



Global Estimates 2014

People displaced by disasters

NRC

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Global Estimates 2014

People displaced by disasters

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Cover photo: A woman carries her baby across an area damaged by Typhoon Haiyan at Tacloban city, Leyte province, central Philippines. Four days after Typhoon Haiyan, one of the strongest storms on record, struck the eastern Philippines, assistance is only just beginning to arrive. (*Photo: AP Photo/Aaron Favila, November 2013*)

Please note: The global, regional and national estimates provided in this report are based on information available to IDMC on the overall scale of displacement related to disasters as of 22 August 2014. Where new information becomes available, the IDMC dataset is updated. Revisions to aggregate figures are reflected in the following year's report.

All 2013 disasters that displaced at least 100,000 people are listed in Annexe B to this report. In the body of this report, figures of 10,000 and over have been rounded to the nearest 1,000; figures of 1,000 and less have been rounded to the nearest 100. Data on all disaster-induced displacement events for each year since 2008 including sources of information used is available upon request. Please email: idmc@nrc.ch

Erratum (30 September 2014): Please note, following the publication of this report, the displacement estimate related to severe storms and tornadoes (and related flash floods) in Oklahoma state, USA (19 May - 2 June 2013) was corrected to 10,000. (Source of data: TDA inc., Oklahoma Tornado Disaster and Related Events, Final Report (to US Department of Housing and Development), August 6, 2013; and Oklahoma Department of Emergency Management (OEM) Situation Update 3, 2 June 2013). Please visit the IDMC website to download the latest version of the 2013 dataset.

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Acronyms

ADRC	Asian Disaster Reduction Centre	NDRRMC	National Disaster Risk Reduction and Management Council
AFP	Agence France-Presse	NEMA	National Emergency Management Authority
CAR	Central African Republic	NEOC	National Emergency Operations Centre
CCCM	Camp Coordination and Camp Management (cluster)	NGO	Non Governmental Organisation
CCSFC	Central Committee for Storm and Flood Control	NRC	Norwegian Refugee Council
CRED	Centre for Research on the Epidemiology of Disasters	OCHA	Office of the High Commissioner for the Coordination of Humanitarian Affairs (UN)
DMC	Disaster Management Centre	OHCHR	Office of the High Commissioner for Human Rights (UN)
FDMA	Fire and Disaster Management Authority	SIDS	Small Island Developing States
FEMA	Federal Emergency Management Agency	SSRRC	South Sudan Relief and Rehabilitation Commission
FEWS NET	Famine Early Warning Systems Network	UCDP	Uppsala Conflict Data Programme
DSWD	Department of Social Welfare and Development	UN	United Nations
HDI	Human Development Index	UNDESA	United Nations Department of Economic and Social Affairs
IDMC	Internal Displacement Monitoring Centre	UNDP	United Nations Development Programme
IDP	Internally Displaced People	UNHCR	Office of the United Nations High Commissioner for Refugees
IFRC	International Federation of Red Cross and Red Crescent Societies	UNICEF	United Nations International Children's Emergency Fund
IOM	International Organisation for Migration	UNISDR	United Nations Office for Disaster Risk Reduction
IPCC	Inter-governmental Panel on Climate Change	UNMISS	United Nations Mission in the Republic of South Sudan
LDCs	Least Developed Countries	WRI	World Risk Index
MCA	Ministry of Civil Affairs		
NCDM	National Committee for Disaster Management		
NDMA	National Disaster Management Authority		



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Foreword

***By Jan Egeland, secretary general of the Norwegian Refugee Council; and
Alfredo Zamudio, director of the Internal Displacement Monitoring Centre***

Displacement by disasters is a global phenomenon that is growing in scale and complexity. Since 2008, an average of 27 million people have been displaced annually by disasters brought on by natural hazards. The risk of such displacement is estimated to have doubled in the past 40 years.

We need coordinated approaches to prevent, manage and respond to this enormous challenge - and continued efforts to monitor and quantify it.

IDMC's Global Estimates report for 2013, the fifth of its kind, is an essential contribution to our knowledge of the scale and impacts of rapid-onset disasters. It provides a solid evidence base for understanding global patterns and trends in displacement, and to inform frameworks for the achievement of post-2015 goals on disaster risk reduction and sustainable development. It also underscores the need for climate change adaptation plans and donor commitments that give due attention to the increasing risk of displacement.

We very much hope that IDMC's findings will contribute to a global dialogue on the issues raised, and we encourage all governments to act decisively in their responses to disaster-induced internal displacement.



Jan Egeland

Jan Egeland
Secretary general of the Norwegian Refugee Council



Alfredo Zamudio

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Director of the Internal Displacement Monitoring Centre

Executive summary

Disasters brought on by natural hazards force millions of people to flee their homes each year across all regions of the world. The displacement caused is a global phenomenon, and its growing scale, frequency and complexity pose huge challenges for exposed and vulnerable populations, governments, humanitarian and development organisations and disaster risk managers.

As most disasters are as much man-made as they are natural, much more can be done in order to strengthen community-based and national resilience to prevent the worst impacts of natural hazards, and to better prepare for events that cannot be avoided. Policies and practice that protect and respect the rights of displaced people and those at risk of displacement, and that target their specific needs, can play a vital role in mitigating impacts, breaking recurrent patterns and avoiding protracted situations.

Now is an opportune moment for policymakers to ensure that displacement issues are better addressed in post-2015 goals and frameworks for international action on disaster risk reduction and sustainable development, which are currently under preparation. Governments must make certain that climate change adaptation plans and donor commitments give due attention to the increasing risk of displacement, including by facilitating migration and planned relocation in ways that respect the rights of vulnerable populations. Consultations ahead of the 2016 World Humanitarian Summit should also ensure that displacement is considered in the context of disasters, conflict and mixed crises.

Purpose and scope of this report

IDMC's Global Estimates report, the fifth of its kind, aims to equip governments, international and regional institutions and civil society with up-to-date estimates and analysis of the displacement disasters cause and to identify trends as the basis for evidence-based dialogue and decision-making. The report presents estimates for 2013, and for each of the five preceding years. It also uses a prototype method to model the broad, historical trend in displacement since 1970.

Our data for 2008 to 2013 identifies displacement in 161 countries, and the historical dataset includes disasters reported in 194 countries. Both include disasters associated with geophysical hazards such as earthquakes and volcanic eruptions, and weather-related hazards such as

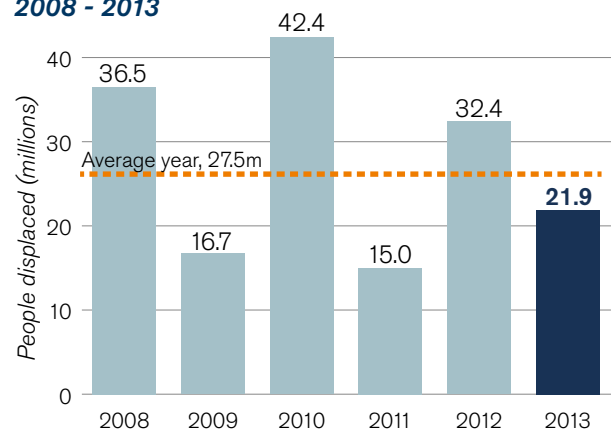
floods, storms, landslides, cold snaps and wildfires. The report also includes findings from countries where both natural hazards and conflict have caused displacement, with a spotlight on the complex and growing crisis in South Sudan.

Our Global Estimates reports do not capture figures for prolonged displacement following disasters in previous years, or for ongoing displacement over the year in which they started. Ad hoc case studies and reports exist on such situations, but post-emergency monitoring and reporting on protracted situations is generally poor and constitutes a significant global blind spot.

We arrived at our estimates for 2008 to 2013 by compiling, cross-checking and analysing reports from a wide range of sources, including governments, national disaster loss databases, humanitarian clusters and working groups, UN agencies, the International Organisation for Migration (IOM), the International Federation of Red Cross and Red Crescent Societies (IFRC), NGOs, research institutions, the media and private sector organisations. The methodologies used are detailed in annex A of the report.

The global scale of displacement: patterns and trends

The scale of global displacement by disasters, 2008 - 2013



Source: IDMC estimates as of 22 August 2014

2013

- Almost 22 million people were displaced in at least 119 countries, almost three times as many as were newly displaced by conflict and violence.



Women, walking with what possessions they can carry, arrive in a steady trickle at an IDP camp erected next to an AMISOM military base near the town of Jowhar, Somalia. Heavy rains in Somalia, coupled with recent disputes between clans, has resulted in over four thousand IDPs seeking shelter at an AMISOM military base near the town of Jowhar, with more arriving daily. AU UN IST Photo / Tobin Jones, November 2013

- Thirty-seven of the 600-plus recorded events involved the displacement of more than 100,000 people. Typhoon Haiyan, which caused the largest displacement of the year, forced a million more people to flee their homes in the Philippines than in Africa, the Americas, Europe and Oceania combined.
- Mass displacements are frequent in countries most exposed and vulnerable to natural hazards. In the Philippines, three major disasters struck in the space of four months - typhoon Haiyan displaced 4.1 million people, typhoon Trami 1.7 million and an earthquake in the Central Visayas region 349,000. The latter was the world's largest displacement of the year triggered by an earthquake.
- As in previous years, most of the largest displacements took place in populous Asian countries. Typhoons, floods and earthquakes in China and the Philippines accounted for 12 of the 20 largest displacements.
- Rainy season floods in sub-Saharan Africa triggered five of the 10 largest displacements relative to population size. Four took place in Niger, Chad, Sudan and South Sudan - neighbouring, semi-arid countries of the Sahel region with highly vulnerable populations who are also affected by drought and conflict. The fifth took place in Mozambique.
- The extent to which populations in the most developed countries are exposed to hazards also led to some of the world's largest displacements. Typhoon Man-yi in

the Chubu region of Japan displaced at least 260,000 people and floods in Alberta, Canada displaced 120,000.

2008 to 2013

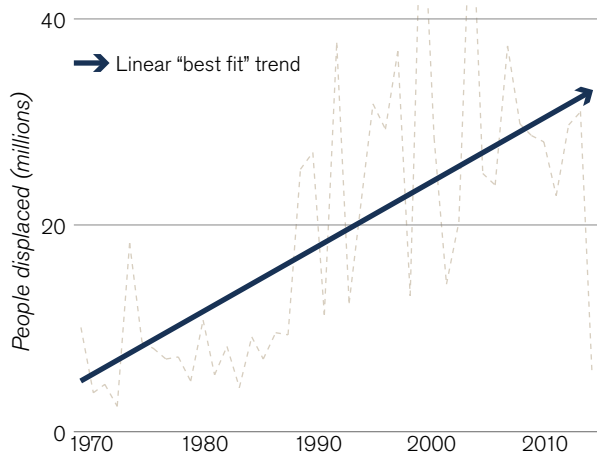
- Disasters displaced an average of 27 million people each year between 2008 and 2013. There are significant differences in the estimates from year to year, but the annual total has always exceeded 15 million.
- Major disasters are irregular and relatively infrequent, but they cause displacement on a vast scale when they do occur. Thirty-five disasters that each forced more than a million people to leave their homes accounted for 70 per cent of all displacement over the six-year period.
- Relatively small but far more frequent events tend to be under-reported. Figures for such events are, therefore, likely to be significant underestimates and their repeated and cumulative impacts are poorly understood. Increased investment in disaster risk reduction measures, such as better urban planning, the maintenance of flood defences and the introduction of building standards for housing and other infrastructure that can withstand smaller-scale hazards, could prevent or mitigate much of their impact.

Trends since 1970

- Significantly more people are displaced by disasters now than in the 1970s. In absolute terms, the risk of displacement is estimated to have more than doubled in four decades.

- A number of factors help to explain the rising trend:
 - More people are exposed to natural hazards and affected by disasters than 40 years ago, particularly in urban areas of more vulnerable countries. The global population has increased by 96 per cent since the 1970s, and urban populations have grown by 187 per cent. Urban populations in developing countries have risen by 326 per cent.
 - Improvements in disaster preparedness and response measures, including early warning systems and emergency evacuations, mean that more people now survive disasters – but many of the survivors are displaced.
 - The collection of data on disasters and the displacement they cause has improved. We know more about the impacts of disasters that occur now than we did about those that happened 40 years ago. That said, large gaps and significant variations in the quality of available information mean that data collection needs to be better still.

Modelled global trend in disaster-induced displacement, 1970-2012



Source: IDMC estimates as of 22 August 2014

Regional and national exposure and vulnerability

- Developing countries account for the vast majority of displacement caused by disasters each year - more than 85 per cent in 2013, and 97 per cent between 2008 and 2013. Those with the lowest development levels and small island developing states are particularly vulnerable and they are disproportionately represented among countries with the highest displacement figures in absolute terms or relative to their population sizes.
- Repeated events leave little time for recovery between one disaster and wave of displacement and the next.

Eighty-eight countries experienced a number of displacement events involving more than 10,000 people over the six-year period.

- The average number of people displaced by disasters has risen over the past four decades in all regions of the world, but the trend has been most marked in Asia. More vulnerable people are exposed to hazards there today than were 40 years ago, and it is the only region whose share of global displacement has exceeded its percentage of the world's population.
- Between 2008 and 2013, 80.9 per cent of displacement took place in Asia. The region accounted for the 14 largest displacements of 2013 and the five countries with the highest displacement levels: the Philippines, China, India, Bangladesh and Vietnam.
- Given that Africa's population is growing more quickly than other regions', people's exposure to hazards and displacement risk is expected to increase faster there in the coming decades. Its population is predicted to double by 2050.
- A small number of unexpectedly extreme hazards led to high levels of displacement in the Americas between 2008 and 2013. They included hurricane Sandy, which affected the US, Cuba and other countries in 2012, and the 2010 earthquakes in Haiti and Chile.
- Pacific island countries are disproportionately affected by disasters and the displacement they cause, because when a hazard strikes it can severely affect a very high proportion of their inhabitants. This pattern is also seen in small island developing states in other regions.
- Compared with other regions, Europe experienced lower levels of displacement relative to its population size between 2008 and 2013. That said, severe floods in central Europe, particularly Germany and the Czech Republic, and in Russia and the UK, made 2013 a peak year.

Displacement related to weather and geophysical hazards

- Weather-related hazards, particularly floods and storms, trigger most of the displacement induced by rapid-onset disasters almost every year. In 2013, such events triggered the displacement of 20.7 million people, or 94 per cent of the global total.
- Since 1970, displacement has increased with regard to both weather-related and geophysical hazards. Displacement due to weather-related hazards has increased more quickly, which corresponds to development and urban growth in areas exposed to cyclones and floods, particularly in Asia.
- Weather-related hazards are linked not only to normal variability in weather patterns, but also to long-term changes in the global climate that are expected to cause more frequent extreme weather events in the future. That said, changes in climate and weather patterns

over the next two or three decades will be relatively small compared with the normal year-to-year variability in extreme events. Near and medium-term trends in displacement associated with disasters will be driven by factors that increase the number of people who are exposed and vulnerable to hazards, more than by the hazards themselves.

