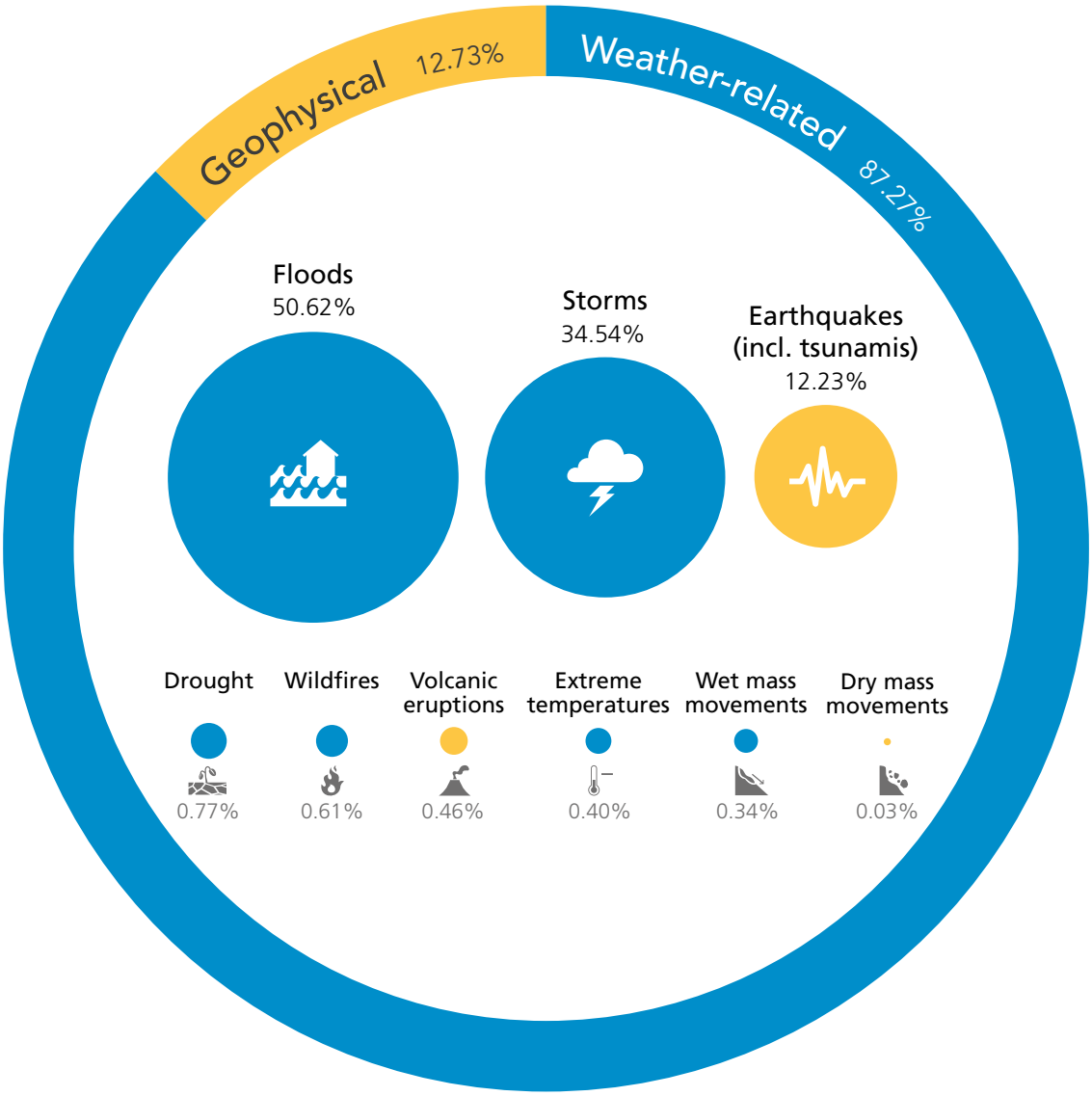
Weather-related hazards accounted for more than 87 per cent of all displacements globally (see figure 3). The impacts of climate change and the increasing concentration of populations in areas exposed to storms and floods mean ever more people are at risk of being displaced in the future.

Many of the displacements triggered by weather-related hazards were pre-emptive evacuations organised by authorities. There is, however, no clear standardisation or classification of terms to differentiate between people who move before, during and after disasters, without which establishing accurate figures is not possible. Nor is it easy to assess the success of early warning systems and other disaster risk reduction measures.

Geophysical events such as earthquakes and tsunamis occur relatively infrequently but have the potential to displace millions. Often devastating, they tend also to result in prolonged displacement and increased vulnerability for all of those affected. Of the 1.5 million people displaced by the 2010 earthquake in Haiti, 62,600 were still living in temporary shelters or accommodations in 2016 and 38,000 in 2018.[3] Despite being infrequent, earthquakes accounted for around 12 per cent of disaster displacements between 2008 and 2018.

IDMC has only been able to obtain information on displacement triggered by slow-onset events such as drought and coastal and riverbank erosion since 2017. Of the many countries that experienced drought in

FIGURE 3: Displacement by hazard categories (2008-2018)



2018, however, displacement was only reported in nine. Afghanistan, Brazil, Burundi, Ethiopia, Iraq, Madagascar, Mongolia, Senegal and Somalia between them accounted for 765,000 new displacements. Riverbank erosion in Afghanistan, Bangladesh, Myanmar and Viet Nam accounted for another 49,000.

IDMC only reports on displacements associated with technological and biological hazards such as industrial accidents and epidemics when these events are triggered by a natural hazard. We reported, for example, on the displacement triggered by radiation exposure in Fukushima, Japan, following the Tohoku earthquake and tsunami in 2011.

Highly populated countries such as China and India may record huge numbers of displacements, but the figures are not so high when viewed relative to their population size. When this factor is accounted for, the data tells a different story of small island states are the most affected. This is because many if not all of their inhabitants are exposed to the same hazards:

- Cyclone Pam displaced 45 per cent of Tuvalu's population in March 2015[4]
- Cyclone Winston affected 40 per cent of Fiji's population, or 347,000 people, and displaced 62,000 in February 2016[5]
- Hurricane Maria affected Dominica's entire population of 71,000 people in September 2017.[6] Based on building assessments conducted by the government in mid-December 2017, IDMC estimate that more than 35,000 people were displaced, and they are likely to remain so, until they fully recover from Hurricane Maria
- Super typhoon Yutu displaced nearly a quarter of the Northern Mariana Islands' population in October 2018[7]

IDMC's figures show that disaster displacement continues unabated, despite variance from one year to the next. Governments and communities still struggle to cope with this challenge and to reduce its risks. Some countries, such as Bangladesh, Fiji, Kiribati and Vanuatu, have included disaster displacement in their national policies, but for most the issue is not subject to specific governance arrangements. Local and national governments' disaster risk management structures at both the local and national level pay it only fleeting if any attention.[8]

2

UNDERSTANDING DISASTER DISPLACEMENT

IDMC's 2019 GRID reveals that there were 17.2 million new internal displacements associated with disasters across 144 countries in 2018. Given the large and growing challenge that the phenomenon represents, and that climate change is aggravating the frequency, severity and impacts of hazards, the importance of accurate and comprehensive monitoring across the world is vital to measure progress or lack thereof in addressing it. This chapter presents the main definitions and considerations required to understand disaster displacement.

WHAT IS DISASTER DISPLACEMENT?

The UN Office for Disaster Risk Reduction (UNDRR) defines a **disaster** as:

> *"A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts."*[9]

Disaster displacement depends on three factors: the intensity of the hazardous event, the exposure of people and assets to it and their vulnerability. The Nansen Initiative's Protection Agenda defines **disaster displacement** as:

> *"Situations where people are forced or obliged to leave their homes or places of habitual residence as a result of a disaster or in order to avoid the impact of an immediate and foreseeable natural hazard. Such displacement results from the fact that affected persons are (i) exposed to (ii) a natural hazard in a situation where (iii) they are too vulnerable and lack the resilience to withstand the impacts of that hazard.*
>
> *It is the effects of natural hazards, including the adverse impacts of climate change, that may overwhelm the resilience or adaptive capacity of an affected community or society, thus leading to a disaster that potentially results in displacement. Disaster displacement may take the form of spontaneous flight, an evacuation ordered or enforced by authorities or an involuntary planned relocation process. Such displacement can occur within a country (internal displacement), or across international borders (cross-border disaster-displacement)."*[10]

The definition is limited to natural hazards, but an adapted version of it "may also apply [...] to disasters triggered by human-made factors such as large-scale industrial accidents".[11]

KEY ASPECTS TO CONSIDER

To arrive at a common understanding of the evidence on disaster displacement, it is first necessary to clarify a number of concepts and terms:

The forced dimension of disaster displacement

The Guiding Principles on Internal Displacement define **internally displaced people** (IDPs) as:

> *"Persons or groups of persons who have been **forced or obliged to flee** or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized State border."*[12]

Disaster displacement is triggered by natural or human-made hazards

UNDRR defines a **hazard** as:

> *"A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation.*
>
> *Hazards may be natural, anthropogenic or socionatural in origin. [...] Hazards may be single, sequential or combined in their origin and effects. Each hazard is characterized by its location, intensity or magnitude, frequency and probability. Biological hazards are also defined by their infectiousness or toxicity, or other characteristics of the pathogen such as dose-response, incubation period, case fatality rate and estimation of the pathogen for transmission."*[13]

Hazards can be sudden-onset events such as earthquakes or slow-onset phenomena such as drought and sea-level rise. The displacement associated with each hazard has specific implications for monitoring, policy-making and operational responses.

Slow-onset hazards

Internal displacement associated with slow-onset disasters and environmental change is a complex and dynamic process in which an area becomes progressively less habitable or livelihoods eroded until a tipping is reached.[14] It is difficult to account for it comprehensively because of the wide range of phenomena, impacts and drivers associated with slow-onset hazards, the types of movement they trigger and the situations in the regions they affect.

One of the main problems is that the critical nature of slow-onset events only tends to become apparent when a crisis point is reached. It may not be useful, because of this, to distinguish between slow- and sudden-onset events that trigger displacement, because slow-onset processes often manifest in extreme weather events and trigger sudden-onset crises.

Slow-onset processes may also contribute to extreme weather events that trigger sudden-onset crises. Sea-level rise leads to bigger storm surges, and drought may cause desertification, which in turn may aggravate flooding by reducing run-off and the absorption capacity of soil.

Key knowledge gaps on the scale of displacement associated with slow-onset events include:

- How many people are at risk of being forcibly displaced by slow-onset hazards and disasters?
- How many new displacements do such events trigger?
- How many people are living in displacement as a result of irreversible environmental degradation and climate change?
- How many of those living in displacement are likely to remain in their country?

Displacement is usually a result of a multitude of inter-connected drivers. Unsustainable economic growth and development practices accelerate climate change and environmental degradation, which in turn may reduce crop yields and access to natural resources, increase conflict over water, land and other resources, and eventually force people from their land and communities.[15]

It is often hard to distinguish displacement from migration, however, because both phenomena share a number of drivers, including increasing hardship and difficulties in generating income. It is also currently impossible to determine precisely how slow-onset events will play out in different parts of the world in the future, or how their impacts will affect the scale and patterns of displacement involved.

More research is needed to better contextualise and understand this type of displacement, particularly at the local, national and regional levels, where slow-onset impacts may deviate from broader trends identified in global analyses. The existing literature is consistent, however, in demonstrating that slow-onset environmental factors are just one of a range of considerations that influence people's decision to move until a tipping point is reached. They are often not even the main factor, which means there are a variety of policy and investment options to reduce risk and respond effectively.

System dynamics and agent-based models offer the most promising approaches to assessing the risk and impacts of displacement associated with slow-onset hazards. IDMC has developed models for drought-re-

lated displacement risk for pastoralist communities in the Horn of Africa.[16] More investment in developing similar models with the required data would enable more comprehensive assessments of displacement risk associated with slow-onset and multi-causal events.

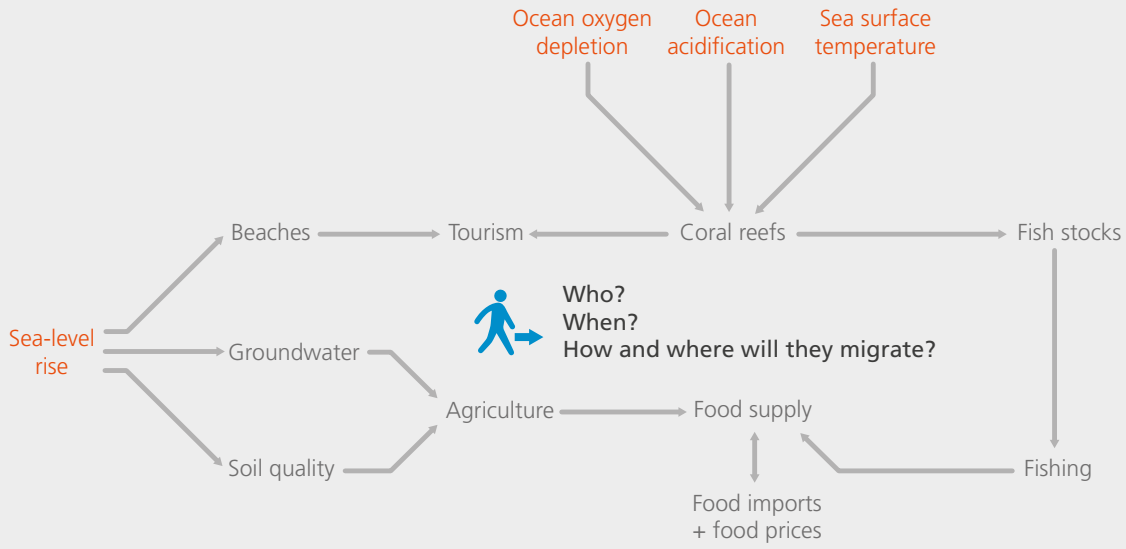
New data sources, including satellite imagery, mobile phone data and most importantly better access to information derived from Earth observations and climate models, will improve the quality of information about displacement associated with slow-onset phenomena.

BOX 1. INTERCONNECTIVITY OF SYSTEMS

Based on system dynamics and agent-based modelling approaches, IDMC is mapping the ways in which policy responses and long-term investments determine displacement risk, which also indicates the circumstances under which displacement is likely to occur and why. This will enable us to model displacement risk scenarios for different slow-onset situations and policy interventions.

The Intergovernmental Panel on Climate Change (IPCC)'s fifth assessment report (AR5) confirms that climate change is a major driver of sea-level rise, ocean acidification, increases in sea surface temperature and depletion of oceanic oxygen, which will affect low-lying island communities severely.[17] Given the threat this poses to people's homes and other infrastructure and the displacement it is expected it to trigger, we are using system dynamics and the ways in which factors interconnect to understand the causes and ultimate trigger of displacement. An example of this process is shown and described below.

FIGURE 4: Climate change impacts on low-lying small island states



Some of the **interconnectivity** in this scenario works as follows. As climate change increases temperatures around the world, sea surface temperatures increase and oxygen levels in the oceans are reduced. This kills coral reefs, which reduces tourism income and also fish stocks, making it harder for people to make a living from traditional activities. At the same time, sea-level rise intrudes on beaches, driving visitor numbers down further. It also harms groundwater and soil quality, and agriculture suffers, meaning that both land and sea provide less food. Faced with a loss of income, growing threats to their homes and increasing difficulty in growing or catching food to eat, people may conclude that leaving is their only option. They become displaced by a range of factors that combine to make remaining at home increasingly difficult to the point of impossibility.

The inclusion of questions in national censuses and other surveys will also help to increase data and insight on such events. The more data we have about slow-onset events and their impacts on livelihoods, the more accurate our scenarios and models will become.

Sudden-onset hazards

Hazards that strike suddenly, or whose occurrence or impacts cannot be predicted far in advance, trigger rapid-onset disasters. Floods, cyclones and earthquakes are examples of sudden-onset events, which are much easier to monitor than slow-onset events.

To capture displacement and establish an understanding of the phenomenon as comprehensively as possible, IDMC conducts event-based monitoring when data is available to do so. In other words, an "event" is the unit of analysis we use to track and record displacement associated with disasters triggered by natural hazards. This enables us to produce disaggregated analyses based on the date of displacement and its triggers, causes and duration.

In doing so, we aim to record information on the date of the displacement event, its scale measured in terms of the number of new displacements, the hazard involved, its impacts measured in terms of the number of homes destroyed. Where possible, we also capture information about where people were displaced from and where they are sheltering.

Different forms of disaster displacement

When a disaster strikes, people may be forced to move for their physical safety, or because of damage and destruction wrought on homes and critical infrastructure. The duration of displacement depends on the severity of the disaster's impacts and affected communities' social and economic capacity to recover. Humanitarian and development interventions including shelter provision, resettlement programmes and projects to facilitate IDPs' return or encourage their local integration play a part in determining whether durable solutions are achieved.[18]

Many people are also forced to move when authorities order them to evacuate, before a cyclone makes landfall for example. Governments may also relocate people away from hazard-prone areas. Such initiatives are usually intended as long-term measures to reduce disaster risk, but they also disrupt people's social and economic networks and often take longer than planned. Involuntary resettlement carries impoverishment risks that need to be reduced to make such interventions sustainable for those displaced.[19]

Displacement can be internal or cross-border

Most people displaced by disasters remain in the country where the disaster occurred, becoming IDPs. The Nansen Initiative's Protection Agenda, however, notes that some forced movements may include people crossing a border.[20] The legal and policy implications are different depending on the type of movement, because those displaced across borders may not be guaranteed the same protection as those who fled within their own country.