- The quantification of displacement related to drought remains a global gap, which IDMC is attempting to address. We have piloted a new methodology and tool to estimate the historical displacement of pastoralists in the Horn of Africa, which could be applied to other regions and livelihoods affected by drought. Decision-makers could also use the tool to evaluate the potential effectiveness of investments under different climate and demographic scenarios.
- Unless action is taken to reduce disaster risk and to help communities adapt to changing weather patterns, we are likely to see much more displacement in the coming years and decades. Preventing and preparing for such population movements, and ensuring that lasting solutions are achieved for those who do become displaced, makes development sustainable.
- For increasing numbers of people living in areas prone to natural hazards, early warning systems and well-planned evacuations will become ever more important. Plans and measures to protect evacuees, especially the most vulnerable, should cover all phases of their displacement, until they have reintegrated safely and voluntarily in their home areas or settled in alternative locations.
- Policymakers should take care to ensure that national disaster risk reduction and climate change adaptation plans and measures incorporate the risk and impact of displacement. Many of those we analysed do not. Authorities should also ensure that their plans do not have the potential to cause displacement. They should avoid measures that arbitrarily displace people or require their permanent relocation without full respect for their human rights.

Countries with displacement caused by both conflict and disasters

- Those undertaking humanitarian and development initiatives should address complex displacement situations in countries affected by both conflict and natural hazards in a coherent and integrated way. In 33 out of 36 countries affected by armed conflict between 2008 and 2012, there were also reports of natural hazards forcing people to flee their homes. Measures to reduce disaster and displacement risk related to natural hazards may also reduce the risk of conflict driven by insecure livelihoods.
- The combination of conflict and natural hazards creates military and environmental obstacles to population

movements, isolating communities and limiting people's options in terms of flight and destinations. Particular attention should be paid to the protection of those who do not have the freedom to move to safer locations and who are at risk of being trapped in life-threatening situations, including those displaced to locations near to their homes.

- Many people who flee a combination of conflict and natural hazards suffer repeated displacement, including those who take refuge in areas where they are then exposed to further risk. Disaster risk reduction measures and community-based livelihood strategies are needed to enable people to adapt to new shocks, prepare for future ones and prevent repeated cycles of displacement.
- Some IDPs return home relatively quickly following a flood or other natural hazard, but others do not. People who remain displaced for prolonged periods and whose situations are unknown may be among the most vulnerable and in need of particular assistance and protection. Continued monitoring is needed to ensure that their situations are not neglected and that they are able to achieve durable solutions to their displacement.
- More comprehensive and reliable data is needed to improve knowledge of displacement dynamics when people are exposed to multiple hazards, with the aim of informing holistic responses that reflect the severity of such crises and prioritise the protection of those most in need.

Looking ahead

- Higher average levels of displacement are to be expected in the coming decades. As seen in past decades, demographic trends and vulnerability will continue to be the primary drivers of displacement risk, and changes in the frequency and intensity of extreme weather events are expected to add to this risk.
- The increase in the number of people exposed to hazards has outstripped authorities' ability to reduce the vulnerability of their populations, particularly in urban areas. To offset population growth, governments and their partners will need to step up efforts to reduce people's exposure and vulnerability by adopting and enforcing better land-use plans and building regulations, addressing income inequality and improving conditions for large populations living in informal settlements.
- The infrequent and random nature of the largest hazards makes annual displacement levels difficult to predict. This further highlights the need for greater investment in disaster risk reduction, climate change adaptation and preparedness measures that address people's underlying vulnerability to extreme weather patterns and the risk of major earthquake and volcano disasters.

1

Introduction

This annual report, the fifth of its kind, aims to equip governments, local authorities, civil society organisations and international and regional institutions with up-to-date estimates and analysis of the scale, patterns and trends in displacement caused by disasters worldwide, and so to inform evidence-based dialogue and decision-making. As Margareta Wahlström, the UN secretary general's special representative on disaster risk reduction, puts it: "What you can't measure, you can't manage." The UN deputy high commissioner for human rights, Flavia Pansieri, also points out that robust statistics are essential to translating human rights commitments into targeted policies, and to assessing their effectiveness: "If you don't count it, it won't count."¹

Global data from the past four decades shows that disasters brought on by natural hazards force millions of people to flee their homes each year. 2013 was no exception, with almost 22 million people displaced during the year. Displacement often plays a central role in people's response to disasters and the way in which crises evolve. The growing scale, frequency and complexity of the phenomenon across all regions of the world pose huge challenges for exposed and vulnerable populations, and for all those working to protect them and respond to their needs.

Those affected may be displaced short distances or far from their homes. For some, flight is a temporary measure lasting days or weeks, but for others it becomes prolonged or protracted. Repeated displacement is common in areas prone to hazards, and has cumulative impacts if recovery measures do not address the underlying vulnerability and strengthen the resilience of exposed populations. Displacement has a disproportionate effect on the most vulnerable men, women and children in both developed and developing countries, and not only on displaced people themselves. The families and communities with whom they seek refuge and in some cases permanent integration are also affected, as are those who may be left or choose to stay behind in their home areas.

Most disasters are as much man-made as they are natural. Much more can be done to prevent them from happening in the first place, to limit the amount of displacement they cause and to better prepare for that which is unavoidable. Policies and practice that respect the rights of people displaced and at risk of displacement, and which target their specific needs, can play a vital role in mitigating impacts, breaking recurrent patterns and

avoiding protracted situations. Unless they are properly addressed, such situations undermine development and increase the risk of future disasters.

Now is an opportune moment for policymakers to ensure that displacement issues are more fully incorporated into post-2015 frameworks and goals for international action on disaster risk reduction and sustainable development, which are currently under preparation. Governments must make certain that climate change adaptation plans and donor commitments give due attention to the increasing risk of displacement. This should include the facilitation of migration and planned relocation in ways that respect vulnerable populations' rights and involve them fully in the preparation and implementation of such measures. Consultations ahead of the 2016 World Humanitarian Summit should also ensure that displacement is considered in the context of disasters, conflict and mixed crises.

1.1 Scope and limitations of this report

The annual Global Estimates report provides up-to-date statistics on the incidence of new displacement caused by disasters associated with natural hazards worldwide. It presents figures for the total number of people displaced during each event or disaster period at the country, regional and global level alongside complementary evidence and analysis.

This year's report includes:

- High quality global estimates for events in 2013 and the five preceding years, including a spotlight on the disaster caused when typhoon Haiyan struck the Philippines in November 2013, the consequences of which are still ongoing (see sections 2.1 and 2.2). Displacement has occurred in 161 countries between 2008 and 2013, though not in every country each year, and in 119 countries during 2013 itself
- An estimate of the broad, historical global trend in displacement since 1970 (see sections 2.3 and 3)
- Coverage of the largest events and the countries with the highest levels of displacement (see sections 2.1, 2.2 and 3), and a discussion of smaller, under-reported events and their significance (see box 2.1)
- Estimates by event, country and region normalised by population size, in order to better compare the scale of displacement across countries of vastly different sizes. Country findings are also considered in relation to sources of vulnerability to displacement, including those

indicated by development and disaster risk indices (see section 3.2), and the importance of preparedness, including emergency evacuations (see box 4.1)

- Estimates for disasters associated with rapid-onset geophysical and weather-related hazards, such as floods, storms, earthquakes, volcanic eruptions, landslides, cold snaps and wildfires (see annex A, table A.1).
- Slow-onset hazards such as drought and environmental degradation are also significant drivers of displacement risk, but these phenomena are not included because a different methodology is required to analyse and quantify their impact. IDMC has developed such a methodology, and the issue, particularly as it relates to drought and pastoralist communities, is discussed in section 4.2
- Findings on countries affected by displacement caused by both natural hazards and conflict, with a spotlight on the complex and growing crisis in South Sudan (see section 5)
- A detailed explanation of the different methodologies used to develop our 2008 to 2013 and 43-year datasets (see annex A)
- A comprehensive list of the largest displacements in 2013 (see annex B)

We arrived at our estimates for 2008 to 2013 by compiling, analysing and cross-checking reports from a wide range of sources, including governments, national disaster loss databases, humanitarian clusters and working groups, UN agencies, the International Organisation for Migration (IOM), the International Federation of Red Cross and Red Crescent Societies (IFRC), NGOs, research institutions, the media and private sector organisations. We take an inclusive, global approach to identifying displacement, but the availability and quality of sources varies greatly between countries and events. The data we used was originally collected and published for a number of different purposes, and may not always have been gathered for statistical analysis of displacement. This creates a reporting bias towards countries with better and more accessible information, larger-scale events and internally displaced people (IDPs) living in formally monitored evacuation and shelter sites. The majority of those displaced, however, tend to take refuge in spontaneous, dispersed settings and with host families (see annex A).

Our Global Estimates reports do not capture figures for prolonged or ongoing displacement following disasters in previous years, or which continues to take place during the year in which they struck. Ad hoc case studies and reports on such situations do exist, but post-emergency monitoring and reporting is generally weak and constitutes a significant global blind spot. As such, the extent to which displaced people's movement patterns, transitional locations and destinations can be analysed statistically is highly limited.

The data for 2008 to 2013 highlights some important global patterns, but the six-year period is too short to understand displacement trends. In order to create a longer-term perspective, we used a complementary methodology to model historical displacement trends at the global and regional levels since 1970. The results of this prototype modelling, which are presented here for the first time, are based on global disaster loss data covering 194 countries, which we then calibrated with our higher resolution estimates for 2008 onwards. The methodology and its limitations are explained further in annex A.

Box 1.1: Key terms and concepts

Displacement refers to the involuntary or forced movement, evacuation or relocation of individuals or groups of people from their homes or places of habitual residence.² Many factors contribute to people becoming displaced, of which a natural hazard may be the most immediate and obvious trigger.

Displacement puts people at greater risk of impoverishment and discrimination, and creates specific needs among affected populations.³

The global estimates do not differentiate or quantify the number of people displaced either temporarily or permanently across internationally recognised state borders. It is widely recognised, however, that the vast majority who flee disasters remain within their country of residence. As set out in the Guiding Principles on Internal Displacement, they are described as **internally displaced people (IDPs)**.⁴

Displacement may take place over both short and long distances and include complex patterns of movement beyond initial flight. From their first place of refuge, such as an evacuation centre, IDPs may move to different transitional shelter sites and make temporary visits home before they are able to achieve a durable solution to their displacement (see section 4).

Evacuations.

People who evacuate their homes to avoid loss of life and exposure to serious and immediate harm in rapidly developing emergency or disaster situations are considered displaced. This includes anticipatory or pre-emptive evacuations. National and local authorities have primary responsibility for preparing for and implementing effective evacuations, sometimes with the support of national and international organisations. For evacuations to respect human rights and be lawful, they must be necessary to ensure the safety and health of those affected or at risk, and all measures must be taken to minimise displacement and its adverse effects (guiding principle 7).⁵

As such, evacuations, and particularly large-scale ones, should be undertaken as a measure of last resort, when sheltering in situ does not provide protection from the threat or would entail a higher risk than evacuating. Decisions on whether to evacuate or not may be different at different points in the evolution of a crisis. Evacuations are normally undertaken on the assumption that they will be short-lived, but safe, prompt and sustainable return depends of the effects of a disaster in home areas and prospects for recovery. As for IDPs in other situations, evacuees' rights and dignity should be respected in accordance with the Guiding Principles.⁶

Causes of displacement are multiple and often inter-related. This report focuses on disasters brought on by natural hazards, but it is also important to look beyond the immediate triggers of displacement to understand and address the underlying drivers of vulnerability and risk that both cause and result from it. People become displaced when a disaster renders them homeless by destroying their dwellings or making them uninhabitable, but they can also be forced to flee when other conditions vital to survival in their home areas, such as access to livelihoods and basic services, are severely disrupted, or when they are exposed to threats arising from deteriorating security.

Natural hazards are events or conditions that originate in the natural environment and may pose a severe or extreme threat to people and assets in exposed areas. They include geophysical, climate and weather-related events. The impact of natural hazards is often strongly influenced by human activity, including urban development, deforestation and dam water releases. Geographical location is important in determining the types of natural hazard to which a country is exposed.

Natural hazards vary greatly in terms of warning times, the speed of their onset and their duration, intensity and impacts. Approaches to mitigating impacts need to be tailored to each type of event and to the specific context of exposed areas, populations and assets.

A **disaster** is defined as the "serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources".⁷ They result from a combination of risk factors: the exposure of people and assets to single or multiple hazards, and pre-existing vulnerabilities including their lack of capacity to cope with shocks. Humanitarians use the term primarily in relation to natural hazards, but it

can also be applied to other types of crisis, such as those created by conflict. Displacement that takes place as a result of both natural hazards and conflict is discussed in section 5.

The difference between voluntary migration and forced displacement is difficult to distinguish in gradually evolving or chronic crisis situations. Rapid-onset hazards create a shock or crisis trigger to which displacement is a forced response. Hazards that evolve gradually, such as drought, combine with other factors to produce severe food and livelihood insecurity, and are less likely to be identified as a direct trigger or tipping point for displacement. Slow-onset hazards allow time for people at risk to consider their options, whether they have the means to avoid or prepare for the effects of a disaster before they reach a crisis point and become displaced. Migration may be undertaken as a pre-emptive or adaptive measure, and as such is a way of avoiding forced displacement.

Repeated and frequent displacement. Recurrent and frequent patterns of displacement and return are seen in countries that are highly exposed to natural hazards. Contrary to common assumptions arising from the widespread early returns that follow many rapid-onset disasters, many returnees do not achieve lasting solutions to their displacement. Statistics may also mask returns that are unsafe, unsustainable and in some cases forced. Return in and of itself is far from an end of the story if the risks of future disaster and displacement are not reduced. Repeated cycles of displacement have cumulative effects on vulnerability and resilience, driving further risk and setting back recovery and development efforts if left unmitigated. Repeated temporary displacement may indicate that people are trapped in unsustainable and deteriorating conditions. Those without the resources or assistance to consider relocating permanently to safer and more sustainable locations often undertake repeated movements over short distances.

Prolonged and protracted displacement. For many people who are displaced by disasters, the possibility of returning home is either significantly delayed or not an option (see section 2.1.3). A temporary evacuation may morph into prolonged displacement. People may also be displaced to areas where they continue to be exposed to similar or different hazards and risks (see section 5). People with the fewest resources and least capacity to mitigate and recover, and who are most vulnerable to human rights abuses, are disproportionately affected and at the greatest risk of prolonged and protracted displacement.

A protracted situation is defined as one in which the process of achieving a durable solution has stalled, and/or IDPs become marginalised because their economic, social and cultural rights are either violated or insufficiently protected.⁸ People caught in such situations also face the risk of further cycles of disaster and displacement. The monitoring of people living in prolonged and protracted displacement and the attention they receive tends to diminish over time, constituting a major blind spot and protection concern.

A **durable solution** is achieved a) when IDPs have returned home, integrated locally in their places of refuge or settled elsewhere in the country in way that is lasting and sustainable, b) when they no longer have specific assistance and protection needs linked to their displacement, and c) when they can exercise their human rights without discrimination.⁹

Whichever settlement option they choose to pursue, IDPs usually face continuing problems and risks that require support beyond the acute phase of a disaster. Achieving a durable solution is a gradual and complex process that needs timely and coordinated efforts to address humanitarian, development and human rights concerns, including measures to prevent and prepare for further displacement.¹⁰

Further discussion of reporting terms can be found in the notes on methodology in annex A.

2

The global scale of displacement: patterns and trends

Key findings and messages

2013

- Almost 22 million people were displaced by disasters in at least 119 countries, almost three times as many as were newly displaced by conflict and violence.
- Thirty-seven of the 600-plus recorded events involved the displacement of more than 100,000 people. Typhoon Haiyan, which caused the largest displacement of the year, forced a million more people to flee their homes in the Philippines than in Africa, the Americas, Europe and Oceania combined.
- The frequency of mass displacements in countries most vulnerable to natural hazards highlights the need for increased national and international support for disaster prevention and preparedness measures. In the Philippines, three major disasters struck in the space of four months - typhoon Haiyan displaced 4.1 million people, typhoon Trami 1.7 million and an earthquake in the Central Visayas region 349,000. The latter was the world's largest displacement of the year triggered by an earthquake.
- As in previous years, most of the largest displacements took place in populous Asian countries. Typhoons, floods and earthquakes in China and the Philippines accounted for 12 of the 20 largest displacements.
- Rainy season floods in sub-Saharan Africa triggered six of the largest displacements relative to population size. Five took place in Niger, Chad, Sudan, South Sudan and Somalia - neighbouring, semi-arid countries of the Sahel region with populations who are also affected by drought and conflict. The sixth took place in Mozambique.
- High exposure to hazards in the most developed countries also led to some of the world's largest displacements. Typhoon Man-yi in the Chubu region of Japan displaced at least 260,000 people and floods in Alberta, Canada displaced 120,000.

2008 to 2013

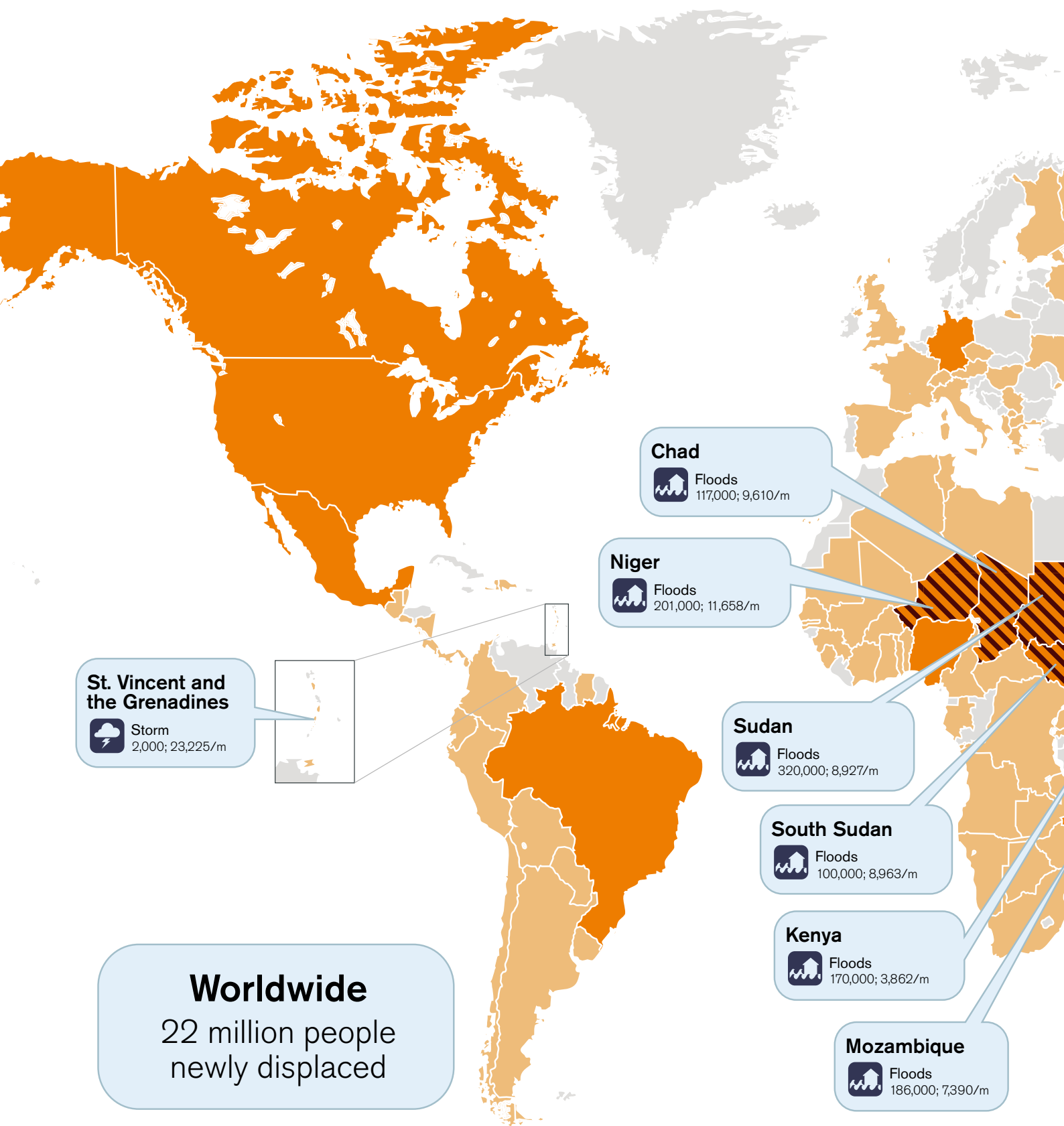
- Disasters displaced an average of 27 million people each year between 2008 and 2013. There are significant differences in the estimates from year to year, but the annual total has always exceeded 15 million.
- Major disasters are irregular and relatively infrequent, but they cause displacement on a huge scale when they do occur. Thirty-five disasters that each forced more than a million people to leave their homes accounted for 70 per cent of all displacement over the six-year period.
- Relatively small but far more frequent events tend to be under-reported, meaning that figures for small events are likely to be significant underestimates and their re-

peated and cumulative impacts are not widely appreciated. Events that each displaced fewer than 100,000 people made up 84 per cent of all those recorded, but accounted for just five per cent of the total number of people displaced. Increased investment in disaster risk reduction measures, such as better urban planning, the maintenance of flood defences and the introduction of building standards for housing and other infrastructure that can withstand smaller hazards, could prevent or mitigate much of their impact.

Trends since 1970

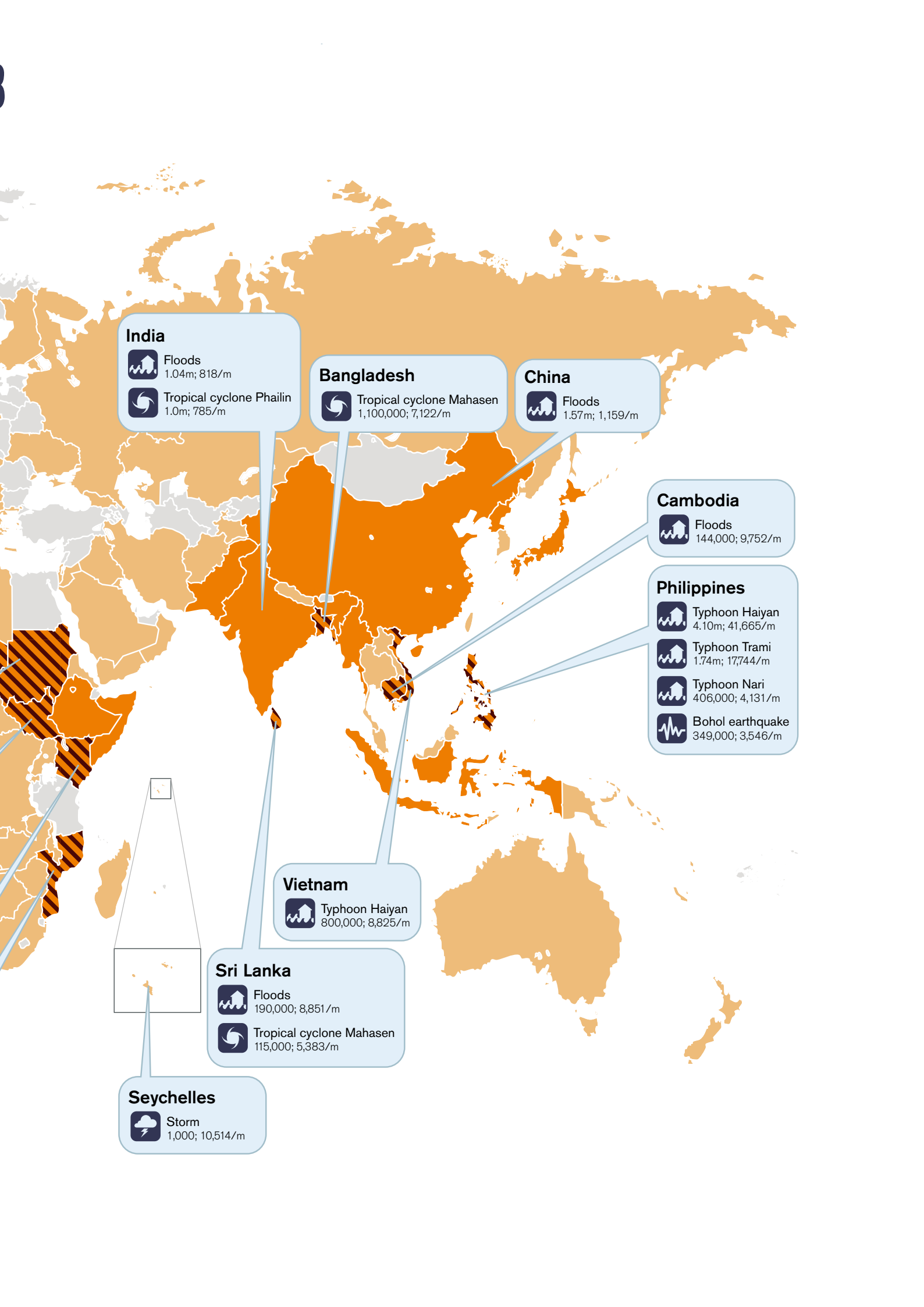
- Significantly more people are displaced by disasters now than in the 1970s. In absolute terms, the risk of displacement is estimated to have doubled in 40 years.
- A number of factors help to explain the rising trend:
 - More people are exposed to natural hazards and affected by disasters than 40 years ago, particularly in urban areas of more vulnerable countries. The global population has increased by 96 per cent since the 1970s, and urban populations have grown by 187 per cent. Urban populations in developing countries have risen by 326 per cent.
 - Improvements in disaster preparedness and response measures, including early warning systems and emergency evacuations, mean that more people now survive disasters – but many of the survivors are displaced.
 - The collection of data on disasters and displacement has improved, meaning that we know more about the impacts of recent disasters than we did about those that happened 40 years ago. That said, large gaps and the varying quality of available information mean that data collection needs to be better still.
- For five of the last six years, the global scale of new displacement has been below the trend since 1970. The exception was 2010, when more than 42 million people were displaced. If patterns revert to the longer-term trend, higher average levels of displacement are expected in the coming years.
- Demographic trends and vulnerability will continue to be the primary drivers of displacement risk in the coming decades, and changes in the frequency and intensity of extreme weather events are expected to add to it.
- The infrequent and random nature of the largest hazards makes annual displacement levels difficult to predict. This further highlights the need for greater investment in disaster risk reduction, climate change adaptation and preparedness measures that address people's underlying vulnerability to extreme weather and the risk of major earthquake and volcano disasters.

Disaster-induced displacement worldwide in 2013



Largest events in 15 countries with highest absolute and per capita displacement

- All countries with new displacement
- 50,000 people or more displaced
- At least 3,500 people displaced per million inhabitants



India



Floods
1.04m; 818/m



Tropical cyclone Phailin
1.0m; 785/m

Bangladesh



Tropical cyclone Mahasen
1,100,000; 7,122/m

China



Floods
1.57m; 1,159/m

Cambodia



Floods
144,000; 9,752/m

Philippines



Typhoon Haiyan
4.10m; 41,665/m



Typhoon Trami
1.74m; 17,744/m



Typhoon Nari
406,000; 4,131/m



Bohol earthquake
349,000; 3,546/m

Vietnam



Typhoon Haiyan
800,000; 8,825/m

Sri Lanka



Floods
190,000; 8,851/m



Tropical cyclone Mahasen
115,000; 5,383/m

Seychelles



Storm
1,000; 10,514/m

2.1 Displacement in 2013

2.1.1 The global estimate for 2013

Millions of people are forced to flee their homes every year as a result of disasters triggered by natural hazards. In 2013, rapid-onset disasters associated with climatic and weather hazards such as floods, storms and wildfires, and geophysical hazards such as earthquakes and volcanic eruptions, displaced 21.9 million people in at least 119 countries (see global map on the previous page). This is almost three times as many as newly displaced by conflict and violence in 2013, 8.2 million as reported in May 2014.¹

2.1.2 The largest mass displacements in 2013

Figures 2.1a and 2.1b list the 20 largest displacements of 2013 in absolute terms and per million inhabitants of the given countries. Figures relative to population size are intended to provide some indication of the pressure that the sheer scale of displacement may place on state capacity. More than 600 events were recorded during the year, of which 37 involved mass movements of 100,000 to four million-plus people.

Eighteen of the 20 largest events took place in Asia, with typhoons, floods and earthquakes in China and the Philippines accounting for 13 of them. Hundreds of thousands of people were displaced by flooding in Sudan and Niger, two of the countries ranked lowest in the world in terms of development, and by typhoon Man-yi in Japan, one of the richest.² Low and middle-income developing countries are disproportionately represented on the list. Eighteen of the 20 largest displacements were the result

of severe or extreme weather hazards, the exceptions being major earthquakes in Bohol in the Philippines and Gansu in China.

The Philippines suffered the two largest displacements of 2013. In September, widespread flooding in the metropolitan area of Manila in the wake of typhoon Trami displaced 1.7 million people, and in November typhoon Haiyan, known locally as Yolanda, displaced 4.1 million across central regions of the country. Many thousands of those affected fled to metropolitan Manila (see section 2.1.3).³ Six months earlier, the Bohol earthquake displaced nearly 350,000 people, including IDPs who had fled previous earthquakes. The three disasters combined stretched both national and international resources to the limit.