The duration of displacement

Some evacuees may be able to return immediately or relatively quickly after the hazard in question has abated, but other people may be displaced for months or even years, depending on the damage, destruction and disruption wrought. The duration of displacement must be considered when planning and implementing responses (see box on Haiti and the Philippines). A better understanding of protracted displacement associated with disasters is needed.

The severity of displacement

All of the factors mentioned above also influence the severity of displacement's impacts on those affected, as do people's pre-existing vulnerabilities. The same vulnerabilities and the ways in which they increase following a disaster help to determine the extent to which those displaced are able to achieve durable solutions.

BOX 2. IDETECT – THE INTERNAL DISPLACEMENT EVENT TAGGING AND CLUSTERING TOOL

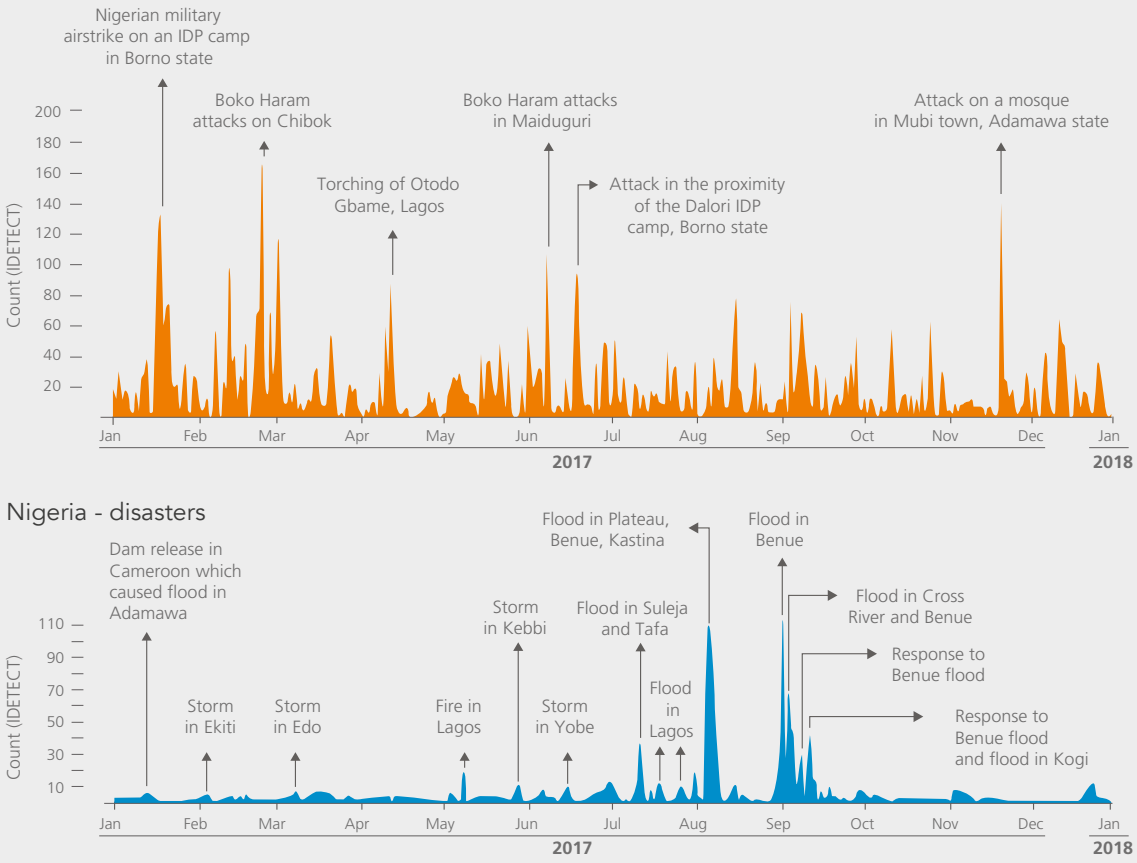
New tools, technologies and data sources represent an opportunity to improve data collection. We aim to ensure that our information gathering and management systems keep pace with and take full advantage of such advances, as laid out in our strategic plan for 2015 to 2020.[21]

One example is IDETECT, which mines huge news datasets and uses natural language processing and machine learning algorithms to extract information about the number of people displaced and their location, and to classify reports by type of displacement. IDETECT works in real time, meaning that we are able to collect and analyse a wide array of information and report on a broad range of displacement incidents in a timely manner.

IDMC's global displacement monitoring platform contains data from thousands of sources, which it is possible to explore, filter and validate. It makes it easy to identify new displacement events reported, and to visualise and compare figures from a range of independent sources.

The timeline in figure 5 shows the volume of data that IDETECT extracted from local and international sources about conflict and disasters in Nigeria in 2017 and how it was correlated with the main events that triggered displacement.

FIGURE 5: Displacement facts and key events Nigeria captured by IDETECT in 2017



BOX 3. UNDERSTANDING PROTRACTED DISASTER DISPLACEMENT AND SEVERITY IN HAITI AND THE PHILIPPINES

| HAITI

The 2010 earthquake in Haiti triggered more than 1.5 million new displacements. Many of the consequences of the disaster remained unaddressed, influencing displacement patterns and impacts when subsequent disasters hit the country. IDMC highlighted this in 2012, when it described how cumulative impacts increase IDPs' and host communities' vulnerability and fuel further cycles of displacement.[22]

Haiti has been hit by at least nine significant floods and eight major storms since the 2010 earthquake. The most intense were hurricane Sandy in 2012, hurricane Matthew in 2016, and hurricanes Maria and Irma in 2017. Information about people who remain displaced long after initial humanitarian responses have ended is limited, which makes it difficult to establish a comprehensive overview of protracted displacement in the country. The UN, however, has said that around 2.2 million vulnerable people, or about 20 per cent of the Haiti's population, are still in need of humanitarian assistance.[23]

Food insecurity and a cholera epidemic that has claimed more than 9,700 lives have been among the main challenges. Legal uncertainty over property rights is also a major obstacle to improving disaster responses and reducing the risk posed by future disasters. Any effort to establish formal land titles depends on the broader institutional structure for property rights. Seventy-two per cent of buildings were located in flood-prone areas as recently as 2015, and more than 74 per cent of the country's urban population lives in informal settlements, and the government lacks the financial and human capacity to prepare, respond and recover from disasters.[24]

| THE PHILIPPINES

Tropical storm Haiyan, known in the Philippines as Yolanda, made landfall on 8 November 2013. One of the strongest typhoons on record, it tracked across at least nine regions, affecting more than 14 million people of whom four million were displaced. It also devastated infrastructure, agriculture and local economies.[25] More than 1.1 million homes were severely damaged.[26]

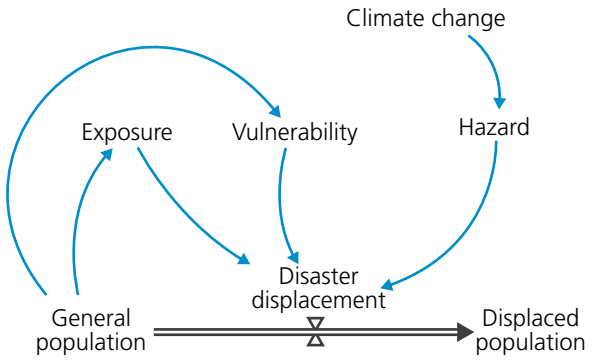
Shortly after the typhoon, the majority of those displaced returned to their areas of residence even if their homes had been severely damaged or destroyed.[27] The scale and severity of the event and its impact on infrastructure and livelihoods were among the factors that prolonged the displacement of thousands of people for several years. Around 880,000 people were thought to still be living in temporary and transitional shelters as of 2015, and the National Housing Authority was still rebuilding homes in 2017 as part of its resettlement and reconstruction programme in affected areas.[28]

Whether displacement is a preventive measure to avert potential loss of life or a reaction to the impacts of a disaster, the indicators needed to identify and monitor it are specific to each form of movement (see figure 6). These indicators are related to the three phases of the disaster management cycle, meaning that the systematic collection of displacement data should be integrated into operational disaster preparedness, response and recovery systems.

WHY IS DISASTER DISPLACEMENT IMPORTANT?

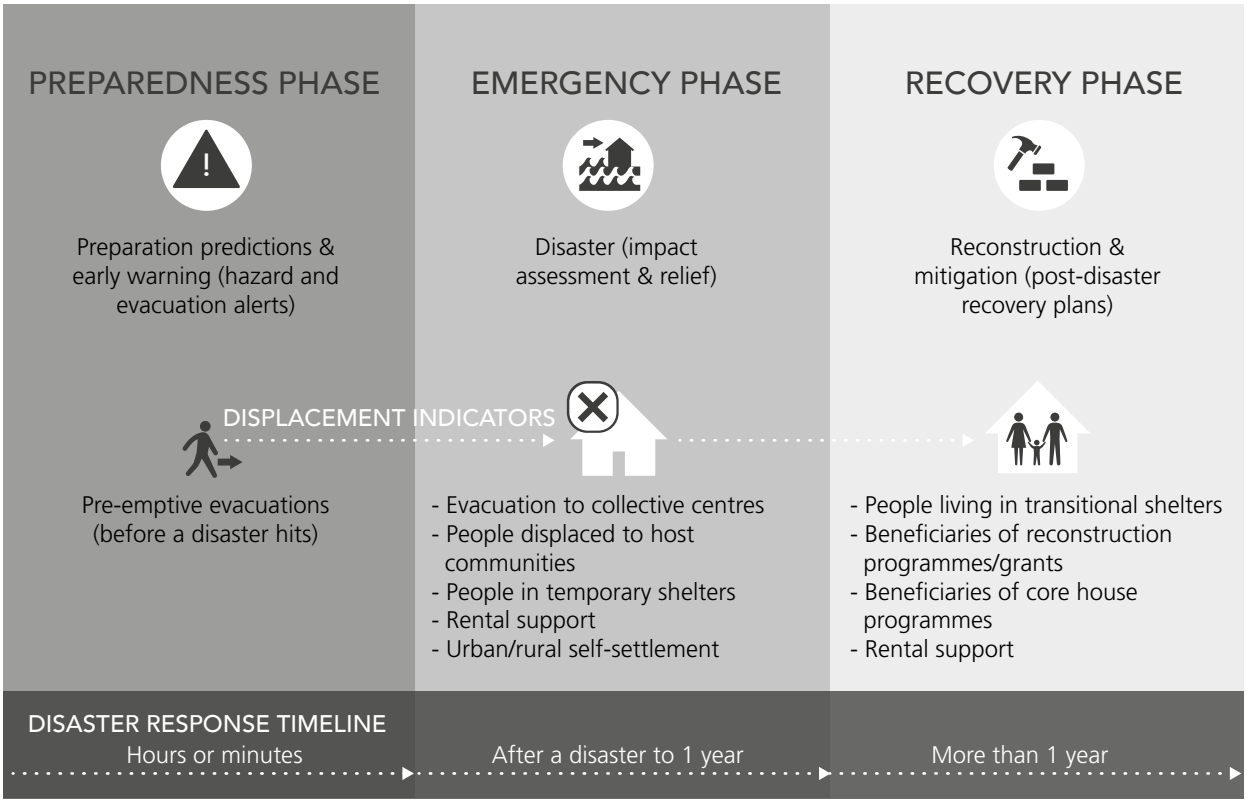
Disasters triggered over three times more displacements than conflict and violence between 2008 and 2018, and climate change is expected to increase their number, most notably by making weather-related hazards more frequent and intense. The risk of future displacement will be determined by how policies and processes influence peoples' exposure and vulnerability to hazards (see figure 7). Policies to address the challenge have been developed at both national and global level, and will be vital in reducing its risks and impacts.

FIGURE 7: How climate change, demographic and socioeconomic factors influence future displacement risk



IDMC compiled figures for new displacements associated with drought for the first time in 2017. It arrived a figure or more than 1.3 million, or seven per cent of all disaster displacement recorded that year. Displacement associated with both sudden and slow-onset disasters is likely to increase, which has the potential to erode development gains. Unless investments are made to reduce the phenomenon, it will also continue to represent a significant obstacle to sustainable development.

FIGURE 6: Indicators of internal displacement before, during and after disasters



INTERNATIONAL POLICY IS KEY TO ADDRESSING DISPLACEMENT

Global agreements on disaster risk reduction such as the Hyogo Framework for Action 2005–2015 and the Sendai Framework for Disaster Risk Reduction 2015–2030 have promoted and significantly increased efforts to reduce disaster risk in general, and the Sendai framework recognises the importance of addressing displacement risk in particular.[29]

The 2030 Agenda for Sustainable Development includes dedicated target 13.1 to "strengthen resilience and the capacity to adapt to climate related hazards and natural disasters in all countries". Progress against it is meant to be monitored using the number of deaths and people missing as a result of disasters, and the number directly affected. Another target to be monitored using the same indicators is to strengthen the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to disasters. Unlike the 2030 Agenda, however, the New Urban Agenda does not have specific metrics to assess urban displacement.[30]

The UNFCCC's Warsaw International Mechanism on Loss and Damage associated with Climate Change Impacts has established a task force on displacement, which recognises the need to "avert, minimise and address displacement related to the adverse impacts of climate change".[31] A key pillar in doing so will be to better understand the scale, nature, impact and future risk of the phenomenon, as recognised in the recommendations adopted at the 24th Conference of the Parties (COP24) in 2018.[32]

The New Urban Agenda set in 2016 addresses internal displacement in more detail. It acknowledges that the phenomenon presents challenges in urban settings, but also notes that IDPs make significant social, economic and cultural contributions to towns and cities. It offers governments support in encouraging participation from all parts of society, including IDPs in identifying potential solutions and implementing locally appropriate policies. It commits to promoting livelihood opportunities and full, productive and decent work, and paying special attention to IDPs' needs, particularly those of the poorest and most vulnerable. It also seeks to improve the availability of affordable housing and tenure security.[33]

The Grand Bargain signed by donors and humanitarian aid organisations in 2016 sets out 51 commitments to better serve people in need. Of particular interest, the parties commit to "invest in durable solutions for refugees and internally displaced people and sustainable support to migrants, returnees and host/receiving communities, as well as for other situations of recurring vulnerabilities". Other commitments are also relevant to disaster displacement, such as 5.3.a, under which the signatories agree to "share needs assessment data in a timely manner, with appropriate mitigation of protection and privacy risks". Progress against each commitment is assessed every year, with the aim of encouraging more direct action and collaboration between the parties.[34]

The Global Compact for Safe, Orderly and Regular Migration, also known as the Migration Compact, recognises the nexus between disasters triggered by natural hazards, including the adverse effects of climate change, and migration. It also addresses the challenges of human mobility related to disasters and climate change.[35]

Despite these advances, however, global monitoring mechanisms are yet to be included in the growing disaster displacement policy agenda. The Sendai framework, for example, does not include specific global indicators for countries to monitor and report on the phenomenon. This represents a missed opportunity. It impedes meaningful comparisons and learning between countries, and makes it more difficult to highlight synergies between the different frameworks and their targets. Internal displacement seems to be an afterthought in the main global agreements, but there are still opportunities to better monitor its impacts and reduce its risks.

For that to happen, we cannot act at the global level alone. Disasters are essentially local phenomena, so the role of local authorities and national governments is key. The number of people displaced needs to be counted, their conditions examined and the duration and severity of their displacement monitored, and this information needs to be made available to local governments.

UNDERSTANDING THE IMPACTS OF DISASTER DISPLACEMENT

Internal displacement has impacts on economies and societies that go beyond the immediate phases of preparedness, emergency and recovery. Systemic risks and impacts affect the full development spectrum of countries and communities before, during and after disasters.

Displacement can save lives

Effective early warning systems are vital in reducing the number of people exposed to dangerous and often life-threatening hazards. This reminds us that displacement is not always a negative outcome. Pre-emptive evacuations save lives, and they are an effective resilience measure. The Sendai framework emphasises the importance of regular disaster preparedness, response and recovery exercises, including evacuation drills, training and the establishment of area-based support systems to ensure rapid and effective responses to displacement, including "access to safe shelter, essential food and non-food relief supplies, as appropriate to local needs".

Sendai's priority 1 calls on governments to help communities understand the risk of disasters by disseminating location-based information, raising public awareness of the importance of disaster risk reduction, and promoting disaster risk knowledge, including prevention, mitigation and preparedness.

People living in areas exposed to hazards must understand their risk of displacement and the potential action they can take to mitigate its negative impacts on their lives and property (see box on Cuba and Japan). People at risk of displacement need to know the perils they face in order to make informed decisions about how to reduce their exposure and vulnerability. Improving people's knowledge of their own risk also encourages them to comply with evacuation warnings.

Sendai priority 4 sets out how to prepare for and respond effectively to disasters:

"The steady growth of disaster risk, including the increase of people and assets exposure, combined with the lessons learned from past disasters, indicates the need to further strengthen disaster preparedness for response, take action in anticipation of events, integrate disaster risk reduction in response preparedness and ensure that capacities are in place for effective response and recovery at all levels."[36]

In 2018, more than 146,000 new displacements were recorded in Japan, mostly evacuations. Government-led evacuation centres supported those displaced, including elderly and disabled people. Photo: Japanese Red Cross Society, July 2018

BOX 4. FOLLOWING EARLY WARNINGS: EXAMPLES FROM CUBA AND JAPAN

Cuba suffered severe drought and was struck by hurricane Matthew in 2016. While it was responding to and recovering from the impacts of both, hurricane Irma battered the island for more than 70 hours in September 2017, affecting 12 of the country's 15 provinces. More than 158,000 homes were damaged, more than 16,600 partially collapsed and about 14,600 totally collapsed.[37]

Cuba's experience is also an example of resilience. All Cubans are taught from childhood how to behave when hurricanes approach. Disaster preparedness, prevention and response are part of the national curriculum and people of all ages are regularly trained, including participation in drills and simulation exercises. The country's civil defence authority and meteorological institute are the pillars of its disaster risk management system, which involves all citizens. Every individual has a role to play in the emergency plan, from shelters to communications and transport.[38] Around 1.8 million people were evacuated to temporary shelters and host families before and during Irma. Despite the widespread damage to property, people were safe, demonstrating that displacement can be a positive outcome.

Recent experiences in Japan tell a different story. Successive storms and torrential rain in June and July 2018 led to widespread flooding and landslides across much of the south-west of the country. The government issued evacuation orders for more than two million people in 19 western prefectures between 28 June and 8 July in anticipation of typhoon Prapiroon. Less than three weeks later, the same region was struck by typhoon Jongdari.

Of the people surveyed in Hiroshima city about their decision to evacuate, however, only 3.6 per cent said they had done so when the rains began. Some who failed to do so were trapped by rapidly rising waters and landslides. Prapiroon became Japan's deadliest weather-related event in decades.

When typhoon Jebi made landfall in August, responsiveness to pre-emptive evacuation orders was still low. According to studies conducted in Kobe prefecture after the disaster, less than 10 per cent of those ordered to evacuate did so. Jebi was the most powerful typhoon to hit Japan in 25 years. It caused at least ten deaths and injured many more people. The magnitude of the disaster raised awareness about the importance of pre-emptive evacuations among affected communities. About half of those surveyed after the disaster said they would evacuate if they received similar warnings in the future.

Impacts on economies

The impacts of displacement on those displaced and their host communities create significant costs at the local and national level, and in cases of large-scale and protracted displacement, even the regional and global level.

The phenomenon affects economies in many different but connected ways. Some impacts are direct if, for example, a municipality rents out hotel rooms to accommodate evacuees during a hurricane. Others are indirect if a local authority has to reallocate some of its budget away from support for small businesses or infrastructure improvements to fund evacuations.[39]

Impacts may be felt in the short term, if the capacity of health centres in a host community has to be increased to care for newly arrived IDPs, or in the longer term, if investment in new hospitals is needed to cater for the growing population of a host community when displacement becomes protracted. IDPs themselves may face impacts at the time of their displacement, when they have to pay for transport and temporary lodgings, or later when they have to accept a lower-paid job in the saturated labour market of their host area.

Some impacts on IDPs and host communities are tangible, such as when crops and livestock are lost in a disaster or a host community's supplies are exhausted because of the increased population. Others, such as

months of lost education, are intangible (see box on lost productivity due to internal displacement).

As part of IDMC's research programme on the economic impacts of internal displacement, we have developed a new methodology to estimate these costs. We used it in 2018 to calculate that the economic impact of displacement associated with flooding in Somalia was around $19 million for 287,000 people displaced.[40] The figure for 500,000 people displaced by with various climate-related events in Ethiopia, including drought and floods, was even higher – almost $170 million.

All stakeholders involved in preparing for and responding to disasters, including the displacement they trigger, need to improve their understanding of the latter's broader and longer-term impacts. Doing so would better inform the development sector about where and how to engage in displacement crises to reduce their impacts on IDPs, host communities and national economies.

BOX 5. LOST PRODUCTIVITY BECAUSE OF INTERNAL DISPLACEMENT

One approach to estimating the productivity losses associated with internal displacement is to postulate that displaced workers are unable to pursue their usual economic activity for the duration of their displacement. Lost production is calculated by combining the number of displaced workers, the length of time they are displaced and an indicator such as GDP per capita. Given that severely damaged homes take longer to repair or rebuild, consigning their inhabitants to longer periods of displacement, the extent of housing destruction can be used to assess the duration of displacement. It is otherwise rarely reported.

The following two case studies serve as examples of IDMC's calculations.

| Nepal, earthquake, 2015

The earthquake that struck the Nepalese region of Gorkha in April 2015 killed nearly 9,000 people, injured more than 16,000 and destroyed hundreds of thousands of homes across the country. More than 2.6 million people were displaced. In addition to the human suffering it caused, the magnitude 7.8 quake had an immediate economic impact estimated at as much as half of Nepal's $20 billion GDP. The cost of IDPs' lost productivity was around $406 million.[41]

| Cuba, hurricane Ike, 2008

Hurricane Ike, one of the most destructive hurricanes in Cuba's history, struck in September 2008. The category four storm brought winds of more than 200 kilometres per hour, damaged more than 300,000 homes and destroyed 200. It also killed seven people in Cuba, 74 in Haiti and 113 in the US.

Many more people would have been killed or injured in Cuba had it not been for the authorities coordinating mass evacuations as Ike approached. More than 2.6 million people, a quarter of the island's population, were moved away from the path of the storm in the days before it made landfall. Around 80 per cent stayed with friends and relatives, the remainder in evacuation shelters.

Ike is thought to have been the costliest storm in Cuba, with material damages alone put at around about $7.3 billion, the equivalent of 12 per cent of the country's GDP. Infrastructure and agriculture were heavily affected. The cost of IDPs' lost productivity was an additional $131.7 million.[42]

3
DATA AND METADATA

Disaster displacement is a complex phenomenon that is difficult to capture via data. The main challenges range from a lack of interoperability and coordination among collectors and a lack of agreement on what the key metrics and definitions are, to establishing when displacement starts and ends, who is displaced and for how long. Significant progress has been made over the last decade in terms better collaboration, more accessibility and higher quality data, but there is still much room for improvement.

Countries and sources do not use the term "displaced" consistently when they collect data or report on disaster displacement. People displaced by floods in 2015 were referred to as "homeless" in Madagascar and "moved" in Iraq. Data collectors also often include people displaced among those "directly affected". This conflation is a concern because it may result both in confusion and inaccurate data. It is true that displaced people are among those directly affected, but not all of the latter will have been displaced.

Disaster displacement data falls into two broad categories, stocks and flows. As the UN Statistical Commission's Expert Group on Refugee and IDP Statistics (EGRIS) notes, the production of statistics on displaced people "requires a clear distinction between stocks and flows".[43] Making this distinction remains a challenge, however, for national statistics offices and other data collectors.

EGRIS defines a displacement stock figure as "the total number of people who match an established definition of being internally displaced in a determined location at a specific moment".[44] It defines displacement flows as "the number of people who meet certain criteria within a particular time period, (as opposed to a specific reference date), and whose status as a member of the population in question changes as a result."[45]

Displacement flows describe the processes that lead to people being counted as IDPs, known as inflows, or no longer counted, known as outflows. The number of new IDPs identified between two specific dates following the event that triggered their displacement is an example of an inflow, which IDMC refers to as "new displacements". IDPs who flee abroad or return home are examples of outflows.[46]

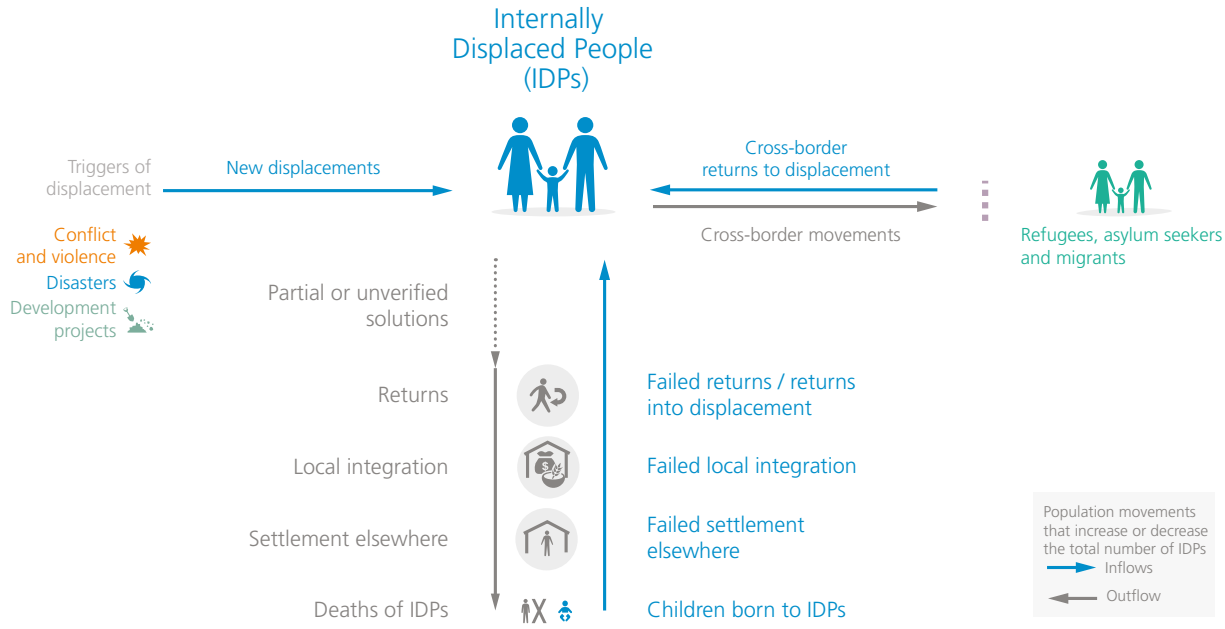
IDMC'S DATA MODEL

IDMC published a unique data model in 2015, which is designed to establish a comprehensive and accurate picture of displacement at any given point in time. Figure 8 is a simplified version and illustrates the main stocks and flows needed to account for the number of people displaced in a given situation. The model can also be used to record, aggregate and report on all incidents of new displacement during the year as information becomes available.

The model captures inflows: people newly displaced, children born into displacement and IDPs who tried but failed to return, resettle or integrate locally and became newly displaced again. It also captures outflows: IDPs who have achieved durable solutions, crossed borders or died.

Accurately measuring disaster displacement stocks and flows presents significant challenges. Return flows are a particular concern because they are often implied rather than directly observed. Comprehensive stock figures are difficult to obtain in real time and often only account for people displaced to official shelters and evacuation centres. This lack of timely and comprehensive data often leads the media and even government authorities to report wildly inaccurate figures that are subsequently revised as more observational data is collected and verified.

FIGURE 8: Internal displacement data model depicting main stocks and flows



The flow of new displacements feeds into the stock, or total number of IDPs at a given point in time. The latter figure increases or decreases over time based on net flows. When new displacements outnumber returns and other outflows, it goes up. When the outflows are larger, it goes down.[47] When we refer to the cumulative number of people displaced by an event or over the course of the year, it represents the aggregate number of new displacements.

FLOWS

Displacement flows associated with disasters include a range of human mobility phenomena. We use the definitions below when estimating and reporting on the different inflows and outflows:

- **New displacements, an inflow:** We commonly refer to new displacements as "incidents" of displacement. This is because the figure may sometimes include the same individuals being displaced more than once. Given the way displacement data is collected, it is often impossible to determine whether those counted have been displaced for the first time or their movement is a case of repeated or secondary displacement.

- **Pre-emptive evacuations, an inflow:** Pre-emptive evacuations refer to displacement undertaken with the intention of avoiding or mitigating the impacts of an anticipated hazard. They involve arrangements established in advance to move people temporarily to safer places before a hazard strikes.[48]

- **During and post-disaster evacuations, an inflow:** UNDRR's terminology, which aims to establish a common understanding and usage of terms related to disaster risk reduction, defines during and post-disaster evacuations as "moving people and assets temporarily to safer places before, during or after the occurrence of a hazardous event in order to protect them".[49]

- **Cross-border displacement, an outflow and inflow:** The forced movement of people across borders, irrespective of their legal status in the countries they enter. Cross-border displacement can be into a neighbouring country or one further afield and may involve air travel. The receiving country is known as the host country. When IDPs are displaced across a border the stock of IDPs decreases, but if they return to a situation of internal displacement in their country of origin or habitual residence, it increases.

- **Returns, an outflow:** When displacement is internal, return is defined as IDPs' movement from their place of displacement to their former home or place of habitual residence. In the case of cross-border displacement, it signifies movement from

the host country back to the country of origin or habitual residence.

- **Resettlement, an outflow:** Displaced people who successfully settle in a new location in a process that is voluntary and informed are no longer considered IDPs, provided they do not require further assistance to address any remaining needs related to their displacement.

- **Local integration, an outflow:** IDPs who become part of the community where they are sheltering or have taken up residence.

- **Births and deaths, demographic flows:** People who die while in displacement are removed from the stock of IDPs. Children born to IDPs are added.

STOCKS

IDMC's stock figures refer to the number of people living in displacement as of 31 December each year, whether in camps, informal settlements, official shelters, rented accommodation or with friends or relatives. They may also include IDPs who have attempted to return, resettle elsewhere or integrate locally but have been unable to achieve durable solutions. The following definitions are used when analysing data related to stock figures.

- **Returnees:** IDMC tries to distinguish between returning refugees and returning IDPs in its data gathering and reporting. In internal displacement situations, returnees are former IDPs who have returned in safety and dignity to their former home or place of habitual residence, based on a voluntary and informed decision. They are said to have achieved durable solutions when they no longer have specific assistance and protection needs linked to their displacement and can exercise their human rights without discrimination that results from it. This also applies to IDPs who have settled elsewhere or integrated locally. IDMC considers those who do not meet these criteria to be IDPs, but due to a lack of data it remains a challenge to implement this in terms of our accounting.

- In the case of cross-border movements, returnees include returning refugees, asylum seekers and migrants who have returned voluntarily or involuntarily to their country of origin. Those unable to go back to their former home or place of habitual residence for one of the reasons set out in the Guiding Principles or to integrate elsewhere are counted as IDPs. Those forced to flee or leave their home or place of habitual residence again after their return for one of the reasons set out in the Guiding Principles are also considered IDPs.

- **IDPs resettled elsewhere:** IDMC characterises people as resettled elsewhere when they have made an informed and voluntary decision to settle somewhere other than their place of former habitual residence or place of displacement and have achieved safe, dignified and sustainable integration in that location.

- **Locally integrated IDPs:** IDMC characterises people as locally integrated when they have demonstrably achieved safe, dignified and sustainable integration in the location to which they were displaced.

- **People displaced across borders:** These are people forced to seek refuge abroad as a result of disasters, irrespective of their legal status in receiving countries. All refugees have been displaced across borders, but not all people displaced across borders receive refugee status. Internationally displaced people include former IDPs who seek safety abroad and people who flee their country directly without having been internally displaced.

Given these definitions, it is difficult to estimate the number of people displaced by a disaster at a given point in time. There is relatively little comprehensive, accurate observational time series data on the number of people displaced before, during and after such as event. Many figures reported during the emergency phase cannot be verified and subsequently prove to be inaccurate.

There is also little data collection on outflows associated with disaster displacement. It is difficult, for example, to ascertain when people leave evacuation centres or where they go. It is usually simply assumed that they have returned to their homes. Nor is it possible to assess their vulnerabilities, which represents an obstacle to response.

DEALING WITH DIFFERENT TERMS AND UNITS OF MEASUREMENT

Disaster impact reports all too often use different metrics, including "families" and "households", which makes it difficult to compile accurate estimates of the number of individuals involved. To overcome this challenge, IDMC uses the average household size taken from national census data and demographical models for each country.