From the Philippines, Haiyan tracked north across Vietnam, where it triggered the mass evacuation of around 800,000 people, putting the displacement it caused there among the ten largest events in both absolute and per capita terms.

In south Asia, cyclone Mahasen forced the evacuation of around 1.1 million people in Bangladesh in May, and in October widespread monsoon season floods displaced over a million in several Indian states. In the same month, cyclone Phailin, the strongest to hit India in 14 years, brought widespread devastation to eastern coastal areas and forced the evacuation of another million people. Improved preparedness, including evacuations, was credited with limiting the death toll to fewer than 50 people.⁴

Figure 2.1 2013: largest displacement events



The disasters in Asia dominate the list of largest events in absolute terms, but 8 of the 20 largest events relative to population size were in sub-Saharan Africa. Five of the largest displacements triggered by widespread floods took place in Niger, Chad, Sudan, South Sudan and Somalia - neighbouring, semi-arid countries of the Sahel region with highly vulnerable populations who are also affected by drought and conflict. Other flood displacements took place in the southern African countries of Mozambique and Namibia, while a storm led to displacement in the small islands of the Seychelles archipelago. Four of the twenty relatively largest displacements occurred in small island developing states like the Seychelles - also linked to storms in the Caribbean countries of St. Vincent and the Grenadines and St. Lucia- and to a tsunami in the Solomon Islands.

A list of all the large displacements of 100,000 or more people in 2013 is provided in annex B, including location, date and source information.

2.1.3. Spotlight on the largest displacement of 2013: the typhoon Haiyan disaster in the Philippines

Haiyan was the largest typhoon ever recorded. It made landfall in the central island regions of the Philippines on 8 November, causing widespread devastation and the largest displacement of 2013 (see map 2.1). Around 4.1 million people were forced to flee their homes, more than a quarter of all those affected by the disaster (see figure 2.2). Beyond the sheer scale of the displacement

caused, data from government and other sources reveals a complex - if incomplete and somewhat disjointed - picture of IDPs' movements and their displacement-related needs in the six months after Haiyan struck.

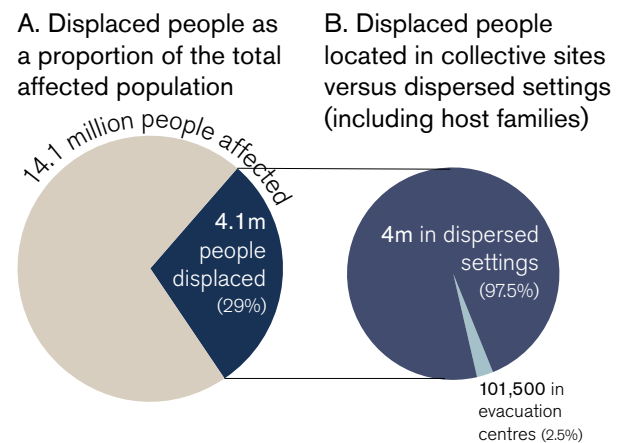
Following pre-emptive and immediate flight from danger in wide areas along the typhoon's path, the vast majority of IDPs sheltered in dispersed locations, including a significant number who took refuge with family or friends. Others sheltered in overcrowded public buildings designated as temporary evacuation centres, or in informal, spontaneous sites, tent cities and, later on, in transitional bunkhouses.⁵ Most IDPs remained within the areas affected by the typhoon, many of them within or near their local *barangays* or districts, but the movement of thousands of people between different regions and towards large urban centres was also observed (see map 2.2).

Staying as near to their homes as safely possible is often critical for IDPs for a number of reasons - to ensure their property is protected, to maintain links with sources of livelihoods and social networks, to access information and external assistance and to enable early steps towards reconstruction and recovery. In the aftermath of Haiyan, families split up in order to access livelihood opportunities elsewhere, with some members making temporary visits to their home while the rest remained in their place of refuge. In others, some family members stayed at sites near their homes, while the rest sheltered in other locations with better support, safety or access to basic services, including schools and medical care.⁶

C. Events ranked according to absolute and relative figures combined

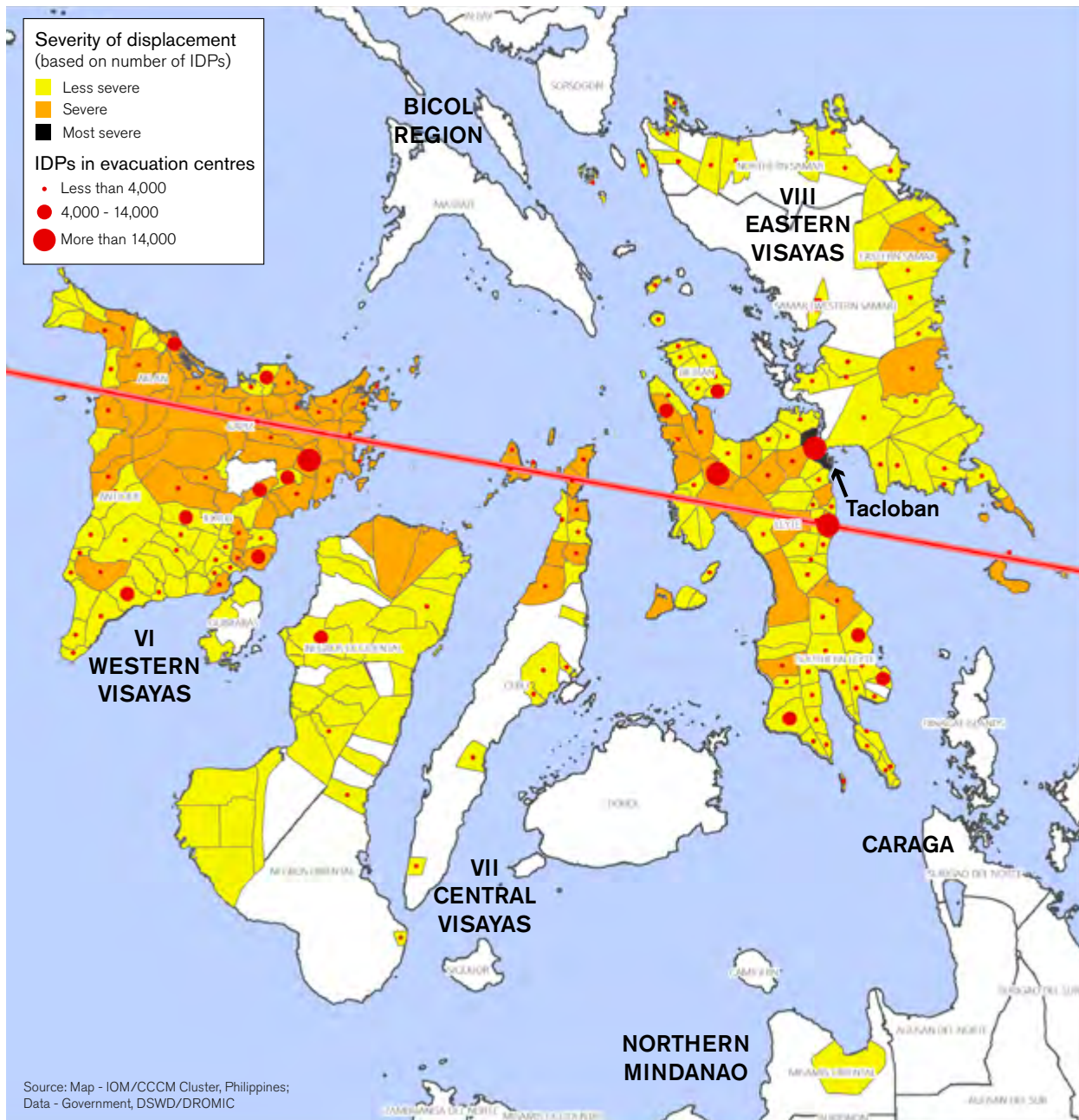
	Event	Country
1	Typhoon Haiyan	Philippines
2	Typhoon Trami	Philippines
3	Tropical cyclone Mahasen	Bangladesh
4	Typhoon Haiyan	Vietnam
5	Typhoon Nari	Philippines
6	Bohol earthquake	Philippines
7	Rainy season floods	Sudan
8	Rainy season floods	Niger
9	Floods	Sri Lanka
10	Floods	Mozambique
11	Rainy season floods	Kenya
12	Monsoon floods	Cambodia
13	Rainy season floods	Chad
14	Tropical cyclone Mahasen	Sri Lanka
15	Rainy season floods	South Sudan

Figure 2.2 Typhoon Haiyan disaster, Philippines

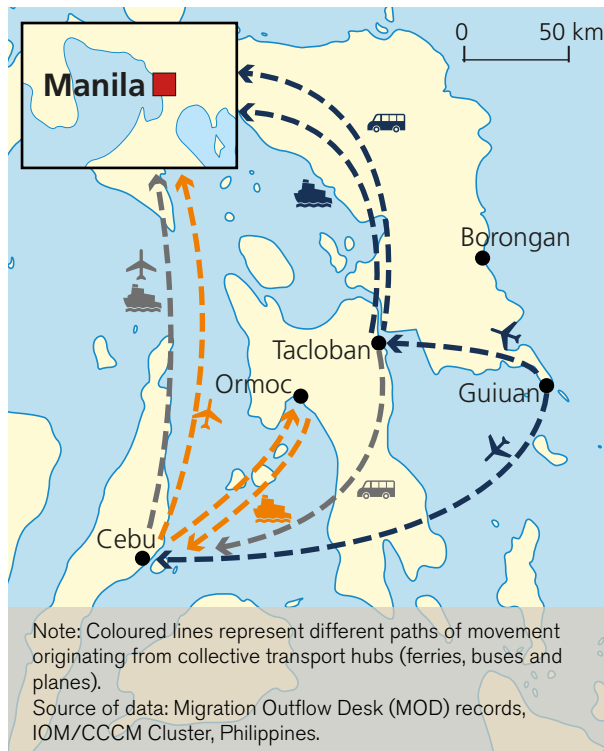


Source of data: Government, NDRRMC/DSWD, 2 January 2014

Map 2.1 Typhoon Haiyan disaster, Philippines: scale of displacement in affected areas and location of IDPs in evacuation centres 10 days after onset



Map 2.2 Typhoon Haiyan disaster, Philippines: IDP movements from key transport hubs in the affected areas to cities across different regions during the first month after onset (15 November - 6 December 2013)



Once conditions permit, IDPs have the right to return voluntarily, in safety and with dignity, to the homes they were displaced from and to reclaim their property and possessions.⁷ Return movements following Haiyan have not been comprehensively monitored, but information from a survey of IDPs in evacuation sites a couple of weeks after the typhoon, and from shelter assessments, shows that the majority of those displaced returned to their homes or as near as possible to them within hours, days or weeks of the storm passing. Some IDPs who fled further afield were also reported to have returned within weeks.⁸

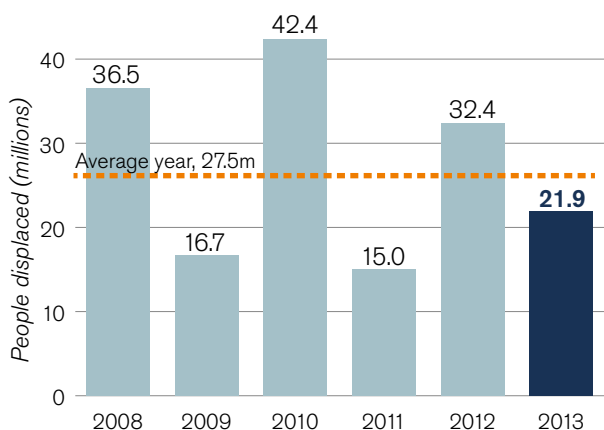
These patterns are similar to those seen in previous disasters in the Philippines and in rapid-onset weather-related disasters in other countries.⁹ That said, more than two million people were still without adequate or permanent shelter six months after Haiyan.¹⁰ Shelter assessments suggest that IDPs who returned early most often did so to live in damaged homes or in makeshift shelters or temporary sites in still devastated areas. Some who returned a few months after the typhoon passed were still living in tent cities.¹¹ Others delayed their return because they lacked the means to repair or rebuild their homes and because there was still no access to basic services in their home areas.

The government and humanitarian organisations distributed emergency and recovery shelter kits and implemented livelihood and cash-for-work programmes in affected areas, but six months into the response the need for materials and basic services was still high. Around the same time, the authorities began allowing humanitarian organisations to build transitional accommodation in areas designated as unsafe for permanent habitation, to relieve the situation of many thousands of families still living in makeshift shelters. Identifying and accessing land where safer and more permanent settlements can be rebuilt or developed from scratch remains a major obstacle to IDPs' sustainable recovery.

Those unable to return to their homes and begin the process of recovery from their displacement are of particular concern.¹² Six months on, around 200,000 IDPs were uncertain whether they would be allowed to return at all due to government plans to designate some original home areas as "no dwelling zones" unsafe for human habitation. They also faced uncertainty about what plans would be put in place and assistance provided for their permanent relocation.¹³ These IDPs included most of the 26,000-plus people still living in collective sites, and an unknown number still dependent on the hospitality of host families. Many were in the poorest and hardest-hit regions, where hosts were likely to have had only limited resources to meet their own basic needs. IDPs who do return to these zones face the risk of eviction from them, particularly those who were informally settled in them before the typhoon struck and who do not formally own the homes and land where they lived previously.

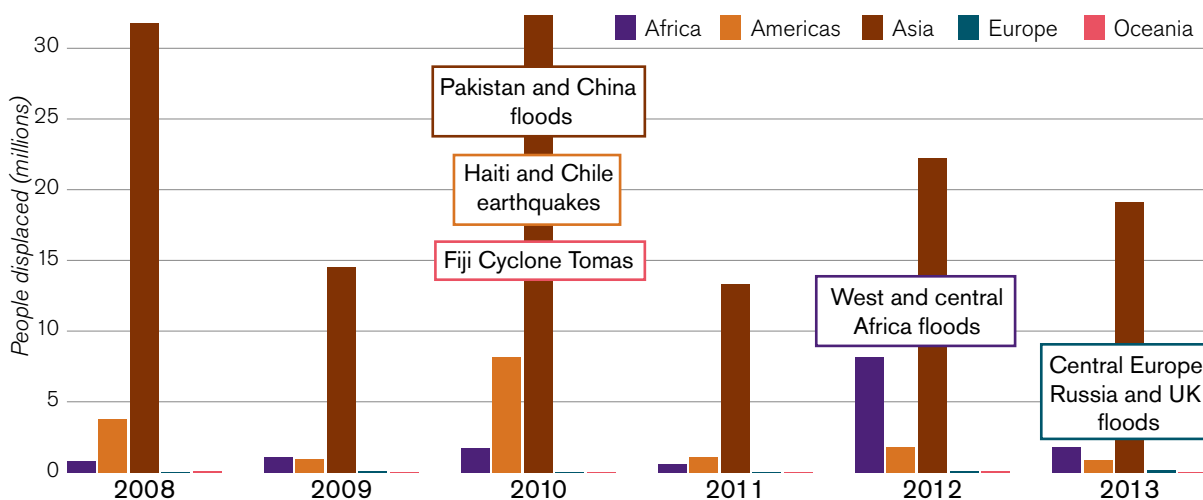
Thousands of displaced families still living in temporary shelters continue to be particularly vulnerable to seasonal typhoons and floods. The risk they face is further aggravated by a shortage of evacuation centres following the destruction of buildings used for emergency shelter.¹⁴ On 4 July 2014 the government announced the official start of the long phase of recovery and rehabilitation following Haiyan; eleven days later, the first typhoon of the year, named Rammasun, made landfall in the Bicol region. Approximately 4 million people were affected across seven regions, including more than 246,000 people displaced at the typhoon's height in the Haiyan-affected Eastern Visayas (Region VIII).¹⁵ Strengthening disaster prevention and preparedness, even as new disasters happen, remains high on the government's agenda.