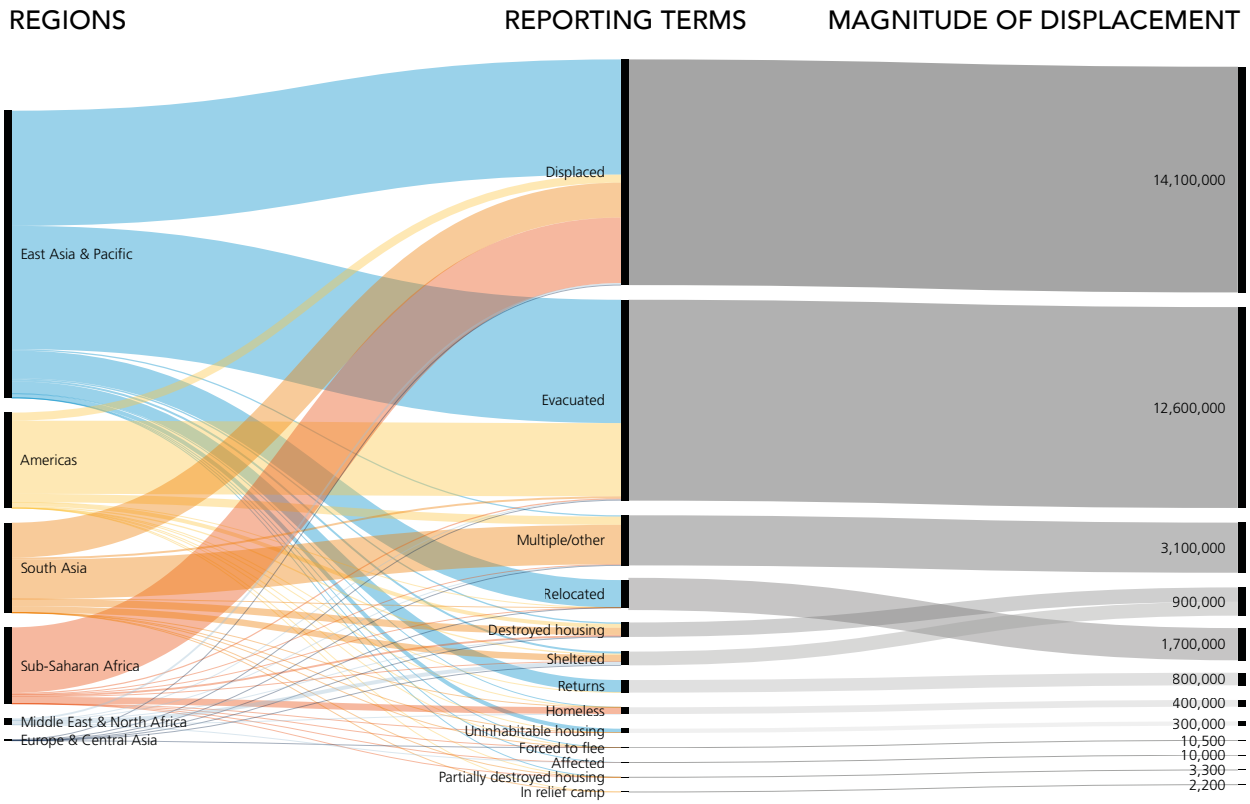
After cyclone Titli struck India in 2018, for example, the Andhra Pradesh State Disaster Management Authority reported that 21,348 homes had been destroyed. By extrapolating the data obtained using the average household size, we estimated that 100,336 people had been displaced. This does not, however, provide information on IDPs' individual characteristics.

The Sustainable Development Goals (SDGs) and the Sendai framework both encourage the collection and dissemination of disaggregated data under the premise of "leaving no one behind". IDMC attempts to disaggregate data by sex, age and other characteristics such as socioeconomic status, ethnicity, disability, membership of vulnerable groups and location. Doing so is vital in guiding an appropriate and effective response to IDPs' protection and assistance needs but is by no means always feasible.

The two terms most commonly used to report on displacement are "displaced" and "evacuated", and they are often used interchangeably. Figure 9 shows these and the other most widely used terms collected in our database, which reveals significant differences from region to region.

This may not seem like a problem, but imprecise and inconsistent terminology combined with a lack of time series data makes it difficult to determine when people are displaced, if they moved before, during or after the disaster in question, and what their differentiated vulnerabilities and needs are. This ambiguity, in turn, poses a challenge for policy and decision-makers because it hinders efforts to assess the effectiveness of measures to manage and reduce disaster risk.

FIGURE 9: Reporting terms collected in IDMC database in 2017 and 2018



TIME SERIES DATA: ASSESSING THE DURATION OF DISPLACEMENT

With a few exceptions, it is difficult to estimate the length of people's displacement. This is a major gap that is far from being filled and requires attention, particularly given that internal displacement is becoming increasingly protracted. The scale of displacement triggered by disasters can change rapidly before, during and after an event for a variety of reasons. The intensity of hazards, the extent of people's vulnerability and the distance they move from their homes are among the factors that impede detailed assessments and the production of time series data.

Given that much of the published data on disaster displacement concerns evacuations, many people suppose that displacement is a relatively short-lived phenomenon. It is often assumed that once a disaster has abated and evacuations have ended, people are no longer displaced.

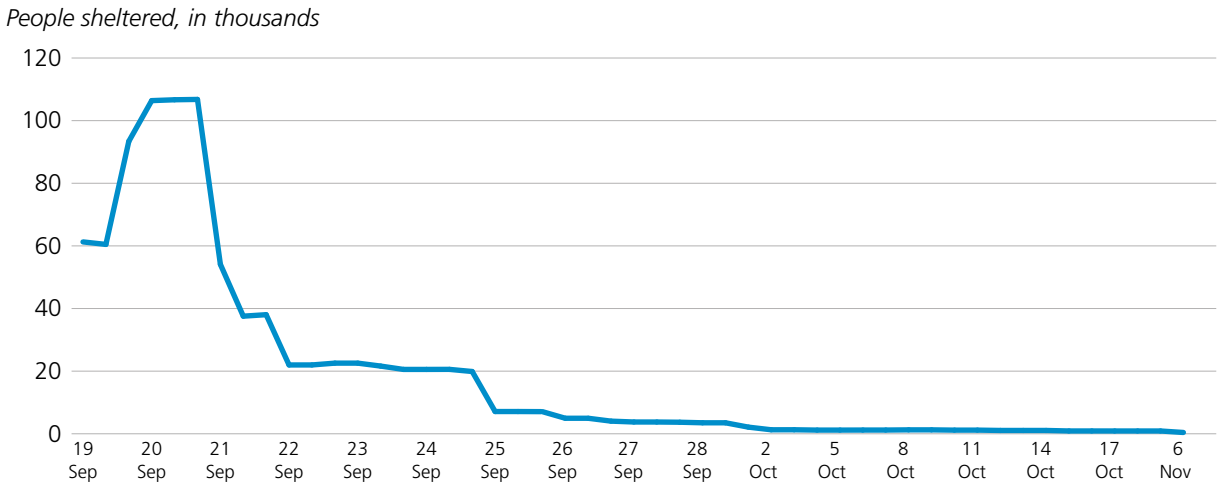
This perception is reinforced by an inherent bias in data collection and reporting processes. The vast majority of displacement data comes from the emergency phase of crises. IDMC has found that for more than half of the largest disasters recorded since 2008 it was collected for less than a month. In other cases, it was collected for only a few days. Data stops being collected before the number of IDPs has returned to zero and long before many have achieved a durable solution.

The Philippines is a rare example of a country where information about the way displacement evolves over time can be obtained, as was the case for typhoon Mangkhut in 2018. As figure 10 shows, there was a spike in the number of people displaced on 19 September before the storm made landfall. This corresponds to mass pre-emptive evacuations. People continued in displacement on 20 September as Mangkhut bore down on the country, but the following day around 70,000 people left the evacuation centres and returned to their homes. By 28 September, nearly everyone had returned. This suggests that most people were displaced for only one or two days, and at the most ten, but it does not necessarily mean that all those who left the evacuation centres were able to achieve durable solutions.

Analysing time series displacement data reveals the impacts of preparedness and response measures, essential evidence for informing policies and plans to reduce and manage future disaster and displacement risk. With few exceptions such as the Philippines, however, obtaining time series data and determining the end of displacement remains a key challenge. That in turn makes it difficult to compile a disaster stock figure, an end-of year estimate of the number of people living in internal displacement as a result of disasters.

Without it, aggregate global estimates of the number of people living in displacement are incomplete. UNHCR adds its global number of refugees to IDMC's conflict stock figure to arrive at a global displacement figure that is often cited by media and policymakers, but without a disaster stock figure it constitutes a considerable

FIGURE 10: Typhoon Mangkhut, Philippines – people in evacuation centres, 2018



underestimate. This gap also encourages the framing of displacement as associated exclusively with conflict, when in fact it is a much broader and more complex phenomenon.

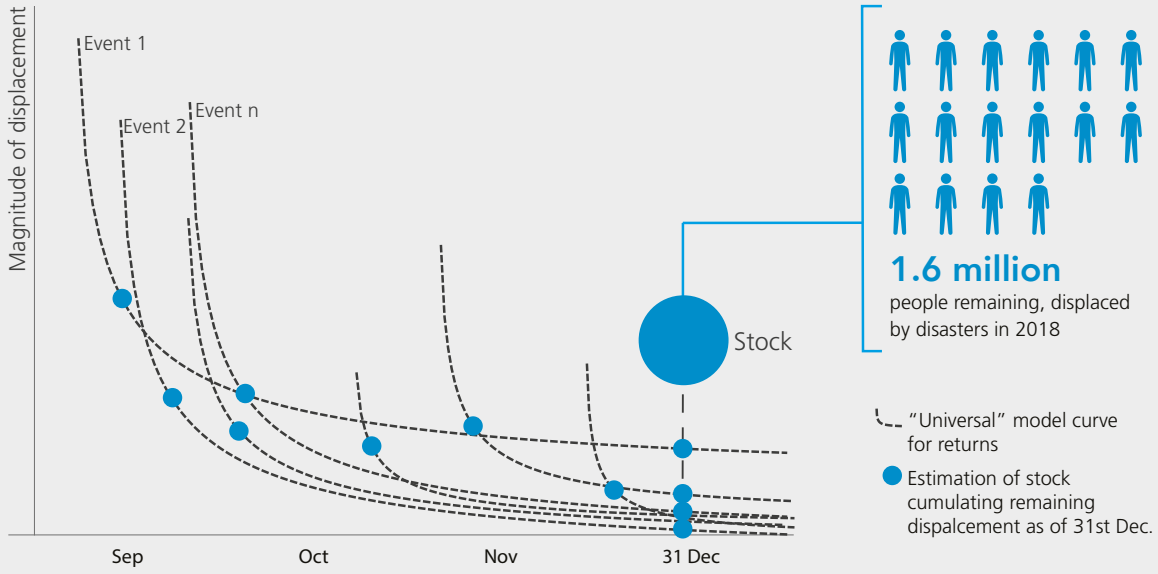
From an advocacy perspective, global figures that do not account for people displaced by disasters make it more difficult to call attention to the issue despite the fact that the number of new displacements triggered by disasters is on average 3.7 times higher than the figure for conflict and violence.

IDMC was able to estimate a global stock figure for disaster displacement for the first time in 2018. We were

BOX 6. ESTIMATING A DISASTER STOCK FIGURE FOR 2018

Figure 11 is a conceptual illustration of how IDMC estimated the number of people living in displacement as a result of disasters as of the end of 2018. The dotted lines represent time-series curves for the stocks for different disasters, and the overall stock figure on a given date equals the sum of the values of each curve on that date.

FIGURE 11: A conceptual illustration of IDMC's disaster stock estimation



We applied a two-step approach based on data gathering and modelling to calculate our stock figure. A data pool from a variety of sources was compiled, based primarily on around 100 disaster events recorded in our database during the year. Each time series describes how the number of people displaced in a specific location evolved over time.

These time series were used to model the remaining displacement for each event. The model does not distinguish between different disaster types or location because not enough data was available to do so. A simple model was used because it provided a good fit with the observational data and was easy to interpret. We may construct specific models for hazard types or countries in the future as more time series data becomes available.

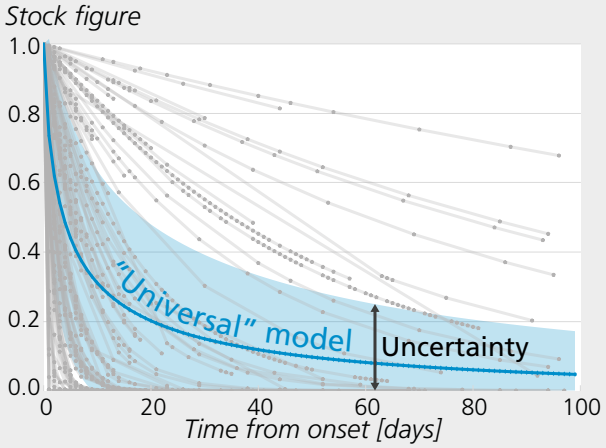
We derived a closed mathematical expression for the model. By using the most recent stock we had for each of the events that took place in 2018, we applied the model to produce a global stock figure of 1,601,150 people. Given the uncertainty of the model, however, the number could be twice as high.

able to obtain more and better data from partners and use models to fill gaps. By doing so we inferred that more than 1.6 million people were living in displacement as of 31 December as a result of disasters that took place during the year. The figure is highly conservative, because it does not include people displaced by disasters before 2018. More work needs to be done to refine the model in 2019 and beyond (see box on estimating a disaster stock figure for 2018).

The learned curve is heavily skewed toward capturing evacuations, which dominated the time-series pool used for training. This type of displacement tends to last for relatively short periods of time. The same curve is also applied to all events, regardless of whether the reported figures correspond to evacuations or displacements. This implicit assumption is a significant source of modelling error because the same decay rate is applied even if the reported displacement was inferred from figures for housing destruction.

This methodology is a first step toward estimating a global stock figure for disaster displacement. We will refine the model by using additional and more representative data, testing and validating it against observational data and employing more complex modelling methods. Taken together, these improvements will help to estimate how the number of people displaced by disasters evolves over time more accurately.

FIGURE 12: Estimating the decay rate for disaster displacements



Note: The time series for the 100 events are approximated by exponential functions. The average of the time series is used to fit the "universal" model, depicted by the thick black line. The grey interval either side depicts the uncertainty in the prediction.

A major challenge in monitoring displacement flows associated with disasters is the significant data and knowledge gap about what happens to people after they become displaced. Continuous time series data on the number of people displaced and their characteristics is essential for delivering appropriate and effective assistance, and the lack of it is significant obstacle. It is also needed at the global level to measure progress toward achieving the 2016 World Humanitarian Summit's target of reducing internal displacement by 50 per cent by 2030.[50]

To arrive at a more robust global figure based on information about who is displaced, from where, to where and for how long, partnerships at the national and international level need to be strengthened and government agencies' capacity to record displacement data improved. Greater collaboration would also help to explore the untapped potential of data to generate evidence and insights about the whole spectrum of human mobility and its links with development challenges and opportunities.

4

WHO MONITORS DISASTER DISPLACEMENT

A broad range of stakeholders with diverse roles produce and publish internal displacement data for different reasons. They include governments, UN agencies, local and international NGOs and research organisations. Some focus on data collection, others its analysis and sharing and others still perform a combination of functions.

This chapter introduces the main monitors of disaster displacement and discusses how IDMC collects, validates and publishes data to arrive at its global estimates. It also includes a mapping of stakeholders with the objective of calling for improved collaboration and interoperability of datasets, which it turn would better inform decision-making to address and reduce the impacts and risk of disaster displacement.

THE DATA ECOSYSTEM

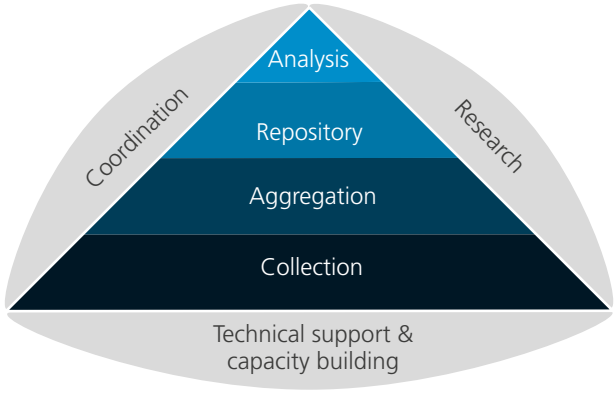
Internal displacement data is often collected or analysed as part of wider exercises, or may be extrapolated from reports that focus primarily on other issues such as housing or protection. It rarely covers the full scope of displacement crises, whether because of access restrictions, funding shortfalls, security issues or other factors. Nor is the data collected always made public to increase transparency and accountability.

The displacement data process has several stages:

- **Primary data collection:** Stakeholders gather specific information on IDPs and other populations affected by crises, using methods including key informant interviews, surveys and various forms of registration.
- **Data aggregation:** The primary data is consolidated with other data to facilitate analysis, whether for geographical, sectoral, temporal or thematic purposes. The process includes triangulation with other information from various sources and other checks on the data's quality (see box on triangulation).
- **Data analysis:** The data is evaluated and scrutinised to inform and support policymaking, operational decisions, reporting and research.
- **Data repository:** The data is stored in repositories, platforms that host it according to specific categories and which are used to facilitate analysis, reporting and research.
- **Coordination:** The work of different data collectors and aggregators is brought together to share information and, where relevant, align their efforts.
- **Research:** The use of primary or aggregated data to produce qualitative and quantitative studies that explore specific lines of inquiry and answer specific questions.
- **Technical support and capacity building:** The provision of expert advice and training to governments and other stakeholders to build or reinforce their capabilities in areas such as profiling and other data collection methods.

The main functions various stakeholders perform in the data process at the national and global level are outlined below (see figure 13).

FIGURE 13: Functions in the internal displacement data ecosystem



Data analysis: Local NGOs, research bodies, governments, clusters, UNHCR, IOM, REACH, UNICEF, WFP, IDMC, PDD, ACAPS Red Cross and Red Crescent Societies and other INGOs

Data repository: Governments, IDMC, HDX, IOM, UNHCR-WB joint data centre, WB Open Data Initiative

Data aggregation: Regional bodies, governments, OCHA, UNHCR, IOM, REACH, IDMC

Data collection: Governments, UNHCR, IOM, OCHA, NRC, REACH, UNICEF, WFP, Red Cross and Red Crescent Societies, local NGOs

Data coordination: Governments, OCHA, clusters

Technical support and capacity building: JIPS, IDMC, INGOs, UN agencies, clusters, WB

Research: IDMC, ACAPS, UN agencies, INGOs, research bodies, governments

This graphic is not intended to be an exhaustive listing of organisations contributing to each category.

IDMC does not collect primary data, but relies instead on that gathered by around 2,000 unique sources. The process of obtaining internal displacement data continues to be a significant challenge, despite various UN General Assembly resolutions encouraging governments to collect and share their information with us and the broader public.[51]

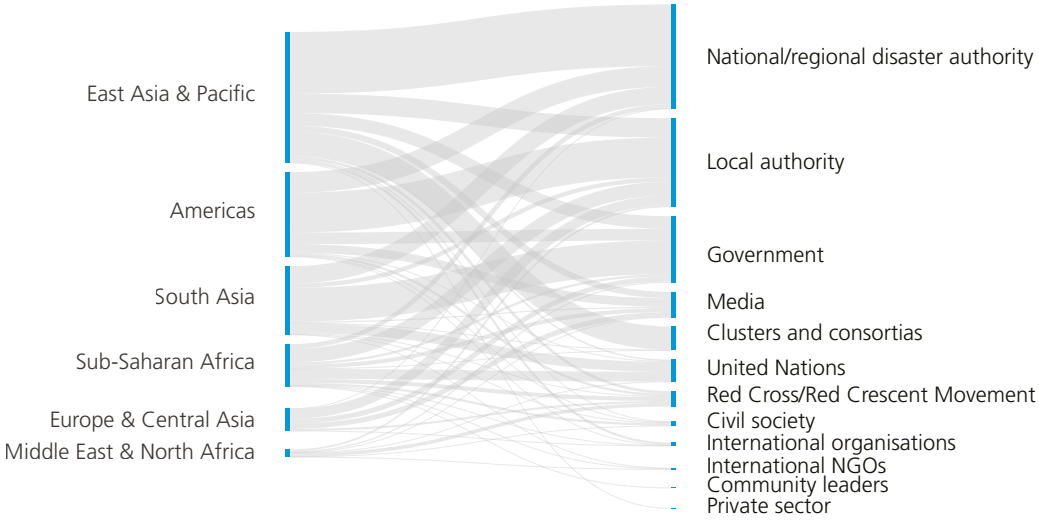
We work primarily with national authorities and UN agencies, but the media is an important source of information for triangulation and also helps to ensure better coverage of smaller disasters, which otherwise tend to be under-reported. The humanitarian community does not always pick up on and report small-scale disaster displacements, and local and national government agencies tend not to have the capacity to collect information about them.

More than 70 per cent of our disaster displacement figures are based on data obtained from government bodies, most of which are national or regional disaster agencies and local authorities (see figure 14). More than 25 per cent are obtained from media outlets quoting such sources.

TRIANGULATION

The main purpose of triangulating data is to increase its credibility. IDMC uses triangulation to validate datasets from various sources that describe the same phenomenon. Doing so becomes even more relevant given today's fast-moving news cycle, the proliferation of unverified reporting and "fake news", and the fact that anyone can present such information. This has the

FIGURE 14: Sources of IDMC's estimates for displacement associated with disasters by region



potential to lead to significant discrepancies in what is reported. Around 70 per cent of the disaster displacement information recorded in our database in 2018 was used for triangulation (see box on triangulation).

As we highlight in GRID 2018, "accountability starts with counting".[52] Responsibility for recognising, reporting and responding to disaster displacement is growing steadily, and governments increasingly collect and analyse information about the phenomenon. Efforts to fill gaps and overcome challenges must, however, be intensified. Understanding disaster displacement in all of its dimensions, temporal and geographical, is key to reducing its negative impacts and measuring the progress of disaster risk reduction strategies.

STAKEHOLDER MAPPING

One of the objectives of this report is to undertake a mapping and scoping study on disaster displacement data collection approaches, partnerships and interoperability at the global level. Table 1 presents a non-exhaustive list of stakeholders that collect, aggregate, publish, curate and analyse data about IDPs with a focus on disaster displacement. Access to datasets varies from open to heavily restricted, the latter particularly the case for private sector data such as that collected, produced and used by insurance companies.

BOX 7. THE IMPORTANCE OF TRIANGULATION

The value of triangulation is demonstrated by IDMC's method of estimating displacement associated with disasters in Afghanistan. IOM and OCHA each work closely with local humanitarian organisations to produce two comprehensive datasets on disaster damage. OCHA recorded 235 disaster incidents in the first six months of 2018, and IOM 304 incidents. The datasets overlapped geographically. OCHA's covered 24 of Afghanistan's 34 provinces, and IOM's covered 26. Twenty-three provinces were covered by both. The two datasets differ in the terminology they use to classify disaster events and damaged and destroyed housing, which highlights the need to synchronise and develop common definitions and metrics.

We used the two datasets to analyse displacement triggered by floods in May 2018. Using OCHA's data on housing destruction as a proxy for the number of people displaced yielded a figure of 24,589. IOM's data on housing destruction produced an estimate of 12,090. Additional IOM data on affected people living with host families, in open spaces and informal settlements suggested that 44,884 people had been displaced. We compared the data taking into account the differences in definition and coverage and the potential for double counting. We also triangulated the data with information from media sources to arrive at a final figure of 46,380 people displaced.

TABLE 1: Disaster displacement data providers

Organisation	Type of stakeholder	Coverage	Metrics reported	Description	Comments/limitations
Copernicus EMS	Data collection and data repository (geospatial data)	Global	Damage assessment data - dwellings completely destroyed, severely damaged and partial damaged	Copernicus Emergency Management Service (EMS) provides geospatial data and analyses based on satellite imagery taken before, during and after a crisis. It generates reference maps and pre and post-disaster situation maps. Analysis is activated as part of the International Charter for Space and Major Disasters or by authorised users.	Information about displaced populations is not consistently available in all publications Information is published as infographics in PDF format or as geospatial datasets Mapping service is activated only on demand No access to raw datasets is provided
UNITAR/ UNOSAT	Data collection and data repository (geospatial data)	Global	Damage assessment data - destroyed infrastructure	Provides maps and analyses based on satellite imagery before, during and after a crisis. Also contributes to the activities of the International Charter for Space and Major Disasters.	Information about displaced population is not available consistently in all publications Information is published as infographics in PDF format or as geospatial datasets Mapping service is activated only on demand No access to raw datasets is provided Has produced mapping products for about 109 countries, but it is not possible to filter the publications
IDMC	Data collector, analyst, publisher and repository (including geospatial data)	Global	Destroyed housing, evacuations, displaced people, people rescued, people forced to flee, homeless people, Relief camp populations, partially destroyed housing, people relocated, uninhabitable housing, people sheltered and returns	Compiles data from diverse sources and uses different techniques such as media monitoring and satellite imagery analysis to fill data gaps. Raw dataset is open for download and use.	Global Internal Displacement Database (GIDD) aggregated at national level and by disaster events from 2008 to 2018

Organisation	Type of stakeholder	Coverage	Metrics reported	Description	Comments/limitations
ECHO - European Civil Protection and Humanitarian Aid Operations	Data publisher	Global	Depends on the context, but may include destroyed buildings, evacuations, people displaced	Reports different metrics	Lack of raw data Information about housing destruction or displaced people not available consistently in all publications
EM-DAT	Data curator and repository	Global	Affected, homeless and damages to housing	The database is compiled from sources including the UN, government and non-governmental agencies, insurance companies, research institutes and press agencies. Data is aggregated at the national level. EM-DAT contains essential core data on the occurrence and effects of disasters from 1900 to present.	Minimum thresholds - 10 or more people dead, 100 or more people affected Data recording triggered by declaration of a state of emergency or a call for international assistance Does not provide specific data about disaster displacement but rather information about "homeless" people that seems to have a strong correlation with the population whose displacement was triggered by disasters Collects information on buildings destroyed, but this is not publicly available
DesInventar	Data collector at country level and data repository for disaster losses	Global	Houses destroyed, directly affected population, people evacuated, people indirectly affected, people relocated.	DesInventar's disaster information management system has tools to analyse disaster trends and their impacts in a systematic way. Its datasets are generated at the national level by disaster management agencies.	Does not provide data about displaced people, though provides information about people evacuated and relocated and on housing destruction reported by national authorities Dataset depends on updates at country level Public website provides data on 85 countries, of which just 18 have updates for 2018 Many indicators related to displacement are not always reported by national authorities

Organisation	Type of stakeholder	Coverage	Metrics reported	Description	Comments/limitations
Floodlist	Media aggregator and data publisher	Global	Damage to housing, people affected, evacuated and displaced	Reports of flood events around the world.	Only provides displacement estimates for flood events
IFRC - International Federation of Red Cross and Red Crescent Societies	Data collector and analyst	Global	Depends on the context, but includes buildings destroyed, people evacuated, people displaced	Reports on events in which national Red Cross and Red Crescent societies contribute to response and recovery operations pre and post-disaster.	Disaster related information is present in appeals, but they do not consistently report on displaced people Lack of public centralised database with raw data relevant to reported metrics
ReliefWeb	Data publisher	Global	Depends on the context, but includes buildings destroyed, people evacuated, people displaced	ReliefWeb is a humanitarian website managed by OCHA that provides access to information and analysis including documents and maps about humanitarian emergencies. Ad hoc reporting	Lack of raw data
International Charter for Space and Major Disasters	Data collector and repository	Global	Damage assessment data includes buildings destroyed, severely damaged and partial damaged	The charter is a global collaboration through which satellite data is made available to assist disaster management. It combines Earth observation assessments to help the coordination of resources and expertise for rapid responses to major disasters. Data analysis is provided upon request.	Not all activities provide data on housing destruction
DORRIS	Media aggregator and data publisher	Global	Depending on search terminology, can find information on evacuations, displacement, housing destroyed	Disaster Observation and Reporting - Rapid Information System helps local authorities and emergency services to alert citizens about expected natural, technological and human-made disasters and emergencies.	List is global, but doesn't always include displacement information

Organisation	Type of stakeholder	Coverage	Metrics reported	Description	Comments/limitations
GDACS	Media aggregator and data publisher	Global	Depending on search terminology, can find information on evacuations, displacement, housing destroyed	GDACS is a cooperation framework between the UN, European Commission and disaster managers worldwide to improve alerts, information exchange and coordination in the first phase after major sudden-onset disasters.	List is global, but doesn't always include displacement information
GLIDE	Media aggregator and data publisher	Global	Depending on search terminology, can find information on evacuations, displacement, housing destroyed	The GLobal IDEntifier number is a globally common unique ID code for disasters proposed by the Asian Disaster Reduction Center (ADRC). Documents and data on specific events can be easily retrieved from various sources and connected using these numbers.	List is global, but doesn't always include displacement information
Global Hazards Weekly Bulletin	Media aggregator and data publisher	Global	Depending on search terminology, can find information on evacuations, displacement, housing destroyed	Weekly bulletin from University of Reading's meteorology department that aggregates news on disasters	List is global, but doesn't always include displacement information
MunichRe	Data collector and analyst	Global/ regional	Depending on search terminology, can find information on evacuations, displacement, housing destroyed	Insurance company that provides global risk analysis	Direct displacement figures not available but complementary information -analysis and trends on disasters, damage and impact, and proxies such as houses destroyed/damaged – is available Good coverage on high and upper middle-incomes countries
National civil defence and protection agencies, including Indonesia's National Board for Disaster Management	Data collectors and analysts (country specific)	National	Depending on the country, buildings destroyed, evacuations, people displaced	Depending on the country, can assess the number of people affected, houses destroyed, evacuations and displaced people, among other types of data	Raw data is not usually available Reports and information generated in different formats, depending on national information management systems in place

Organisation	Type of stakeholder	Coverage	Metrics reported	Description	Comments/limitations
National disaster management agencies including Nepal's Disaster Risk Reduction Portal from the Ministry of Energy, Water Resources and Irrigation	Data collectors, analysts and repositories (country specific)	National	Depends on the country, buildings destroyed, people evacuated, people displaced	Loss and damage data, evacuations, displaced people	Problems of interoperability and metadata
National Red Cross or Red Crescent societies such as the American Red Cross	Data collectors and analysts	National	Depends on each country, but may include buildings destroyed, people evacuated, people displaced	Report on areas were national societies operate	Data is published using different and not always consistent metrics and structures Raw data is not always available
International NGOs such as MapAction, iMMAP, HRW, Care, REACH Initiative and NRC	Data collectors	National level or countries with active presence, depending on organisations' geographical reach	Depends on the organisation, may include buildings destroyed, people evacuated, people displaced	Different organisations gather and process data and information on the impact of disasters. This includes satellite imagery analysis and mapping of areas and people affected	Information is published as ad hoc reports, usually in PDF format Information is seldom centralised and raw datasets are not always available
HDX	Data repository	Partial	Depends on the context, but may include buildings destroyed, people evacuated, people displaced	Repository of humanitarian datasets. Has data on IDPs for more than 200 countries and territories. IDMC is one of the providers	-Not all entries tagged with the IDP label contain relevant data. In some cases they contain refugee data -Database depends on the contributions of humanitarian organisations
UNHCR	Data collector, publisher and analyst (context specific)	Partial. Depends on the operational areas covered	Depends on the context, but may include buildings destroyed, people evacuated, people displaced.	Disaster displacement is not systematically reported. Data availability depends on the organisation's operational coverage.	Ad hoc reporting on IDPs

Organisation	Type of stakeholder	Coverage	Metrics reported	Description	Comments/limitations
IOM DTM and RAF	Data collector, repository, curator, and publisher	Partial. Depends on the operational areas covered	Depends on the context, but may include buildings destroyed, people evacuated, people displaced.	Disaster displacement is not systematically reported. Data availability depends on the organisation's operational coverage. Disaster related data for around 22 countries as of April 2018.	Ad hoc reporting in areas where DTM operates
OCHA	Data collector, publisher and analyst (context specific)	Partial. Depends on the operational areas covered	Depends on the context, but may include buildings destroyed, people evacuated, people displaced.	Disaster displacement is not systematically reported. Data availability depends on the organisation's operational coverage.	Ad hoc reporting in areas where OCHA operates Most information available via humanitarian snapshots
Other UN agencies and international organisations such as UNICEF, PAHO, WHO, UNDP (including post-disaster needs assessments with the World Bank)	Data collectors	Partial. Depends on the operational areas covered	Depends on the context, but may include buildings destroyed, people evacuated, people displaced.	Disaster displacement is not systematically reported. Data availability depends on the organisation's operational coverage.	Ad hoc reporting available via ReliefWeb and agency websites Lack of raw data
Private sector such as CatNat, CATDAT	Data collectors and analysts	Partial/ regional	Depends on the context, may include buildings destroyed, people evacuated, people displaced.	Primarily intended to capture economic impacts of disasters, such as damage and destruction of housing and other infrastructure.	Data is seldom open access
AHA Centre	Data collector and analyst	Regional	People affected and people displaced	Governmental organisation established by ASEAN. Aims to facilitate cooperation and coordination of disaster management amongst member states.	Ad hoc reporting available as part of situation reports

GLOBAL AGGREGATION

Only two data repositories on disaster displacement exist at the global level: the Emergency Events Database (EM-DAT), maintained by the Centre for Research on the Epidemiology of Disasters (CRED) at Louvain Catholic University (UCL); and IDMC's Global Internal Displacement Database (GIDD).[53] The two repositories help to analyse disaster displacement trends and impacts systematically (see table 2).

EM-DAT is a country-level database, meaning that the data is aggregated at the national level and provides temporal, human and economic information on disasters. The main indicators that are publicly available and comparable with IDMC's recorded information are affected, homeless, and total affected:

- **Affected:** People requiring immediate assistance during a period of emergency, i.e. requiring basic survival needs such as food, water, shelter, sanitation and immediate medical assistance.
- **Homeless:** Number of people whose house is destroyed or heavily damaged and therefore need shelter after an event.
- **Total affected:** In EM-DAT, it is the sum of the injured, affected and left homeless after a disaster.

EM-DAT contains 3,572 events recorded between 2008 and 2018, excluding slow-onset, biological and technical disasters. Almost three-quarters have information on mortality and total affected. Around 70 per cent have information on affected, and 35 per cent on injured and economic losses. Only 20 per cent have publicly available information on homeless.

EM-DAT recorded more than 19 million people homeless over the same timeframe, which amounts to seven per cent of IDMC's total of 265 million new displacements. And around 1.3 billion "affected" people received immediate assistance during an emergency including pre-emptive shelter.

Country-level aggregation and disaster loss databases

There are few national-level initiatives to collect and store disaster displacement data. Disaster management authorities have, however, made significant progress in recording the impacts of disasters. Data on houses destroyed in particular can be used to estimate the number of people forced to flee.

National efforts are important for a number of reasons. They account for many more events and include information on more indicators than those recorded in EM-DAT and GIDD. Most national disaster databases are maintained by governments, which are key sources of information. Collecting data on impacts also helps to

TABLE 2: Comparison of EM-DAT and GIDD

	EM-DAT	GIDD
Specific indicator for displacement	No, only "homeless"	Yes
Criteria and thresholds	At least one of the following: 10 or more people dead 100 or more people affected Declaration of a state of emergency Call for international assistance	At least one person reported displaced
Temporal coverage	1900 – present	2008 – present
Number of events	13,380 as of 1 May 2019	7,580 as of 1 May 2019

understand historical trends, which in turn can inform better prevention, mitigation and preparedness measures and reduce the impact of disasters on communities.