Figure 2.3 The scale of global displacement by disasters, 2008 - 2013¹⁶



Source: IDMC estimates as of 22 August 2014

Figure 2.4 Annual displacement by region, 2008 - 2013

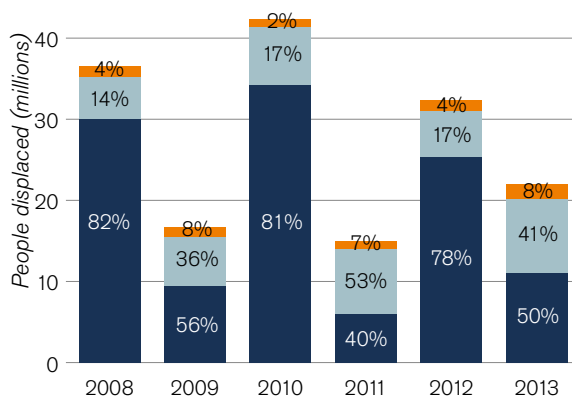


Note: The largest events in the peak year for each region are highlighted.

Source: IDMC estimates as of 22 August 2014

Figure 2.5 2008 - 2013: displacement by scale of events

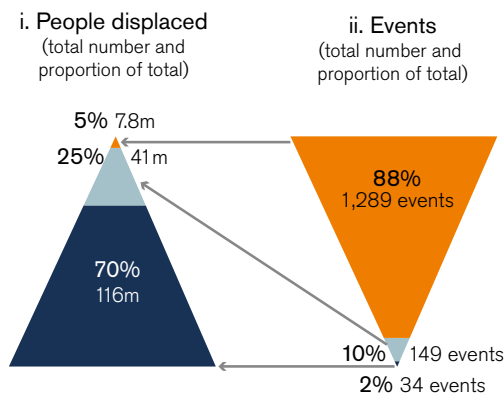
A. Proportion of total displaced per year



Small-medium events (<100,000 displaced) Large events (100,000 - 999,999 displaced) Mega events (>1 million displaced)

Source: IDMC estimates as of 22 August 2014

B. Number of events and displaced over six years



2.2 Displacement between 2008 and 2013

2.2.1 Year-to-year differences in the global totals

There are significant differences in the global estimates from year to year, but the annual total since 2008 has always equalled or exceeded 15 million (see figure 2.3). Between 2008 and 2013 an average of 27 million people were displaced. Regional figures showed similar variation, with peaks for Asia, the Americas and Oceania in 2010, for Africa in 2012 and for Europe in 2013 (see figure 2.4).

The year-to-year variance in global and regional totals is mostly due to the relatively small number of major disasters that cause mass displacement. Forty-three disasters, each of which forced at least 100,000 people to flee their homes, caused 91 per cent of overall displacement in 2013. Within those figures, six events, each of which displaced more than a million people, accounted for 41 per cent (see annex B and figure 2.5a).

Box 2.1 Displacement by small but frequent events: the tip of the iceberg?

Smaller displacement events occur far more frequently than larger ones, as seen in the data recorded for 2013 (see figure 2.6). Events that each displaced fewer than 100,000 people made up 88 per cent of all those recorded between 2008 and 2013 (figure 2.5bii). Smaller events tend to be under-reported¹⁷, however, meaning that figures for small events are likely to be significant underestimates and their repeated and cumulative impacts are poorly understood.

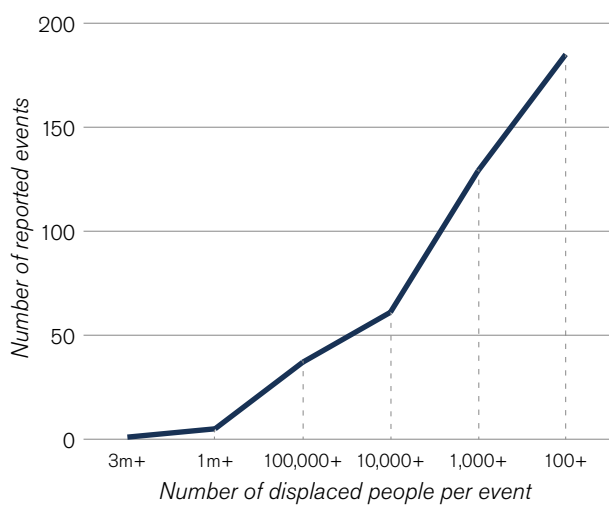
IDMC includes data without any lower threshold on the size of displacements recorded, but the methodology used and the data available creates a strong bias towards larger, more visible and more widely reported disasters. In many countries, information on smaller events is scattered at best and unavailable at worst. This reporting bias has been reduced for some countries in the 2013 data as a result of better

access to information on national disaster losses and additional time put in to research. At least 72 countries currently operate a national disaster loss database, of which 54 employ the DesInventar methodology, which addresses data collection on small as well as larger events. Such databases were a key source of information for seven countries in particular in 2013 - Colombia, Indonesia, Panama, Peru, Sri Lanka, South Korea and Timor-Leste. IDMC also invested time extracting and aggregating data from more than 40 US government reports on emergencies published during the year.¹⁸ As a result, these countries have much better data on small-scale events and more recorded displacements than other countries.

In the vast majority of countries, however, current estimates for smaller-scale displacements may be just the tip of the iceberg. The detailed data available for Indonesia includes more than 180 events, while the average number recorded per country is between five and six. This provides a sense of the size of the data gap, especially for the most vulnerable countries exposed to frequent hazards.

The number of people who flee their homes each time may be relatively small, but frequent and repeated displacement can erode assets and have a cumulative effect on poverty and vulnerability. The impacts of smaller-scale events are also amplified when they affect communities still recovering in the aftermath of large disasters. Much of the displacement caused by smaller-scale hazards would be preventable with increased investment in disaster risk reduction measures, such as better urban planning, the maintenance of flood defences and the introduction of building standards for housing and other infrastructure that can withstand such events.

Figure 2.6 Number of displacement events at different scales over a year (2013)



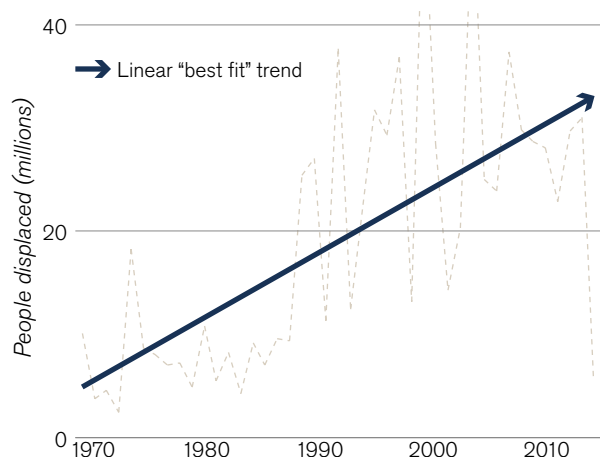
Source: IDMC estimates as of 22 August 2014

Between 2008 and 2013, displacements that each caused the displacement of more than 100,000 people caused 95 per cent of overall displacement. Thirty-four disasters that each displaced more than a million people accounted for 70 per cent, though just two per cent of all events recorded (see figure 2.5b).

2.3 The rising trend in displacement since 1970

In order to establish a historical view of trends in displacement induced by disasters, IDMC used disaster loss data related to the same types of natural hazards to compile modelled estimates for each year from 1970 to 2012. This methodology is explained in annex A.2. This broader dataset suggests that significantly more people are displaced by disasters now than in the 1970s. In absolute terms, the risk of displacement is estimated to have more than doubled in four decades (see figure 2.7).

Figure 2.7 Modelled global trend in disaster-induced displacement since 1970



Source: IDMC estimates as of 22 August 2014

A number of factors explain the rising trend. The global population has grown by 96 per cent since 1970, and the urban growth rate in developing countries has been more than three times that figure.¹⁹ This means that more people are exposed to hazards now than were 40 years ago, and that they are concentrated in more vulnerable countries (see table 2.1). Improvements in disaster preparedness and response, including early warning systems and timely evacuations, also mean that more people now survive disasters – but many of the survivors become displaced.²⁰

Table 2.1 Global population trends

	1970	2014	Percent increase (1970 - 2014)
World population	3.70 billion	7.24 billion	96%
Urban population	1.35 billion	3.88 billion	187%
Urban population in developing countries	0.68 billion	2.90 billion	326%

Source: UN Department of Economic and Social Affairs, 2014

It is important to note a certain amount of reporting bias because of significant improvements in the collection of data since the 1970s. It is still not systematic in many countries, but we know more about the impacts of disasters that occur now than we did about those that happened 40 years ago. The average number of tropical cyclones that made landfall each year was roughly constant from the 1970s to 2009, but the number of reported disasters brought on by cyclones increased nearly threefold over the same time period.²¹

For five of the last six years, the global scale of new displacement has been below the trend since 1970. The exception was 2012, when more than 42 million people were displaced. This is because most observed displacement is associated with large-scale hazards that occur infrequently. The 2008 to 2013 and 1970 to 2012 datasets cover too short a period to properly capture the distribution of events that recur in 20-year cycles, let alone more extreme ones that might only occur once a century or even once every 500 years. If recent patterns revert to the longer-term trend, there will be higher average levels of displacement in the future. Demographic trends and vulnerability to hazards will continue to be the primary drivers of displacement risk in the coming decades, and changes in the frequency and intensity of extreme weather events related to global climate change are expected to add to it.

The random nature of the largest hazards makes annual displacement levels difficult to predict. This further highlights the need for greater investment in disaster risk reduction, climate change adaptation and preparedness measures that address people's vulnerability to extreme weather and climate variability and the risk of major earthquake and volcano disasters.

Key findings and messages

- Developing countries account for the vast majority of displacement caused by disasters each year - more than 85 per cent in 2013, and 97 per cent between 2008 and 2013. Those with the lowest development levels and small island developing states are particularly vulnerable and they are disproportionately represented among countries with the highest displacement figures in absolute terms or relative to their population sizes.
- Repeated events leave little time for recovery between one disaster and wave of displacement and the next. Eighty-eight countries experienced a number of displacement events involving more than 10,000 people over the six-year period.
- Global displacement trends are driven primarily by population size and growth, but also by vulnerability. The increase in the number of people exposed to hazards has outstripped authorities' ability to reduce the vulnerability of their populations, particularly in urban areas. The availability of better information and the fact that more people survive disasters than in the past are also factors.
- To offset population growth, governments and their partners will need to step up efforts to reduce people's exposure and vulnerability by adopting and enforcing better land-use plans and building regulations, addressing income inequality and improving conditions for large populations living in informal settlements.
- The average number of people displaced by disasters has risen over the past four decades in all regions of the world, but the trend has been most marked in Asia. More vulnerable people are exposed to hazards there today than were 40 years ago, and it is the only region whose share of global displacement has exceeded its percentage of the world's population.
- Between 2008 and 2013, 80.9 per cent of displacement took place in Asia. The region accounted for the 14 largest displacements of 2013 and the five countries with the highest displacement levels: the Philippines, China, India, Bangladesh and Vietnam.
- Given that Africa's population is growing more quickly than other regions', people's exposure to hazards and displacement risk is expected to increase faster there in the coming decades. Its population is predicted to double by 2050.
- A small number of unexpectedly extreme hazards led to high levels of displacement in the Americas between 2008 and 2013. They included hurricane Sandy, which affected the US, Cuba and other countries in 2012, and the 2010 earthquakes in Haiti and Chile.

- Pacific island countries are disproportionately affected by disasters and the displacement they cause, because when a hazard strikes it can severely affect a very high proportion of their inhabitants. This pattern is also seen in small island developing states in other regions.
- Compared with other regions, Europe experienced lower levels of displacement relative to its population size between 2008 and 2013. That said, severe floods in central Europe, particularly Germany and the Czech Republic, and in Russia and the UK, made 2013 a peak year.

3.1 Displacement by region

Developing countries experience the vast majority of displacement caused by disasters each year, accounting for more than 85 per cent in 2013 and 97 per cent between 2008 and 2013. High-income countries are also affected, however. Both absolute numbers and trends strongly reflect the number of people exposed to natural hazards.

Most displacement since 1970 has taken place in Asia, where more people are exposed to natural hazards than in any other region. The 14 largest events of 2013 in absolute terms all occurred there (see figure 2.1 and annex B), and more than 19 million people were displaced during the year, or 87.1 per cent of the global total. Typhoon Haiyan alone forced a million more people to flee their homes in the Philippines than in Africa, the Americas, Europe and Oceania combined.

The same pattern emerges between 2008 and 2013, with Asia accounting for 80.9 per cent of the global total, despite having only 60 per cent which corresponds with its 79.9 per cent share of the world population (see figure 3.1a and 3.2). Displacement in the region relative to its population size is well above the global average (see figure 3.1a and b), and has increased faster over the past four decades than in any other (see figure 3.4). More people are exposed to hazards in Asia now compared to 1970, and more vulnerable people are exposed.

In Africa, 1.8 million people were displaced in 2013, accounting for 8.1 per cent of the global total. The region also accounted for 8.6 per cent of global total between 2008 and 2013 (see figures 3.1a and b). Extreme and widespread flooding in west and central Africa made 2012 a peak year, with 8.2 million people displaced.¹ The proportion of global displacement that happened in Africa is less

than its proportion of the world's population (15 per cent) because, compared to other regions, a smaller share of Africa's population is exposed to intense hazards that drive the global figures (see figure 3.2).

Exposure to hazards that trigger displacement is expected to increase faster in Africa than in other regions in the coming years and decades. Its population is growing more quickly and is predicted to double between 2015 and 2050, while Asia's is predicted to level off and begin to fall in the next few decades (see figure 3.3). This makes it all the more important for the region's governments

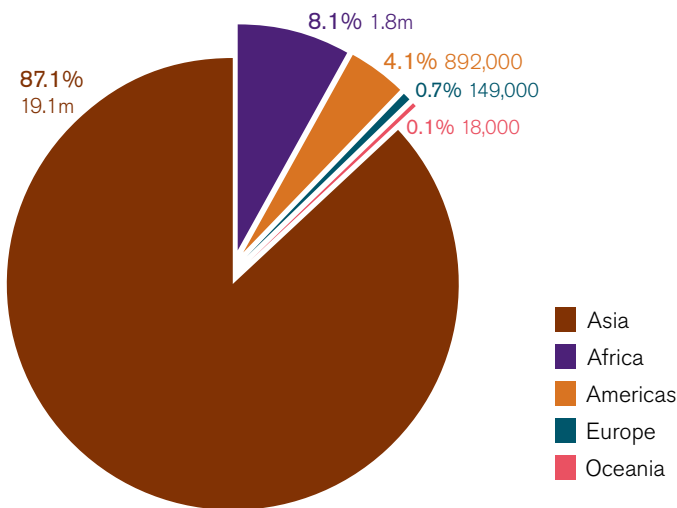
and their partners to reduce people's vulnerability and improve their resilience to natural hazards.²

The Americas had an unusually quiet hurricane season in 2013 and the region did not experience any major geophysical disasters either. Almost 900,000 people were displaced, accounting for only 4.1 per cent of global total (see figure 3.1a). In the six-year period, 16.6m people displaced in the region accounted for 10.1 per cent of the global total. These figures are the consequence of a small number of major disasters and the relatively low vulnerability of the population to hazards. These largest disasters included hurricane

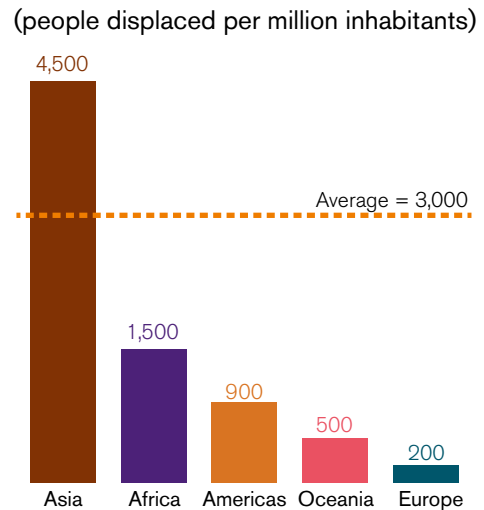
Figure 3.1 Global displacement by region, 2013 and 2008 - 2013

A. 2013

i. Absolute (total people displaced)

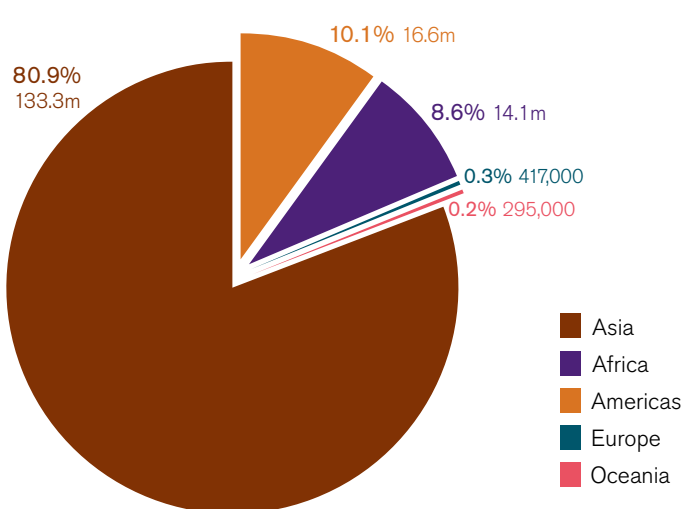


ii. Relative (people displaced per million inhabitants)

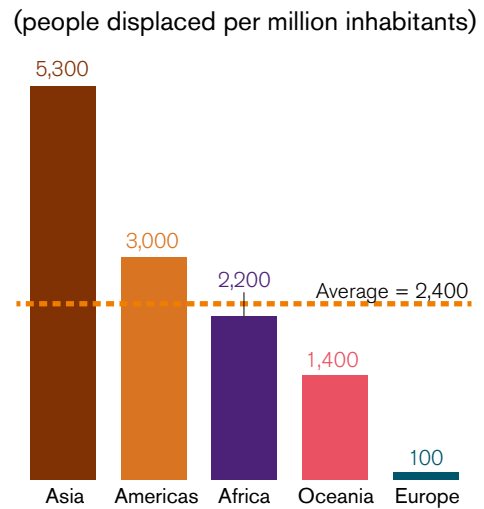


B. 2008 - 2013

i. Absolute (total people displaced)



ii. Relative (people displaced per million inhabitants)



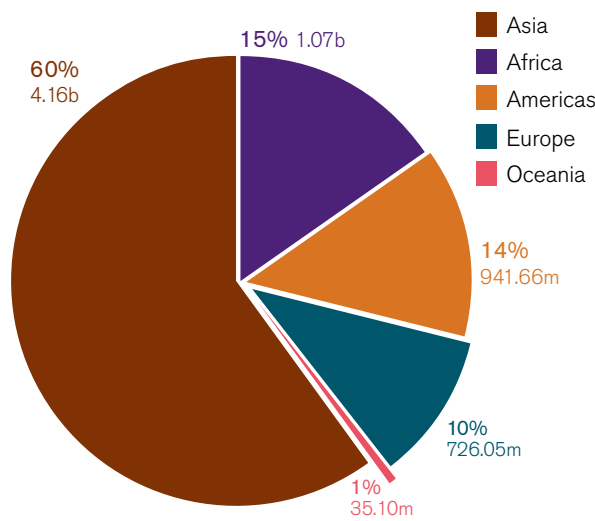
Note: Absolute figures below 1m are rounded to the nearest 1,000. Relative figures are rounded to the nearest 100. Source: IDMC estimates as of 22 August 2014

Sandy, which affected the US, Cuba and other countries in 2012, and the 2010 earthquakes in Haiti and Chile.

Europe accounted for 0.3 per cent of global displacement between 2008 and 2013, a disproportionately low figure given its 0.7 per cent share of the world population. In 2013, however, severe floods hit Europe, particularly Germany and the Czech Republic, as well as Russia and the UK. They displaced 149,000 people, making it a peak year and bringing the figure in to line with the region's share of the world population (see figures 3.1a and b).

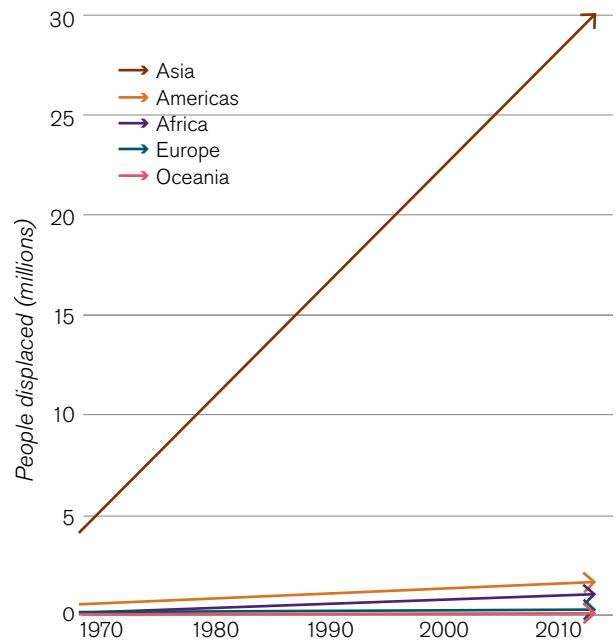
Oceania accounted for 0.1 per cent of global displacement in 2013, with 18,000 people forced to flee their homes, and 0.2 per cent between 2008 and 2013. As with Africa, the Americas and Europe, these absolute figures are lower than its one per cent share of the world's population (see figures 3.1a, 3.1b and 3.2). It was disproportionately affected, however, relative to its population size, a reflection of the fact that when a hazard strikes it can severely affect a very high percentage of inhabitants.

Figure 3.2 Total world population by region (2008 - 2013 average)



Note: Figures under 1m rounded to the nearest 1,000.
Source of data: UNFPA, State of World Population reports

Figure 3.4 Trends in displacement by region, 1970 - 2012

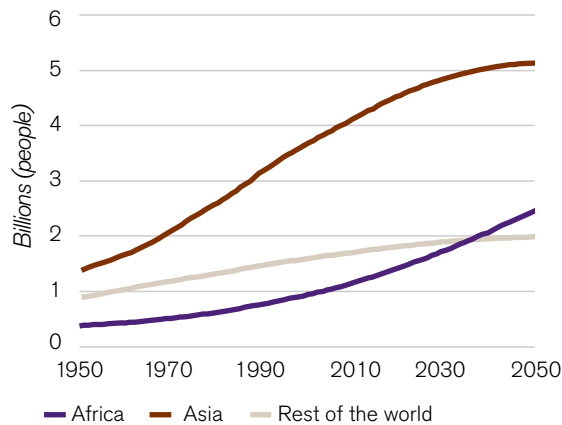


Source: IDMC, as of 22 August 2014

Figure 3.3 Total population by region, 1950 - 2050

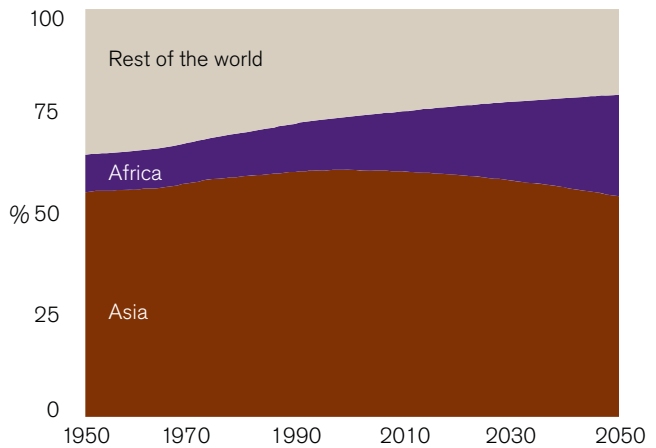
Africa's population will double from 2015 to 2050

A. Total population



Source: UNICEF, 2014

B. Share of total population



Displacement levels in absolute terms vary significantly from year to year in all World Bank-defined regions. Different regions also had different peak years between 2008 and 2013 (see figure 3.5a). East Asia and the Pacific, south Asia, Latin America and the Caribbean, and sub-Saharan Africa, in this order, had the highest levels of displacement in absolute terms and relative to population size. Consistently low figures in the Middle East and north Africa, and Europe and central Asia, reflect relatively small populations and low exposure to rapid-onset hazards. The 2011 peak in Europe and central Asia was due to earthquake disasters and a flood in Turkey, and floods in Russia and Kazakhstan. Floods in Algeria and Iraq contributed to the 2008 peak in the Middle East and north Africa. When displacement levels are considered relative to the population of each region, similar patterns emerge in terms of those worst affected (see figure 3.5b).

All regions experienced multiple displacements between 2008 and 2013, and all are prone to a number of different hazard types, of which floods, storms and earthquakes are the most common. The highest number of displacements were recorded in East Asia and the Pacific where 408 events provoked by these three most common hazards displaced 32.9m people (see figures 3.6a and b).

All regions were heavily affected by displacements caused by floods over the six-year period, with the Asian regions and sub-Saharan Africa producing the highest figures, and the highest number of events. The highest number of storm-related events and the highest number of people displaced were in East Asia and the Pacific with 31.5m displaced by 176 events. After this region, the highest number of storm events was seen in Latin America and the Caribbean with 2.6m people displaced by 141 events. The next highest number of people displaced was seen in South Asia with 6.6m people displaced but by only 31 large events. A high number of storm-related displacement events were also seen in high-income countries. Ninety-nine events displaced 3.5m people (see figures 3.6a and b).

Earthquakes also triggered significant displacements in all regions, with East Asia and the Pacific and Latin America and the Caribbean worst affected; 18.8m and 3.6m displaced, respectively. Europe and central Asia, the Middle East and north Africa and high-income countries experienced a similar number of events to Latin America and the Caribbean; 16, 14, 14 and 15 events per region, respectively. East Asia and the Pacific, and Latin America and the Caribbean, were the only regions to suffer displacement related to volcanic eruptions between 2008 and 2013, but such hazards occur more widely over a longer timeframe.

The most displacement related to extreme temperatures was seen in East Asia and the Pacific though they tended to cause relatively low levels of displacement – 936,000 displaced – and none was recorded in high-income countries and sub-Saharan Africa over the six-year period. Almost all that did occur was related to cold snaps and severe winter weather causing homes to collapse under the weight of snow and ice or forcing people to abandon areas at risk of becoming cut off.

It is interesting to note that high-income countries were the worst affected by displacement related to wildfires with 196,000 displaced, and wet landslides with 400,000 displaced. The Middle East and North Africa was only region not to suffer displacement caused by wildfires. Nor did it experience any related to storms. It also had the lowest figure for displacement caused by wet landslides, but the highest for dry landslides.

Hazards vary from year to year, and in many cases it is difficult to predict exactly where and when they will occur, but governments and their partners can still take action to prevent and prepare for the displacement they cause. Displacement only happens when the populations exposed to hazards are vulnerable to their impacts. To offset population growth and exposure as a driver of displacement, greater efforts to reduce people's vulnerability and strengthen community resilience should be made.