One initiative worth highlighting and that the UN supports is DesInventar, under which 89 countries and territories have established a standardised methodology to record disaster impacts. Each database is maintained by national authorities and has no thresholds for entering information. Compared with databases such EM-DAT, which have thresholds, national disaster loss databases are much more comprehensive. For example, EM-DAT contains around 13,400 events for the period 1970 to 2015, but national disaster loss databases contain more than 328,000.[54] The latter were not designed to account for disaster displacement, but they contain information on housing damage and destruction or people relocated and evacuated for more than 144,000 disasters.[55]

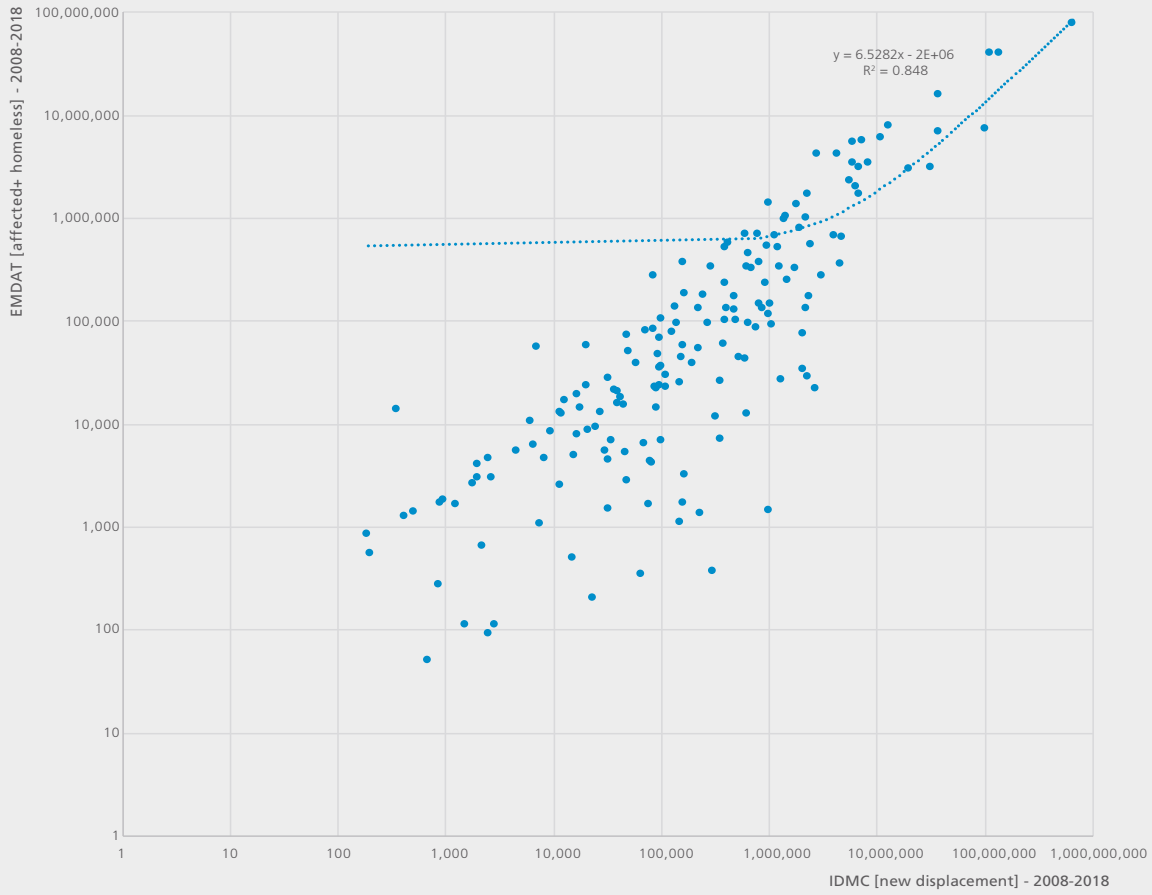
BOX 8. EXTENDING IDMC'S HISTORICAL COVERAGE WITH DATA FROM EM-DAT

Given that GIDD extends back only to 2008, we do not know how many people were displaced before that date. To obtain a rough estimate, we have explored ways of filling this historical gap. One way is to establish a statistical correlation between our data on the frequency and magnitude of new displacement and EM-DAT's on indicators such as affected and homeless.

Figure 15 shows that there is a close correlation between EM-DAT and IDMC data. We aim to refine this analysis to extrapolate from EM-DAT data the annual global number of new displacements prior to 2008 and to calculate the margin of error associated with these estimates.

FIGURE 15: Displacement in EM-DAT vs IDMC

160 countries analysed, Correlation R2 = 0.85.

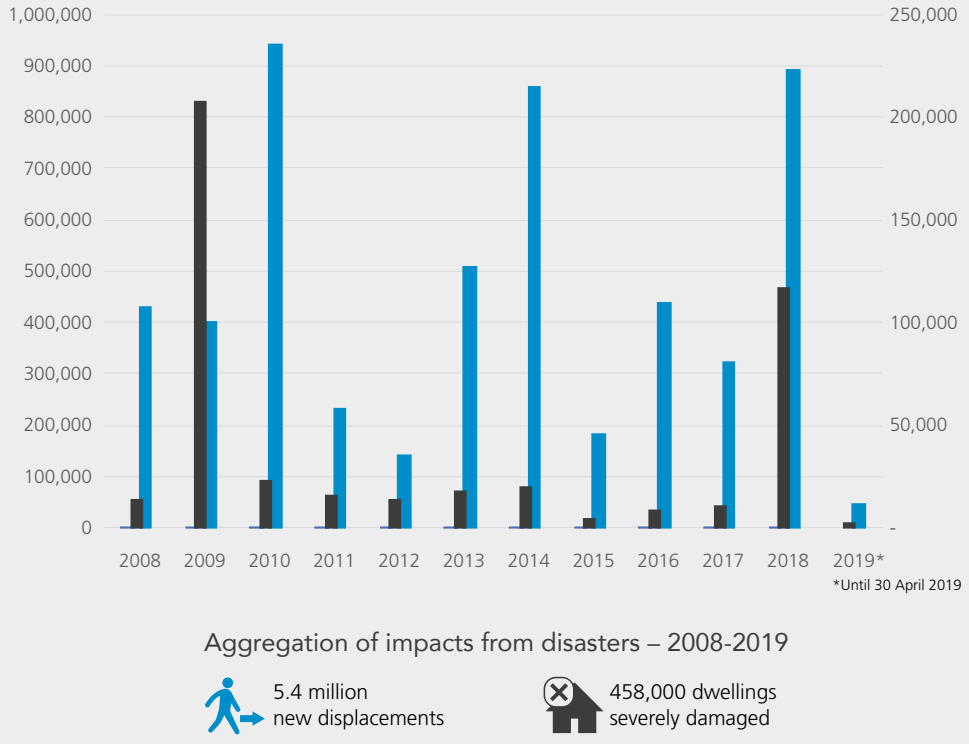


BOX 9. INDONESIA – A DATA HOTSPOT

Indonesia is made up of more than 17,000 islands, all prone to disasters. It has a large and dense population, which means many people live in highly exposed areas, and low economic development in some parts of the country, which leads to poor coping capacity, means the country is also highly vulnerable to disasters. These factors combine to give Indonesia some of the highest levels of disaster displacement worldwide. Most is linked to evacuations to government-run shelters and evacuation centres. Early warning systems mean these are pre-emptive for some hazards.

The National Disaster Management Agency (BNPB) collects data systematically based on the DesInventar mechanism and is the main source of information on disaster displacement in the country. Its status is equal to that of a national ministry, it reports to the president and its mandated tasks include coordinating disaster management activities and assuming command in an emergency. BNPB reports on displacement figures through press releases, infographics and other communication products, and maintains an online data repository.

FIGURE 16: Disaster impacts in Indonesia – 2008-2019



The repository is updated regularly with information on where and when disasters take place, the type of hazards that trigger them and the number of people killed, missing, injured and displaced or evacuated. It also contains information on housing damage, including whether the damage is light, partial or severe.

Having this kind of information available, regularly updated and easily accessible online is invaluable for monitoring organisations such IDMC and those developing policies and recommendations that save lives.

Source: National Disaster Management Agency (BNPB)

5
THE WAY FORWARD

As the number of disasters that trigger internal displacement continues to rise and the population at risk grows daily, it is vital that all those working on the phenomenon have access to reliable data. IDMC obtained data about disaster displacement for 144 countries in 2018, but despite our best efforts we were unable to paint a comprehensive global picture. Our baseline figure is still an underestimate.

Data accessibility and quality are the main challenges to address if the international community is to have an accurate overview of how many people have been displaced, their characteristics, the reasons for their flight and the duration of their displacement.

There are a number of challenges in accessing reports, figures and contextual information on disaster displacement, one of which is language. This not only restricts the number of sources that monitors are able to access. It also affects the quality of the information reported and makes triangulation more time-consuming, whether because the information has to be put through an online translator or verified with speakers of the language in question. The lack of reporting on small-scale events is also an issue, and there are significant gaps in the overall data that is obtained.

Disaster displacement needs to be understood in all its dimensions, including temporal and geographical considerations, as does the ethnic background, age, sex, gender, physical and mental health of those displaced. Such information would help to contextualise and forecast broader human mobility trends and measure the success of strategies to reduce its negative impacts. This last chapter highlights the outstanding challenges and makes recommendations to overcome them.

INTEROPERABILITY AND STANDARDISATION

Data collectors must improve their operational efficiency and promote greater interoperability to enable "data consumers" to access, analyse and learn from one another's information and practices.

EGRIS notes:

> *"When data are collected, the quality needs to follow international standards as outlined, for example, in the Fundamental Principles of Official Statistics. This includes following agreed-upon statistical frameworks and definitions, generating proper documentation of*

A teacher asks children to name known disasters in an elementary classroom in Pohnpei, Micronesia. Photo: IOM/Muse Mohammed, November 2017

BOX 10. ADDING HXL HASHTAGS WITH OCHA AND IOM

Sharing the data generated by IOM's displacement tracking matrix (DTM) with a broader audience increases its reach and impact, but this requires it to be harmonised and its quality and usefulness improved.

Adding a row of "HXL hashtags" to a spreadsheet greatly simplifies interoperability. '#country+name', for example, always identifies a column containing country names, '#adm1+name' always identifies a column containing top-level geopolitical subdivision names, and '#affected+idps+ind' always identifies a column containing the number of IDPs (see figure 17). The hashtags are standardised, which means differences in column ordering or the number of columns no longer pose a problem.

IOM staff are already engaged in our new standard operating procedure, which is to upload and update DTM data on the Humanitarian Data Exchange (HDX), and they add HXL hashtags to improve data processing and sharing. Commonly used tags are used to indicate administrative division, geographical information, population groups, sectors, types of need, and incidents or event.[56]

FIGURE 17: Example of a data sheet with HXL tags

	Country	Top-Level Geopolitical Subdivision	Number of IDPs
#HXL	#country+name	#adm1+name	#affected +idps +ind
	Burundi	Admin1	Nombre de PDI
	Central African Republic	ADM1_NAME	IDP_ind
	Libya	ADM 1 Geodivision (EN)	IDPs in Baladiya (IND)
	Madagascar	Admin 1	Total No# of IDPs Ind#
	Nigeria	State of Displacement	Number of IDP

HXL is a different kind of data standard, designed to complement rather than replace existing humanitarian data processes. It is supported by a range of partners and convened by the UN Office for the Coordination of Humanitarian Affairs (OCHA), which hopes the use of common tagging will reduce duplicate reporting, improve interoperability, partially automate data preparation and revitalise existing visualisation applications.

how data have been collected and processed, ensuring confidentiality of all respondents, and establishing a dissemination plan including information on how the data will be made available to the public.

As part of these recommendations, internationally comparable indicators will be developed … Implementing comparable global indicators will improve the quality and comparability of national and international statistics and improve capacity for evidence-based decision-making and planning on different levels."[57]

The Sendai framework also emphasises this need. It recognises that states are responsible for reducing disaster risk, and that this responsibility should be shared with other groups including local governments, the private sector and civil society. To achieve this, it stipulates that it is important to:

- Collect, analyse, manage and use data and practical information and ensure its dissemination
- Systematically evaluate, record, share and publicly account for disaster losses and understand their economic, social, health, education, environmental and cultural impacts

UNDRR's Words Into Action on Disaster Displacement says: "Tools and systems used to collect and analyse the data should be interoperable to facilitate sharing, exchange and comparison".[58] Global-level initiatives at exist to tackle this challenge (see box on HXL hashtags).

RECOMMENDATION

International standards and interoperability systems must be adopted to record and share publicly all information on disaster displacement, including a range of metadata that covers:

- A data dictionary
- Description
- Date of creation
- Sources
- Methodology
- Caveats and comments
- Tags[59]

BIG DATA AND CROWDSOURCING

Alternative data sources and innovative analyses represent an opportunity to complement traditional data collection methods. EGRIS notes: "Significant expectations and methodological efforts are currently being channelled into the possible use of alternative large-scale data sources ("big data") for statistics in general."[60]

The analysis of social media is a powerful tool for obtaining timely information on the location and needs of vulnerable populations. Satellite images are now also quickly available in the aftermath of a disasters, making rapid impact assessments easier to carry out. New technologies such as natural language processing (NLP) and machine learning (ML) allow information analysts to process larger amounts of information and assess many sources. Advanced geographical information system (GIS) analysis and modelling provide a means to estimate the risk of future displacement and assess trends based on models of future climate change scenarios.

Technology is not equally accessible all over the world, however, which means that these innovative tools also present a significant methodological challenge. Significant resources are required to develop such alternative data sources, systematically validate the information they generate and ensure they provide useful insight for practitioners and policymakers.

Crowdsourcing, the practice of obtaining information by enlisting the services of a large number of people, could also be used to help add missing or new information to our disaster displacement data.

RECOMMENDATION

The ways in which new technologies and techniques can complement traditional data collection methods must be explored and investments made to realise their potential. This includes examining how social media can make data more accurate and the quality controls needed to validate such crowdsourced information.

Given that new technologies are more readily available in some parts of the world than others, efforts must be made to ensure that they are used to discover, confirm and reflect the needs of the most vulnerable people. In doing so, due consideration must be given to the data biases that arise from the fact that their geographical location and local wealth and individuals' gender or age determine their access or otherwise to such technologies.

DISAGGREGATION

Displaced people require interventions tailored to their circumstances based on their location, age, gender, ethnicity, socioeconomic background and other characteristics. Data disaggregation is essential to ensure that the most vulnerable people are characterised accurately and their needs properly addressed, and that no one is left behind. It is challenging, however, to obtain comprehensive disaggregated data on key metrics such as flows and stocks.

Understanding the characteristics of the most vulnerable groups and the factors that influence their displacement is equally important to better understand its implications for host communities and local and national governments. Better disaggregated data and statistics would also help governments to track their progress is

addressing displacement and improve their accountability, including for the achievement of global sustainable development goals.

RECOMMENDATION

Concerted efforts must be made to collect data disaggregated by sex, age and other characteristics including socioeconomic status, ethnicity, disability and other vulnerabilities. Along with data that is recorded, metadata or methodological notes should explain who may have been unintentionally excluded.

ACCOUNTING FOR THE DURATION AND END OF DISPLACEMENT

Providers of disaster displacement data tend not to include information about when, how and for how long people were displaced. One of the main gaps and challenges in accurately estimating the number of IDPs is the lack of measurement of return flows. Nor does data tend to be collected on people who have achieved durable solutions by integrating locally or resettling elsewhere in the country.

As EGRIS emphasises:

> *"The Guiding Principles contain no specifications related to the length of time a person must be displaced to meet IDP criteria. Even a brief pre-emptive voluntary evacuation may qualify. However, brief evacuations may not generate needs or human rights concerns if the displacement is requisite, prepared for, and safely executed – especially with due attention to the specific needs of vulnerable populations and if homes and livelihoods are not significantly disrupted. Likewise, someone does not cease to be displaced after a set period. Many IDPs will remain IDPs for decades and even for generations."*[61]

Not only is it impossible to compile robust stock figures for IDPs in the absence of reliable reporting on returns, local integration and resettlement. Determining the length, severity and end of their displacement in a globally comparable manner is also unfeasible. The extent of this gap is apparent in the fact that time series data is only available for 130 of the 7,000-plus disaster events recorded in IDMC's database. Of the 130, information on the number of IDPs reaching zero is available for just five.

This major blind spot also has significant implications for the provision of protection and assistance to those who remain displaced, and it underscores the need for much greater investment in monitoring displacement over time in all countries.