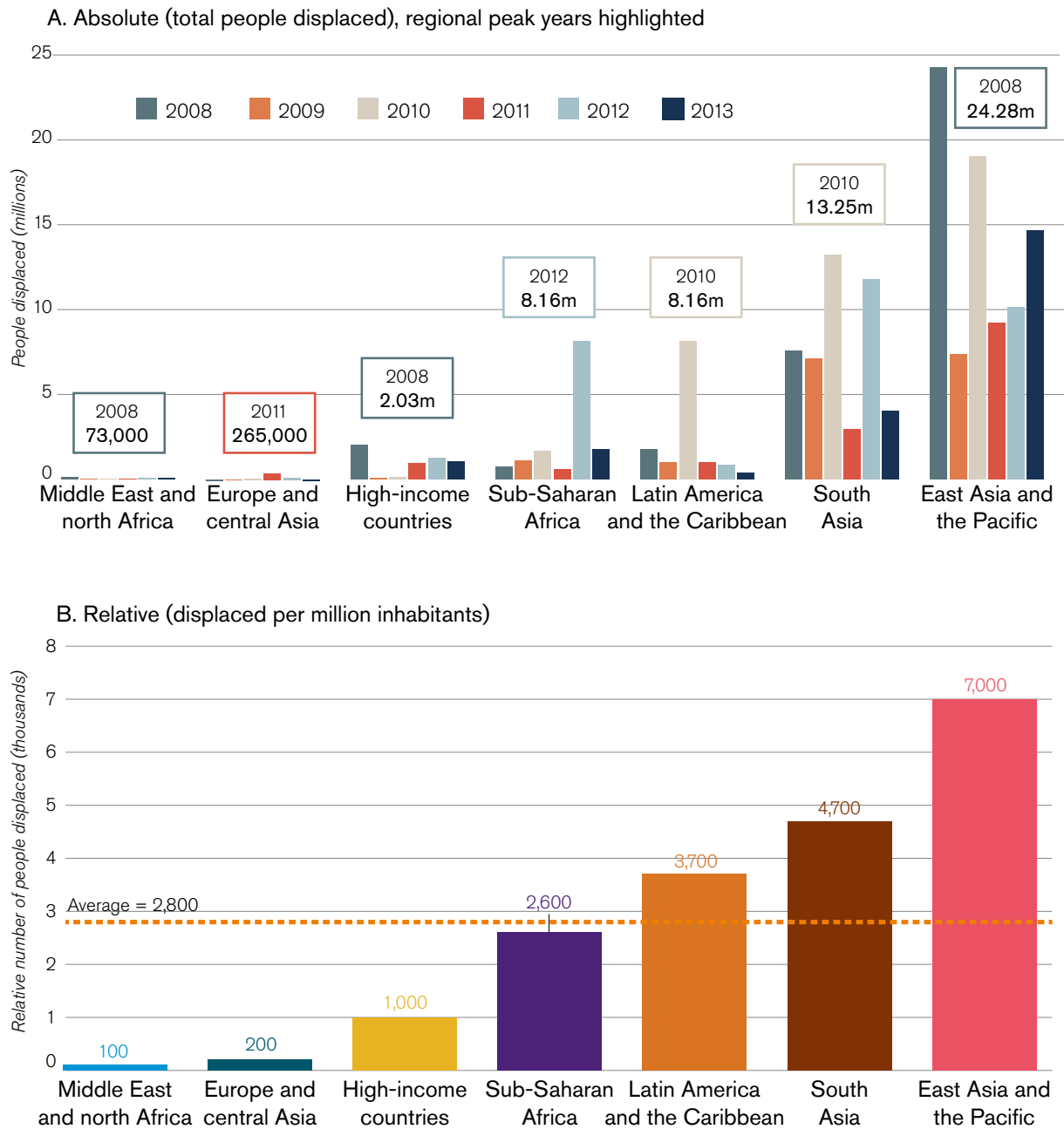
Displacement related to weather and geophysical hazards is discussed further in section 4.

3.2 Countries with the highest levels of displacement

National as well as regional patterns of displacement in 2013, and between 2008 and 2013, show that the worst affected countries experienced multiple displacements related to different types of hazards. The countries with the highest levels of displacement in 2013, and between 2008 and 2013, are shown in figures 3.7 and 3.8, in terms of both absolute figures and relative to population size.

High levels of displacement result when large numbers of people live in areas prone to hazards, in poorly designed homes and communities that are ill-prepared to cope with and recover from the shock of an extreme event. Even those who are aware of the risks have to weigh them against the access to natural resources, services, markets, transport and social networks they need to support their livelihoods. In developing and high-income countries alike, vulnerable families and communities are the most limited in terms of choosing where to settle. They are far more likely to live in poor quality housing in marginal locations highly exposed both to severe weather

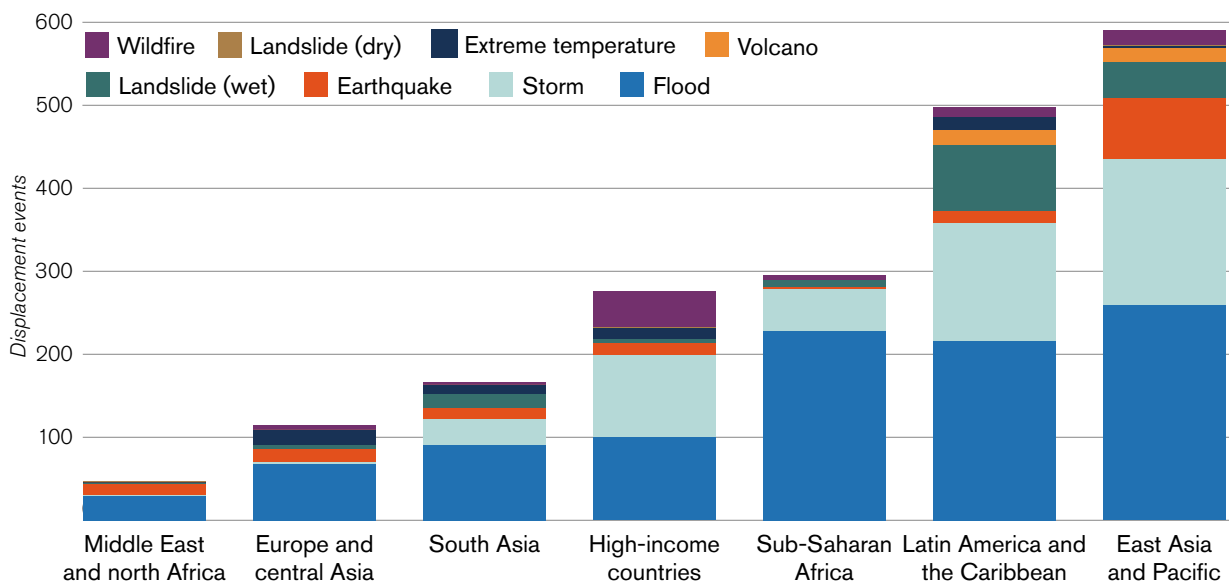
Figure 3.5 2008 - 2013: Annual displacement by World Bank-defined region (absolute and relative figures)



Note: Figures rounded to the nearest 100.
 Source: IDMC estimates as of 22 August 2014

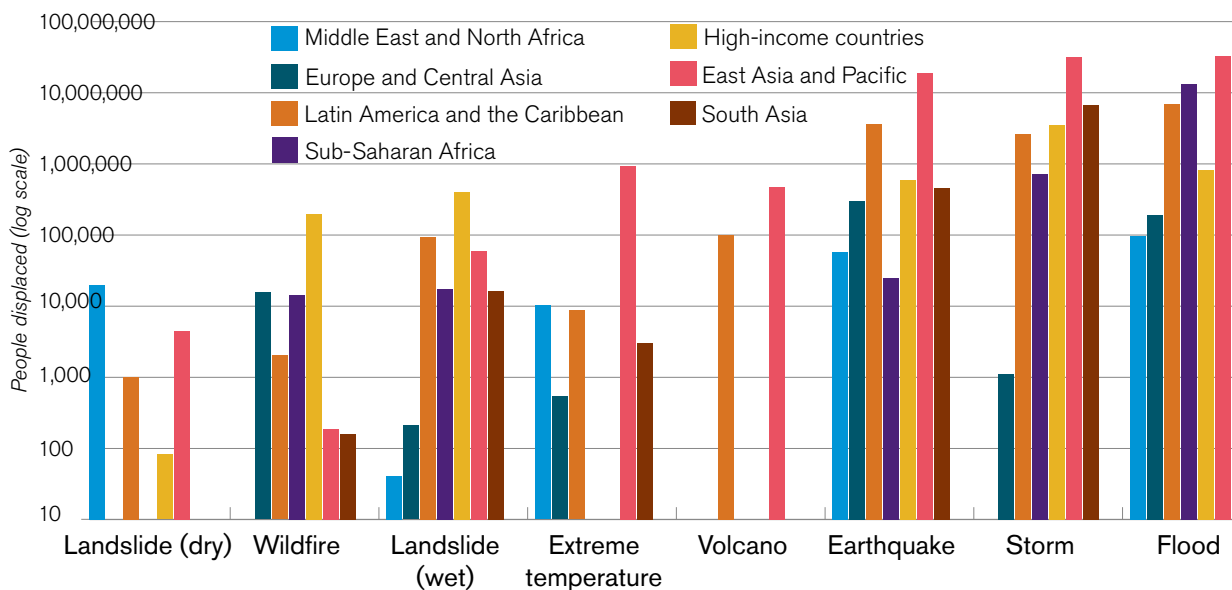
Figure 3.6 2008-2013: Regional displacement by hazard type

A. Number of events per hazard type



Note: All events with 100 or more persons displaced. Regions as defined by the World Bank.

B. Total displaced per hazard type



Note: Log scale. Regions as defined by the World Bank.
Source: IDMC estimates as of 22 August 2014

and less frequent but extreme events such as powerful earthquakes.

Low and middle-income developing countries make up the majority of the countries with the highest absolute and per capita levels of displacement in 2013 and over six years. Countries having the lowest levels of development together with those classified as LDCs are disproportionately represented. Between 2008 and 2013, absolute figures show over a third (9) are categorised as having the lowest levels of development or are classified as LDCs (see figure 3.7a), and this increases to half (12) when the figures are considered relative to population size (see figure 3.7b). In 2013, such countries account for 59 per cent (13 of 22) of these worst affected countries in terms of the absolute figures (see figure 3.8a) and half of them when ranked relative to population size.

The countries with the highest displacement levels are, unsurprisingly, those with some of the largest populations and highest densities.³ The most densely populated countries with more than 10 million inhabitants, and the most populous ones generally, feature strongly in the absolute figures and relative to their population size, both for 2013 and 2008 to 2013.

China, India, the Philippines, Pakistan, Bangladesh and **Nigeria** had the highest numbers of people displaced by rapid-onset disasters over the six-year period. All except the **Philippines** are among the world's 10 most populous countries. **China**, the world's most populous country, had some of the highest displacement levels each year both in absolute terms and relative to its population size, as did **Nigeria, Pakistan** and **Bangladesh**.

Considering displacement in 2013 alone, the **Philippines, China, India, Bangladesh** and **Vietnam** suffered the highest levels (see figure 3.7a). The **Philippines, Vietnam** and **Bangladesh** also had amongst the highest levels of displacement relative to population size (see figure 3.7b). Half of the countries with the highest absolute number of people displaced in 2013 also had the most displacement over the six-year period.

The **Philippines**, which is the 10th most densely populated country in the world, had the highest number of people displaced relative to its population size both in 2013 as well as over the six-year period. It also experienced the largest single event and the highest overall number of people displaced in 2013. Some people forced to flee their homes by the Bohol earthquake disaster in October 2013 were displaced again by typhoon Haiyan less than a month later.⁴ Similarly, IDPs still living in temporary shelters in the aftermath of Haiyan were displaced again by subsequent storms and floods.⁵

Haiti, one of the 10 most densely populated countries with more than 10 million inhabitants, had the second-highest level of displacement relative to its population size between 2008 to 2013. This is largely the result of the devastating earthquake that struck on 12 January 2010 and the disaster it provoked. At the time of the earthquake, 86 per cent of the population of Port-au-Prince were living in slum conditions, mostly in poorly built concrete buildings. Over four and a half years after the event, more than 100,000 IDPs are still living in temporary shelters in the capital's displacement camps. They include 57,500 people living in 53 camps vulnerable to natural hazards such as floods and landslides, and 30,000 living in 39 sites from which they are threatened with eviction.⁶

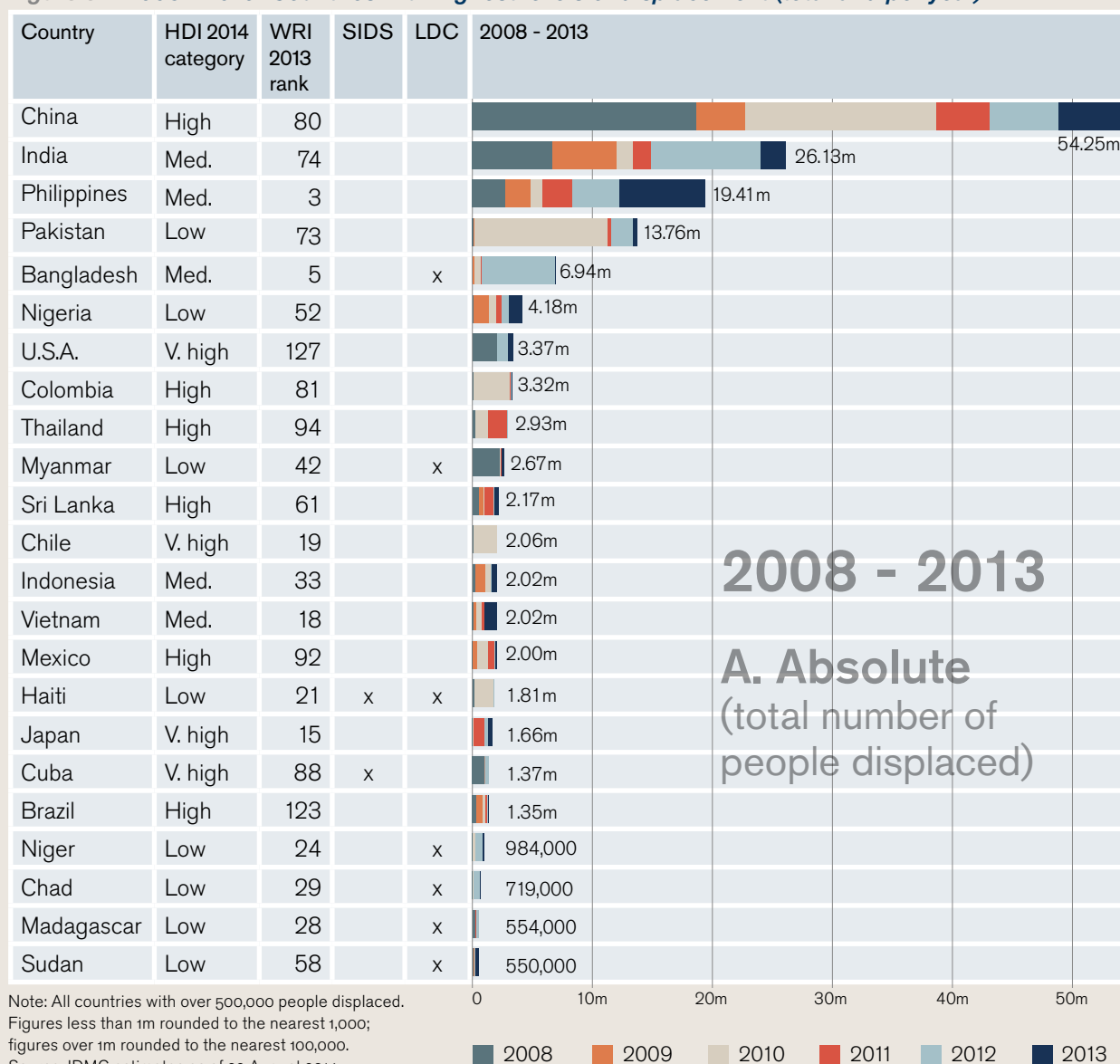
The degree to which these countries are exposed to natural hazards is clearly a key driver of displacement risk, but vulnerability is also a significant issue. This can be seen in their scores on the UN Development Programme (UNDP)'s human development index (HDI),⁷ and by the number of them that the UN classifies as least developed countries (LDCs).⁸ The Alliance Development Works' world risk index (WRI)⁹ is also used to highlight countries assessed to be most at risk from disasters. We have also noted whether they are small island developing states (SIDSs),¹⁰ which are low-lying countries particularly exposed to hazards such as storm surges and king tides that are made worse by rising sea levels.