RECOMMENDATION

In addition to counting the number of IDPs at different points in time, data should be collected on all relevant flows, including new internal and cross-border displacements, returns, local integration and resettlement. Data should also be collected frequently enough to accurately reflect what is happening on the ground. To do means observing the following schedule:

Pre-emptive evacuations: Daily to hourly
First 10 days after the event: Daily
Day 10 to 30: Every two to three days
Day 30 to 90: Every 10 days
90+ days after the event: Once a month

SPATIAL CONSIDERATIONS

The Guiding Principles do not specify the distance that individuals must be displaced from their habitual residence to be recognised as an IDPs, but even people forced to flee just beyond the front door of their destroyed home should be considered so. When trying to track displacement, information often exists about where the people have been displaced from, but not how far and to where. This is an important gap with significant implications for responses.

The risk and impacts of displacement also differ between people displaced in rural and urban areas. Understanding where people move to would help to assess the kind of support IDPs may need to achieve durable solutions, facilitate the allocation of resources and avoid the duplication of interventions.

RECOMMENDATION

Information should be collected not only on where people are displaced from, but also where they take refuge. This should include their type of accommodation and living arrangements, whether they are in evacuation centres, renting a home or staying with friends, family or host communities.

Data should ideally be collected at the most local administrative level possible, georeferenced with coordinates to allow more follow-up over space and time. Such information should be used with due regard for ethical questions of privacy and data protection.

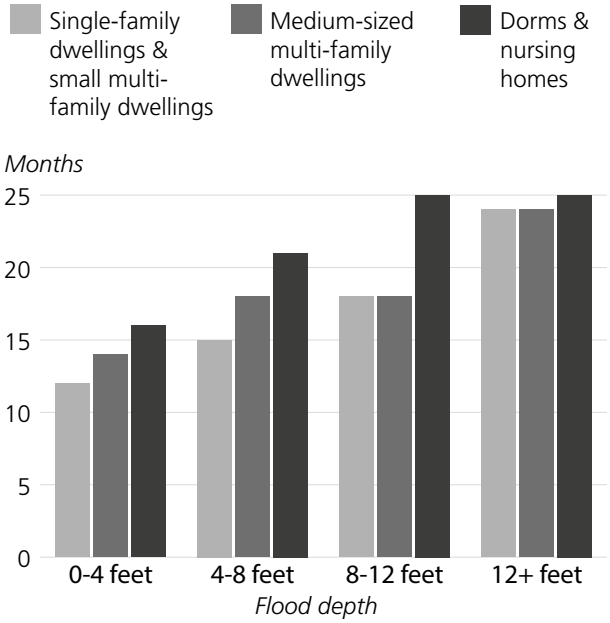
IMPACTS AND SEVERITY OF DISPLACEMENT

Understanding how IDPs' vulnerabilities differ from one situation to another, irrespective of scale, is important in painting a comprehensive picture of the severity of their displacement. It is also vital to inform effective and targeted planning and responses to help bring displacement to a sustainable end, and to focus attention, political will and resources where they are most needed.

Such assessments are challenging, however, mainly because of the absence of reliable data on the duration of displacement and the different coping capacities of individuals, communities and states. Some people are able to return shortly after a disaster strikes, but many remain displaced for months or even years and struggle to restore or rebuild their homes, land and property. Many IDPs also lose part or all of their income as result of their displacement, which weakens their resilience to future shocks.

IDMC tries to collect as much information as possible on housing destruction for each disaster event it records, whether as a proxy or for triangulation purposes. The extent of housing destruction is a good proxy for the magnitude of displacement. Depending on national indicators such as insurance penetration or construction costs, it is also possible to extrapolate the duration and the extent of economic disruption linked to the disaster. The duration of displacement can be used as an indicator of people's vulnerability (see figure 18).

FIGURE 18: Expected recovery time by building type affected by floods in the US



Source: FEMA/Hazus

Where no specific indicators exist to monitor disaster displacement, states could still report on others established by the Sendai framework and SDGs without duplication of effort. Target B of the Sendai framework, example, includes the "number of directly affected people attributed to disasters". It is linked to SDG targets 1.5, 11.5 and 13.1, which refer to monitoring and reporting on the "number of people whose destroyed dwellings were attributed to disasters". Sendai's target G and particularly G-6 could be also monitored using data on pre-emptive evacuations.[62]

RECOMMENDATION

IDPs' social and economic conditions before, during and after a disaster should be considered and monitored over time and space to understand the different impacts of displacement on individuals and groups. Determining whether displacement took place as part of a pre-emptive evacuation or during or after a disaster would also help to understand it impacts and severity, as would the systematic recording of data on housing destruction.

Displacement figures inferred by housing destruction should not be added to those on human mobility such as evacuations. If only one figure can be retained, it should be the highest.

SLOW-ONSET HAZARDS

Displacement associated with slow-onset hazards is difficult to monitor, but doing so is nonetheless important, particularly given the potential impacts of climate change and their implications for the livelihoods and resilience of those forced to flee.

RECOMMENDATION

New data sources, including satellite imagery and mobile phones should be exploited, and better access to information from Earth observations and climate models ensured. The resolution of risk assessments should also be increased, data inputs improved, particularly on demographics, and investments made in robust system dynamics and agent-based models.

Significant national and international investment is also needed in systematically recording pre-emptive evacuations, spontaneous and planned movements during drought or other extreme events associated with slow-onset hazards, planned relocations and returns. This needs to happen at regular intervals before, during and after events.

National ownership and accountability for data collection, analysis and reporting on slow-onset displacement should be increased by integrating it into governments' reports on progress toward meeting SDGs and the Sendai framework targets. Questions on displacement should be included in national censuses and other official surveys.

CROSS-BORDER MOVEMENTS

Cross-border disaster displacement is underreported, which potentially leaves vulnerable people who flee abroad with little or no protection or assistance. An internal IDMC analysis identifies three major challenges in monitoring this phenomenon.

First, information is scarce and often anecdotal. Nor is reporting on cross-border and internal disaster displacement harmonised or synthesised, which makes it difficult to identify those who have fled abroad, let alone target them with appropriate humanitarian support.

Second, the terms, definitions and units of measurement used to monitor these movements are not consistent. Without clear standardisation and definitions, there can be no globally recognised system and units of measurement for reporting the number of people who have been displaced across borders. Annex 2 sets out a non-exhaustive list of terms used to refer to this type of displacement.

Third, the time-lag in cross-border displacement caused by slow-onset disasters means that it may not be attributed to a specific event. Continuous exposure to hazard may increase people's vulnerability over time, leading eventually to their leaving the country.

RECOMMENDATION

Information on cross-border inflows and outflows should be collected using common terminology. It should include the main causes and data disaggregated by age, sex, and other socioeconomic characteristics. This would help to understand the situation of vulnerable groups and the different factors that influence their displacement.

THE RISK OF FUTURE DISPLACEMENT

UNDRR emphasises that "most disasters that could happen have not happened yet", and many governments and operational stakeholders recognise the need to understand future displacement risk.[63] Demand for models and tools to estimate the potential scale and severity of future displacement is growing, but their development and improvement takes time.

Estimating displacement risk using probabilistic approaches requires highly localised and detailed information. Many governments, however, lack the data needed to validate risk models and conduct full quantitative assessments. More capacity-building is also needed before they will be able to adapt models to their own needs and apply the results to policy development and investment planning.

IDMC has developed what is to date the world's only probabilistic model for estimating disaster displacement risk associated with a range of sudden-onset hazards. The first iteration was based on UNDRR's global model and calculates the average number of people likely to be displaced in any year in the future by earthquakes, tsunamis, floods, cyclones and storm surges.[64] Results show that a global average of around 14 million people are likely to be displaced each year.[65]

To estimate displacement risk, the model examines three main components: hazard, exposure and vulnerability (see figure 19). It first assesses future scenarios and intensities for different hazards, and then the assets and people exposed to those hazards. It looks only at housing on the basis that severe damage or destruction will force people to flee. The model then considers the structural vulnerability of buildings based on construction materials to estimate the probability of collapse. Together the three assessments can used to calculate the number of people likely to be made homeless, putting them at risk of displacement.

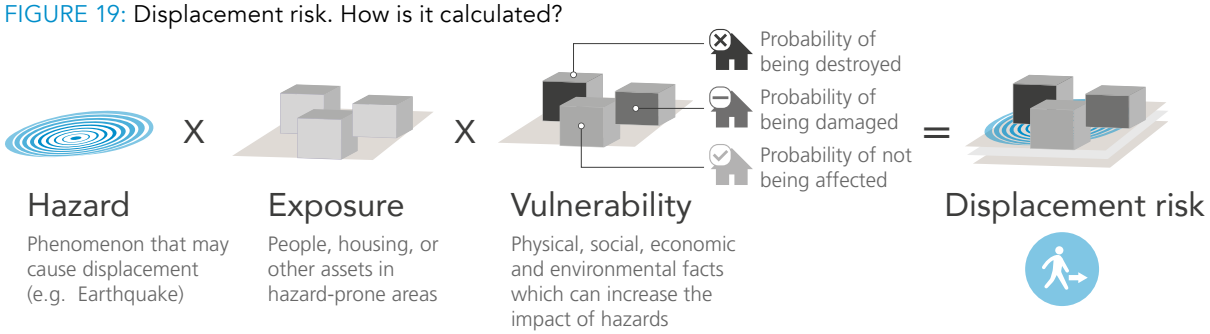
The model excludes displacements associated with pre-emptive evacuations, so the estimates it generates are inherently conservative. In countries with strong disaster preparedness capacity, such as Bangladesh, China, Cuba, Japan and Viet Nam, it significantly underestimates the number of historically reported displacements. For countries with less capacity and hazards such as earthquakes for which the possibility of early warning is extremely limited, its estimates are a closer fit with the historical data.

IDMC's model provides a benchmark for measuring progress toward disaster risk reduction, including against international frameworks such as the Sendai framework and the Paris Agreement on climate change. The model's evidence can be used to inform national and local disaster risk reduction policies and investments, and to identify areas where large numbers of people are at risk of losing their home.

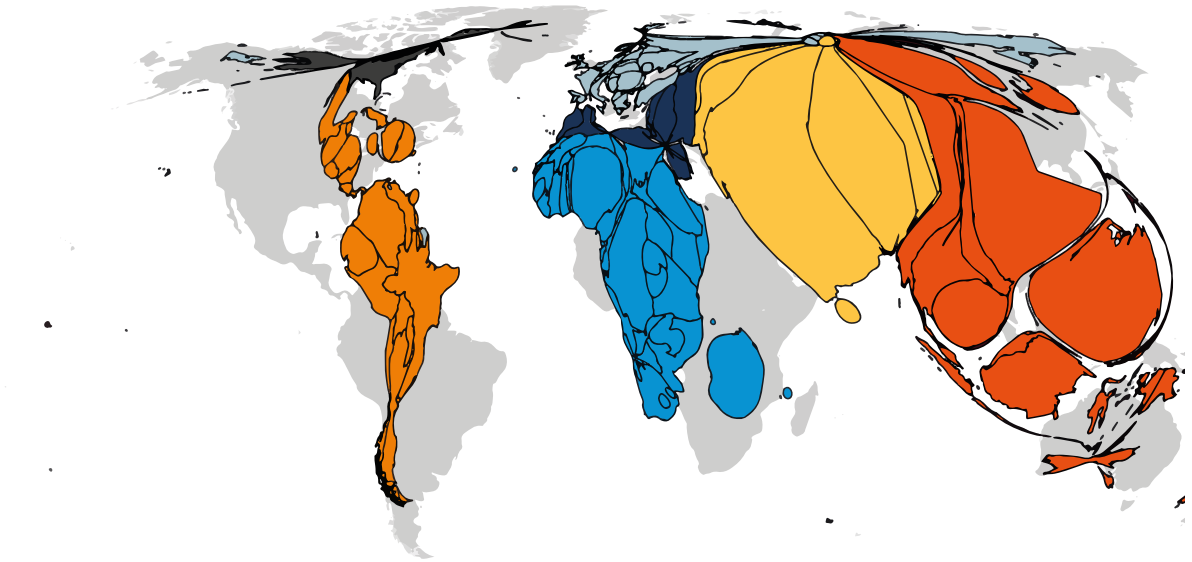
Estimates of displacement risk also help to determine the required capacities for evacuation centres and the amount of assistance needed to support those displaced. The model can also be adapted to support operations in real time by indicating the number and location of damaged and destroyed homes caused by modelled or observed hazards. It will soon include a more detailed layer on exposure to risk and more vulnerability components, including socioeconomic indicators.[66]

IDMC has also worked closely with the Swiss Federal Institute of Technology in Zurich (ETHZ) to improve the model's ability to predict flood displacement risk. Increasing the resolution of the exposure layer from five square kilometres to one allows for a more granular assessment of the people and assets exposed. This, coupled with a re-run of hazard scenarios using the latest technologies has produced a more accurate estimate that suggests the number of people at risk of displacement by floods is significantly higher than previously thought. Better resolution of the model also allowed the disaggregation of displacement flood risk figures by urban and rural locations.

FIGURE 19: Displacement risk. How is it calculated?



MAP 2: Average annual displacement by country and region



Source: IDMC with World Bank data

RECOMMENDATION

IDMC encourages countries to adapt its disaster displacement risk model at a lower, more granular scale to inform national and local disaster risk reduction policies and investments, and to identify areas where large numbers of people face the risk of homelessness and displacement.

Investments should also be made in understanding disaster risk in all its dimensions – the exposure and vulnerability of people and assets, hazard characteristics, response capacity and environmental factors. Such understanding would also support the development and implementation of preparedness measures and effective responses that build back better.

CONCLUSION

Disaster displacement is one of the most important humanitarian and development challenges we face in the 21st century. If we are to rise to it and make sure our policies and investments reach the most vulnerable, we need data and evidence to inform them. This report identifies many of the main gaps in disaster displacement data and provides recommendations to fill them. Given the complexity and global nature of the challenge, we need to focus our collective attention on a few key priority areas.

We need to recognise that disaster displacement lasts well beyond the emergency response phase of a crisis. Understanding the scale and needs of those displaced for weeks, months and years will require data collection that continues over a significantly longer period of time than is currently the case. Understanding the impact of disaster displacement not only on humanitarian budgets but also on development investments will be vital to inform local and national planning.

We must reinforce agreements between states on disaster management and risk reduction and emergency responses, and ensure that all stakeholders, from local NGOs and authorities to international NGOs and the UN agree to share data openly. We also need global standards and guidance to make the data collected by a range of stakeholders for a variety of reasons more consistent, comparable, interoperable and useful to decision-makers. The collection of disaster displacement data can be aligned with reporting on the Sendai framework, SDGs and other global commitments.

This will require training on key concepts and definitions, improved coordination and the scaling up of good practices. Disaster loss databases should include core indicators on displacement, such as the number of people evacuated before, during and after a disaster and the number of damaged and destroyed homes, which can be linked to monitoring and reporting systems on disaster displacement as well as displacement risk models.

More effort is also needed to capture small-scale events, which are often invisible beyond the immediate areas in which they take place and the places to which people are displaced. They seldom generate a significant response, leaving those displaced to fend for themselves. This sets up a vicious cycle in which impoverished people "recover" from displacement by returning to or reconstructing vulnerable homes in hazard-prone areas. We also need data about small-scale events to assess future displacement risk, learn more about where it is high and provide information that guides investments to reduce it.

More data collection and better coordination require additional investment and innovative approaches, in many cases to build on existing solutions or adapt tools and technology already used in other disciplines. This is the case, for example, for risk and hazard-impact modelling, computer image recognition and natural language processing.

Such investment is vital and likely to generate significant and perhaps unexpected benefits and savings. We can already be sure that the resulting data will have enormous value in informing policies to prevent displacement and avoiding the cost of responding to it. Any new tools and approaches also have the potential to be adapted to meet challenges in other sectors, such as public health, education and urban planning.

Technological advances and growing international recognition of the magnitude and increasing risk of disaster displacement mean the time is right for more and better coordinated action to build on the good practices and address the gaps highlighted in this report. Disaster displacement risk exists in every country in the world. Now is the moment to show our collective commitment to leave no one behind.

ANNEXES

ANNEX 1: CASE STUDIES ON CROSS-BORDER DISPLACEMENT

SUDDEN-ONSET DISASTERS

HAITI

Hurricane Matthew, September 2016

Haiti has a population of just over 10,700,000 people and is the sixth most densely populated country in Latin America and the Caribbean. It is also one of the most vulnerable to the effects of natural hazards such as storms, floods, landslides and drought.[67] An powerful earthquake displaced 2.3 million people and affected almost 3.5 million people in 2010.[68] Drought caused by the El Niño climate pattern affected more than a million in 2016.[69]

The humanitarian situation was aggravated further in October 2016 when hurricane Matthew, a category four hurricane and one of the worst storms in a decade, struck. Matthew destroyed property across large swathes of the southern Haiti, affecting 2.1 million people and displacing around 176,000.[70] In its wake, countries including the US, Mexico and Costa Rica suspended the deportation of Haitians with irregular migration status or offered them humanitarian visas to regularise their situation.[71] Other Caribbean and South American countries did similarly and provided humanitarian protection and assistance.

CROSS-BORDER DISPLACEMENT

Haiti's economic and political instability, as well as its exposure and vulnerability to natural hazards, had driven people to leave the country in significant numbers even before the 2010 earthquake.[72] The outflow increased following the earthquake, however, and some sources suggest that it did so again after the destruction wrought by Matthew.[73]

The literature identifies four waves of cross-border displacement from Haiti:

- Haitians displacing to the US to request temporary protected status (TPS) after the 2010 earthquake
  - Several media reports mention the inflow of Haitians to Central America countries in transit to the USA to request TPS.[74]

- Haitians in the US who were granted TPS after the 2010 earthquake and whose status was renewed after Matthew, considered as displaced across a border by the Nansen Initiative's Protection Agenda
  - 50,000 people granted TPS after the earthquake had their status extended until 2017.[75]

- Haitians displacing to the Dominican Republic in search of safety ahead of Matthew's landfall
  - Dozens of people sought safety in the Dominican Republic, but they were returned to Haiti.[76]

- Haitians displacing to Brazil and other South American countries
  - Several media reports document an increase in the inflow of Haitians to Brazil following the earthquake. Around 80,000 citizens from Haiti were granted with Humanitarian visas in Brazil after the landing of Hurricane Matthew.[77]
  - Media reports also document an increase in inflows of Haitians to Chile both after the earthquake and Matthew.[78]

HAITI

GAPS AND CHALLENGES:

Data gaps

- A lack of consistent reporting and documentation of incidents of cross-border displacement and the number of beneficiaries of humanitarian visas in transit and destination countries
- A lack of data and information about the number of people in transit countries
- A lack of data about the number of people in temporary shelters or collective centres in transit and destination countries[79]

Monitoring challenges

- The multi-dimensional crisis in Haiti and the various displacements of Haitians trying to reach countries offering assistance such as TPS or humanitarian visas make monitoring disaster displacements and secondary movements challenging.
- The lack of systematic documentation of population outflows from Haiti makes it difficult to be sure which caseloads of cross-border movement were triggered by which disaster. The same challenge applies in transit and host countries.
- Anecdotal media reports on cross-border movements use different terminologies, such as migrant, refugee or asylum seeker, which complicates the analysis of such movements.
- There is a general lack of information about the number of people displaced in transit and host countries.
- There is a shortage of regional approaches to assist this vulnerable population.
- The governments of Panama and Costa Rica have expressed their intention to look for third countries to relocate Haitians from their territory to. It is not clear, however, if this relocation will be forced or voluntary, which will affect monitoring.[80]

Summary:

Event name: Hurricane Matthew
Number of IDPs: 176,000 people as of November 2016[81]
Year: 2016
Country affected: Haiti
Reporting sources: Local, international media and the US Office of the Federal Register
Type of source: Media and US national authorities
Frequency of reporting: No regular reporting
Terminology used to report the cross-border population: Illegal migrants and TPS (US)
Number of people displaced across borders: More than 54,000
- 50,000 TPS beneficiaries
- 4,000 migrants in Mexico in transit to the US to seek TPS
- Dozens of people tried to find safety in the Dominican Republic before Matthew struck but were sent back to Haiti.

Cross-border displacement drivers: Economic and general insecurity, state fragility, high exposure and vulnerability to natural hazards
Type of people displaced across borders:
- Haitians who were abroad when the disaster hit and could apply for protection in host or third country
- Haitians affected by the disaster who were displaced cross-border

Country of transit or destination: Argentina[82], Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Mexico, Panama, Puerto Rico, United States of America

SOMALIA

Drought, 2015 and 2016

Thousands of pastoralists arrived in Djibouti from the Somaliland region of Somalia and the Somali region of Ethiopia from January 2016, fleeing one of the worst droughts of the last decade and protracted conflict. Many pregnant women and children under five among those displaced showed signs of acute malnutrition and anaemia. Half of the adult men and women were underweight and many were suffering chronic coughs, tuberculosis and diarrhoeal diseases.

There were 9,650 displaced pastoralists in settlement sites in the Ali-Sabieh, Dickhil and Obock regions of Djibouti by April 2016. Their arrival put additional pressure on local people who were already affected by two decades of recurrent drought and overstretched social services.[83]

CROSS-BORDER DISPLACEMENT

Djibouti is an important destination country for asylum seekers and refugees fleeing insecurity, persecution, disasters and endemic poverty and persecution in Eritrea, Ethiopia, Somalia and Yemen. There were 22,997 registered refugees and asylum seekers in Djibouti as of March 2016, 12,674 from Somalia, 6,766 from Yemen, 2,500 from Ethiopia, 1,000 from Eritrea and 57 from other countries. Another 35,862 people of mixed nationalities have arrived in Djibouti since the crisis in Yemen began in March 2015, most of them continuing their journey to other countries.[84]

GAPS AND CHALLENGES:

- No official figures for pastoralists whose displacement was triggered by drought are available from the Ethiopian and Somalian governments, as the issue was not officially recognised.

- This is a multi-dimensional issue, because there are other forms of cross-border displacement into Djibouti caused by economic factors and conflicts in countries where climate change and disasters intensify the risks people face. The drivers of displacement in the Horn of Africa are complex and multi-causal, making them difficult to understand. When the most visible or proximate driver of cross-border displacement is a disaster, other underlying drivers such as conflict or violence, which may support refugee claims, are often overlooked.[85]

Summary

Event name: Somalia drought
Number of IDPs: None
Year: 2015 and 2016
Countries affected: Somalia, Ethiopia
Reporting sources WFP
Type of source: UN

Frequency of reporting: Mentioned once
Terminology used to report the cross-border population: Displaced
Number of people displaced across borders: 10,000
Refugees and asylum seekers in Djibouti: 22,997

Cross-border displacement drivers: Drought
Type of people displaced across borders:
- Somalian and Ethiopian citizens affected by drought and conflict displaced across the Djibouti border

Country destination: Djibouti

ANNEX 2: REPORTING TERMS FOR CROSS-BORDER DISPLACEMENT

Term	Found in	Notes, examples and links
[Disaster type] refugee	Media	Drought refugees is used in Indian and Ethiopian media Ethiopian New Agency, 2016; The Hindu,2016
Climate displacees	Media	The term was found in media publications The verb, 2016; Climate visuals, 2018
People displaced in the context of disasters and climate change	UNHCR	UNHCR, 2017
Climate migrant	Academia, media and UN	IOM, 2009; IOM, 2016; Mahnke, 2013
Climate migration	Academia, media and UN	References to climate migration are extensive UNFCCC, 2016; Warren, 2016; The Guardian, 2015
Climate-displaced persons	Media, NGOs and UN	The rights of climate-displaced persons - a quick guide UNFCCC, 2015; Displacement Solutions, 2015.
Climate-Induced migration	Academia	A common term in academic publications GoogleScholar search «Climate-Induced migration»
Cross-border pastoral displacement	UN and media	Not a common term, but used by OCHA, 2010
Disaster-induced migration	Academia	A common term in academic publications GoogleScholar search «Disaster-induced migration»
Drought migrants	Media	Drought migrants flee to India's cities IRIN, 2016
Ecological migrants	National government and media	Term used by Georgia's agriculture ministry, N.A.
Environmental international migration	Media	"Environmental international migration pull factor are gentler Environment in terms of attractive climate and living conditions and opportunities of livelihoods" FAIR, 2016
Climate refugees	Academia, media and international organisations	Various publications use the term IOM,2016; Apap, 2019; GoogleScholar search «climate refugee»
Environmental refugee	Academia, media and UN	UNHCR, 2001
Environmental migration	Academia, media and UN	IOM,2016
Humanitarian visa beneficiaries from natural disasters	National government	Term used by the US Congressional Research Service in relation to TPS Congressional Research Service, 2016
Immigration Relief	National government	Term used by the US Department of Homeland Security USCIS, 2016
Labour migrants	Media and UN	Nepal and Labor Migration after the 2015 Earthquake UN WOMEN, 2015
Stranded people	National government	"The Prime Minister directed that in addition to the air route, the road route should also be used for evacuating stranded people at the earliest." Indian home affairs ministry, April 2016

NOTES

1. See: IDMC, "Global Internal Displacement Database"
2. See: IDMC, "Global Report on Internal Displacement"
3. IOM Haiti, "2010 Earthquake"; IOM Haiti, "DTM Report package - EQ2010", 1 May 2018
4. RNZ, "45 percent of Tuvalu population displaced – PM", 15 March 2015
5. Reuters, "Red Cross launches $7 mln appeal for Fiji after Cyclone Winston", 1 March 2016; UN OCHA, "Fiji: Severe Tropical Cyclone Winston Situation Report No. 8", 28 February 2016
6. UN OCHA, "Dominica Flash Appeal – Hurricane Maria: September to December 2017", 29 September 2017
7. RNZ, "Yutu confirmed as strongest typhoon to hit CNMI in 56 years", 21 December 2018, RNZ, "CNMI still on the road to recovery", 28 December 2018
8. IDMC, "GRID 2018", 2018
9. UNDRR, "Terminology", 2 February 2017
10. The Nansen Initiative, "Global Consultation, Conference Report", December 2015
11. *Ibid.*
12. UNOCHA, "Guiding principles on Internal Displacement", August 1998
13. UNDRR, "Terminology", 2 February 2017
14. IDMC, "Global estimates 2015: people displaced by disasters", 13 July 2015
15. IDMC, "Internal displacement and vulnerability of pastoralist communities in northern Kenya", October 2012
16. IDMC, "Assessing Drought Displacement Risk for Kenyan, Ethiopian and Somali Pastoralists", 26 April 2014
17. IPCC, "AR5 Synthesis Report: Climate Change 2014", October 2014
18. UNHCR, "IASC Framework on durable solutions for internally displaced persons", April 2010
19. Cernea, M., Maldonado, J., "Challenging the prevailing paradigm of displacement and resettlement" Routledge, 2018
20. The Nansen Initiative, "Agenda for the protection of cross-border displaced persons in the context of disasters and climate change", December 2018
21. IDMC, "IDMC strategy 2015 to 2020", December 2014
22. IDMC, "A Humanitarian Crisis in Need of a Development Solution", 2012
23. UNOCHA, "Haiti: US$252.2M Needed to Reach 2.2 Million People with Life-Saving Aid in 2018", 12 January 2018
24. UNDRR "Country Document for Disaster Risk Reduction: Haiti 2016", 2017
25. Stephens, T., Dy, P., "The Typhoon Haiyan Response: Strengthening Coordination among Philippine Government, Civil Society and International Actors", Harvard Kennedy School Program on Crisis Leadership, March 2016
26. IDMC, "Challenging the Picture of Disaster-Induced Displacement: The Evolving Reality Post-Typhoon Haiyan", May 2014
27. Sherwood, A., Bradley, M., Rossi, L., Guiam, R., Mellicker, B., "Resolving Post-Disaster Displacement: Insights from the Philippines after Typhoon Haiyan", Brookings, IOM, 2015
28. Philippine National Housing Authority, "Resettlement"; Philippine National Economic and Development Authority, "Yolanda Updates Selected Remaining Deliverables per Cluster", March 2017
29. UNDRR "Words Into Action Guidelines", 2018
30. See: UN, "Sustainable Development Goals Knowledge Platform"
31. UNFCCC, "Task Force on Displacement"
32. UNFCCC, "Report of the Conference of the Parties on its twenty-fourth session, held in Katowice from 2 to 15 December 2018", 19 Mar 2019
33. IDMC, "Briefing Paper. Leaving no-one behind: Internal Displacement and the New Urban Agenda", 11 October 2016
34. Agenda for Humanity, "The Grand Bargain, A Shared Commitment to Better Serve People in Need", 23 May 2016
35. United Nations, "Global Compact"; Kälin W., "The Global Compact on Migration: A Ray of Hope for Disaster-Displaced Persons", 15 December 2018
36. UNDRR, "Sendai Framework for Disaster Risk Reduction 2015-2030", 18 March 2015
37. UN, "Cuba: Hurricane Irma, Three Month Report", 15 December 2017
38. UN, "Cuba: A Model in Hurricane Risk Management", 14 September 2004
39. See: IDMC, "Economic Impacts of Displacement"
40. IDMC, "Unveiling the cost of internal displacement", The ripple effect: economic impacts of internal displacement, February 2019
41. IDMC, "Lost productivity due to internal displacement, the 2015 earthquake in Nepal", The ripple effect: economic impacts of internal displacement, June 2018
42. IDMC, "Lost Production Due to Internal Displacement, Cuba, 2018: Hurricane Ike", The ripple effect: economic impacts of internal displacement, March 2019
43. UN Economic and Social Council, "Report of Statistics Norway, the Turkish Statistical Institute, Eurostat and the Office of the United Nations High Commissioner for Refugees on progress in the work on statistics on refugees and internally displaced persons", 11 March 2016
44. Expert Group on Refugee and Internally Displaced Persons Statistics, "Technical Report on Statistics of Internally Displaced Persons: Current Practice and Recommendations for Improvement", 9 March 2018
45. *Ibid.*
46. *Ibid.*
47. *Ibid.*
48. UNDRR, "Terminology", 2 February 2017
49. *Ibid.*
50. IDMC, "Driving Global Efforts to Reduce Global Displacement: Thoughts from Istanbul", May 2016
51. OHCHR, "Resolutions of the Human Rights Council, previous Commission on Human Rights, and the General Assembly on internally displaced persons"
52. IDMC, "GRID 2018", 2018
53. See: IDMC, "Global Internal Displacement Database"; EM-DAT, "The International Disaster Database"
54. UNDRR, GAR 2015 consolidated database, accessed 2 May 2019
55. *Ibid.*
56. Centre for Humanitarian Data, "IOM and OCHA: Partners In Displacement Data", 28 June 2018
57. Expert Group on Refugees and IDPs Statistics, "Technical Report on Statistics of Internally Displaced Persons: Current Practice and Recommendations for Improvement", March 2018.
58. UNDRR "Words Into Action Guidelines", 2019
59. Centre for Humanitarian Data, "Providing Metadata For Your Datasets On HDX", 16 July 2018
60. Expert Group on Refugees and IDPs Statistics, "Technical Report on Statistics of Internally Displaced Persons: Current Practice and Recommendations for Improvement", March 2018.
61. *Ibid.*
62. UNDRR, "Technical Guidance for Monitoring and Reporting on Progress in Achieving the Global Targets of the Sendai Framework for Disaster Risk Reduction", December 2017, page 156
63. UNDRR, "Global Assessment Report on Disaster Risk Reduction 2015", 2015
64. UNDRR, "Global Assessment Report on Disaster Risk Reduction: Unveiling Global Disaster Risk"
65. IDMC, "Global Disaster Displacement Risk – A Baseline For Future Work", October 2017
66. *Ibid.*

67. Index for Risk Management, "INFORM country risk profiles for 191 countries: Haiti", 2019
68. UN Secretary-General, "Humanitarian assistance, emergency relief, rehabilitation, recovery and reconstruction in response to the humanitarian emergency in Haiti, including the devastating effects of the earthquake - Report of the Secretary-General", 2 September 2011
69. WFP, "El Niño, Drought Blamed As Severe Food Insecurity Doubles In 6 Months In Haiti", 2016
70. Channel News Asia, "Hurricane Matthew takes aim at Bahamas, Florida gets ready", 6 October 2016
71. Economia Hoy, "México dará permiso temporal a migrantes haitianos por Matthew", 14 October 2016; Costa Rica Gobierno, "Costa Rica Suspende Deportacion De Haitianos Por Efectos De Huracan Matthew"
72. UN University, IOM, ECHO, "Catastrophes, Changements Environnementaux et Migration: Apercus issus de milieu vulnérables en Haiti", 7 December 2016
73. Nieto, C., "Migración Haitiana A Brasil. Redes Migratorias Y Espacio Social Transnacional", Clasco, November 2014; IOM, "Diagnostico regional sobre migracion haitiana", August 2017
74. Reuters "Panama y Costa Rica buscaran salida internacional para oleada de inmigrantes haitianos", 7 October 2016
75. US Office of the Federal Register, "Beneficiaries of TPS can remain in US soil and benefit from working permits", 2016
76. 7 Dias, "Soldatos evitan haitianos penetren al pais por Dabajon", 5 October 2016
77. Harumi Miura, H., "The Haitian Migration Flow to Brazil: Aftermath of the 2010 Earthquake", September 2014; BBC, "Cidade no Mato Grosso do Sul vira nova porta de entrada para haitianos", 24 August 2018; Agencia Brasil, "Cinco años apos tremor no Haití, SP e Acre tem problemas para receber imigrantes", 12 January 2015; Government of Brazil, "Governo prorroga visto humanitário para haitianos", 14 September 2016
78. Inter Press Service, "Chile, un oasis para los haitianos que comienza a secarse", 27 April 2018
79. IOM, "La migración haitiana hacia Brasil: Características, oportunidades y desafíos", Cuadernos Migratorios no.6, July 2014; CEM, "Estudio Sobre Las Casas De Migrantes Católicas", 1 June 2017
80. El Diario, "Panamá y Costa Rica piden a otros países acoger a migrantes haitianos varados", 7 October 2016
81. OCHA, "Hurricane Matthew Snapshot", 16 November 2016
82. IOM, "Diagnostico regional sobre migración haitiana", August 2017
83. WFP, "EU Supports WFP Assistance To Thousands Suffering Drought & Displacement In Djibouti", 3 October 2016
84. WFP, "Djibouti Country Brief, December 2018", 31 December 2018
85. UNHCR, "In Harm's Way: International protection in the context of nexus dynamics between conflict or violence and disaster or climate change", Legal and Protection Policy Research Series, December 2018

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