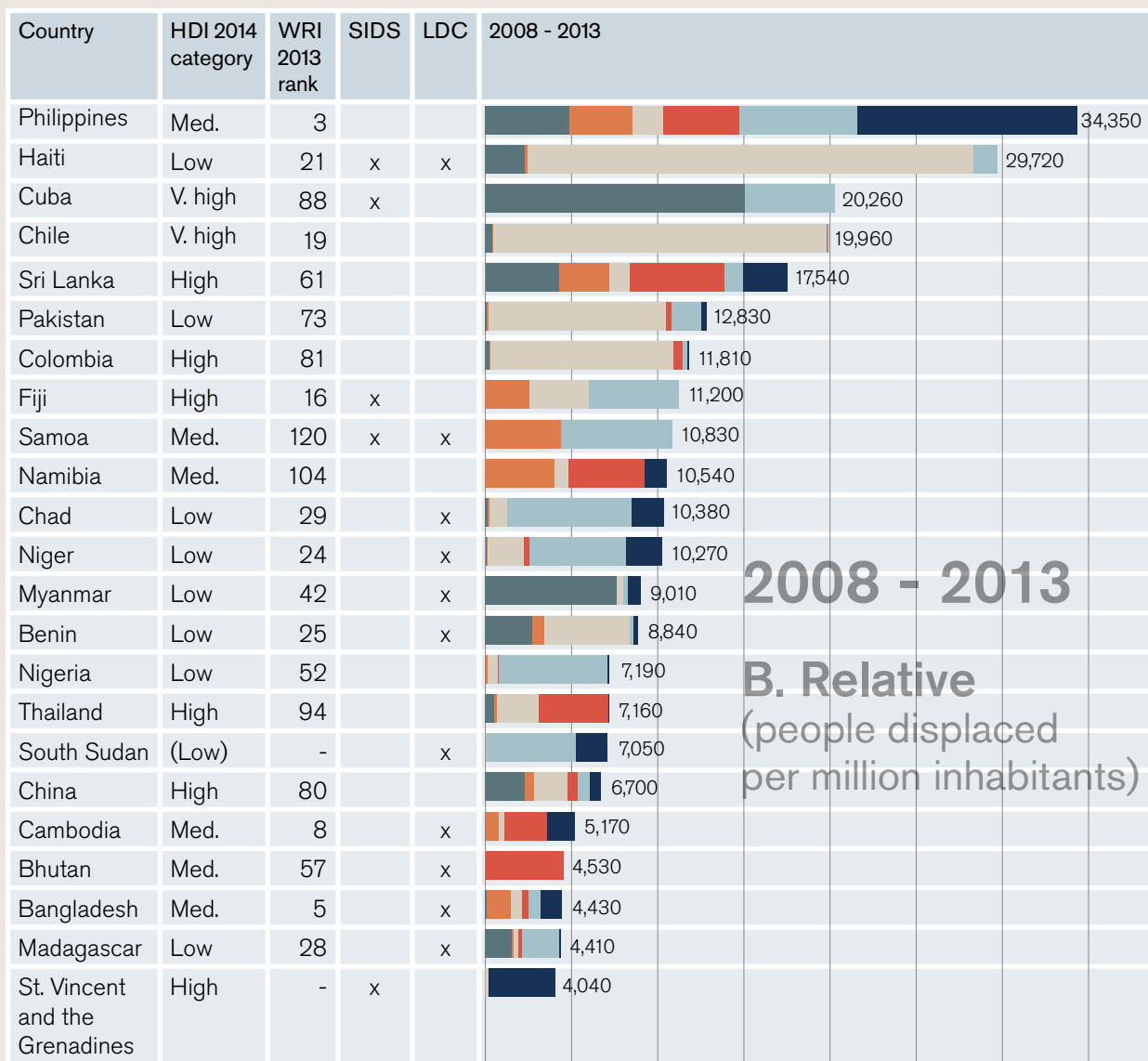
SIDSs across different regions of the world, including a significant number with high development levels, are also disproportionately represented in the rankings relative to population size, making up around a fifth of the worst affected countries in 2013 and over the six-year period (see figure 3.7b and 3.8b). As the UN resident coordinator in the Pacific puts it: "Even small disasters can overwhelm small island economies."¹¹ SIDSs are all but absent, however, in the absolute rankings.

Countries categorised as having very high levels of development based on the HDI 2014 are also impacted by high levels of displacement. This is observed in terms of absolute figures in **Japan**, the world's 10th most populous country, and the **US**, the world's 3rd most populous country, in both 2013 and over the six-year period. That said, relative to the size of their populations, the figures are relatively low compared with countries with similar numbers of people displaced.

Most of the countries with the highest levels of displacement are ranked in the top half of the WRI. That said, the fact that Bangladesh, Cuba, China, Fiji and Thailand improved their HDI score between 2012 and 2013 raises the hope that increased national capacity might translate into a reduction of displacement risk as part of development efforts, even in highly vulnerable countries.

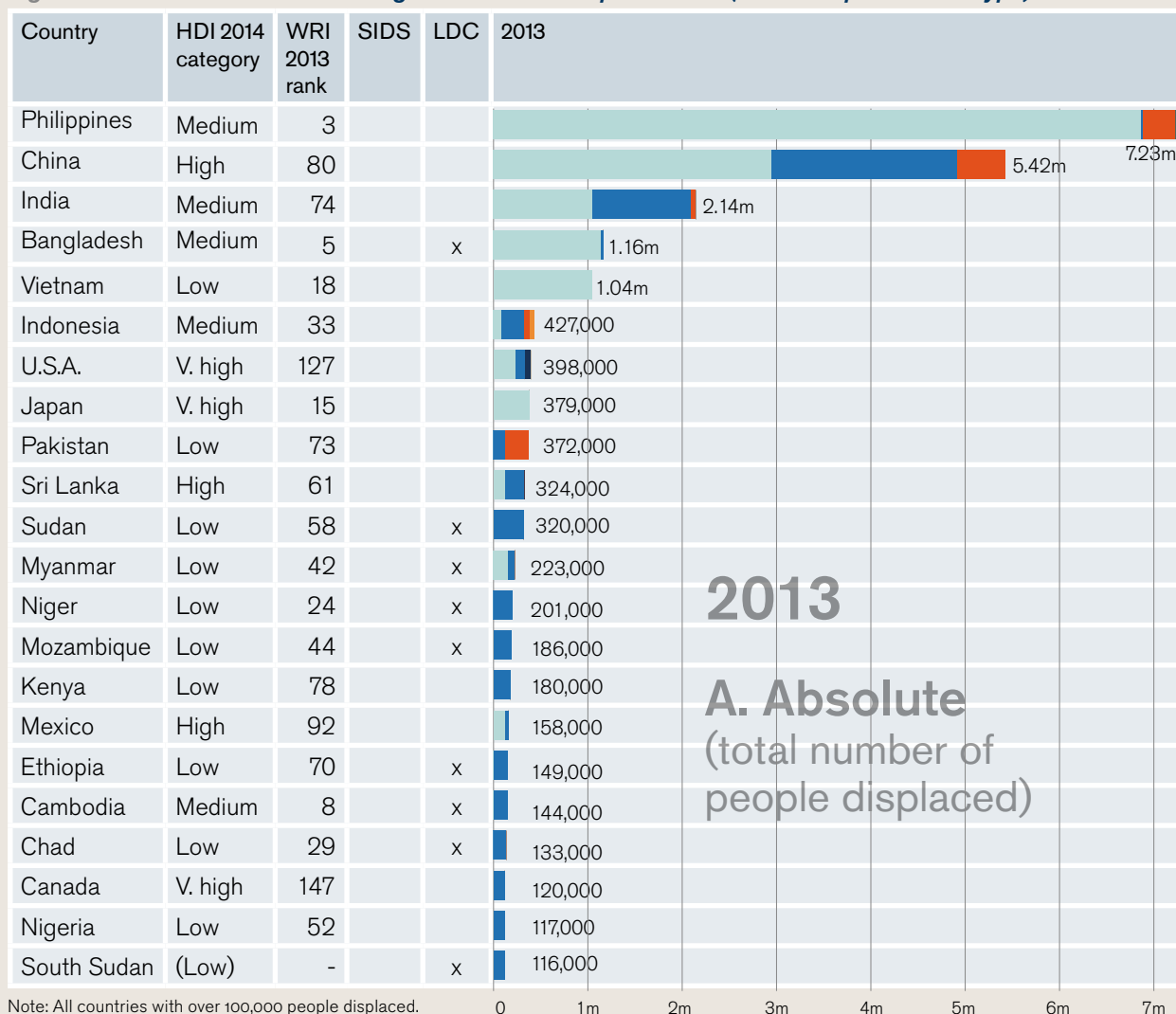
Figure 3.7 2008 - 2013: Countries with highest levels of displacement (total and per year)





Note: Countries with over 4,000 people displaced per million. Figures rounded to the first decimal.

Figure 3.8 2013: Countries with highest levels of displacement (total and per hazard type)

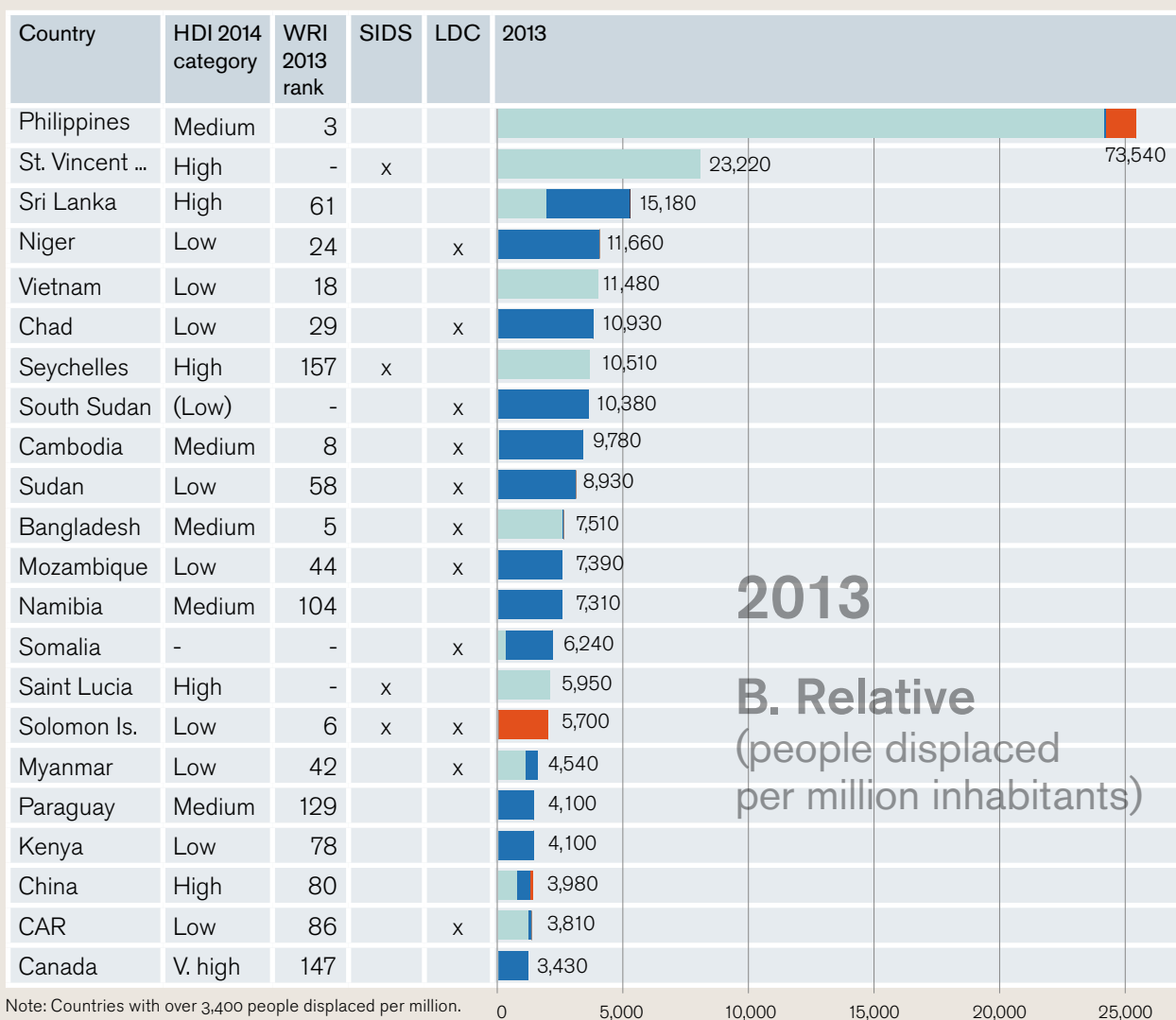


2013
A. Absolute
(total number of
people displaced)

Note: All countries with over 100,000 people displaced. Figures less than 1m rounded to the nearest 1,000; figures over 1m rounded to the nearest 100,000. Excludes low figures for extreme temperature and landslide (dry).

Source: IDMC estimates as of 22 August 2014

Storm Flood Earthquake
Wildfire Volcano Landslide (wet)



4

Displacement related to weather and geophysical hazards

Key findings and messages

- Weather-related hazards, particularly floods and storms, trigger most of the displacement induced by rapid-onset disasters almost every year. In 2013, such events triggered the displacement of 20.7 million people, or 94 per cent of the global total.
- Weather-related hazards are linked not only to normal variability in weather patterns, but also to long-term changes in the global climate that are expected to cause more frequent extreme weather events in the future. That said, changes in climate and weather patterns over the next two or three decades will be relatively small compared with the normal year-to-year variability in extreme events. Near and medium-term trends in displacement associated with disasters will be driven by factors that increase the number of people who are exposed and vulnerable to hazards, more than by the hazards themselves.
- The quantification of displacement related to drought remains a global gap, which IDMC is attempting to address. We have piloted a new methodology and tool to estimate the historical displacement of pastoralists in the Horn of Africa, which could be applied to other regions and livelihoods affected by drought. Decision-makers could also use the tool to evaluate the potential effectiveness of investments under different climate and demographic scenarios.
- Unless action is taken to reduce disaster risk and to help communities adapt to changing weather patterns, we are likely to see much more displacement in the coming years and decades. Preventing and preparing for such population movements, and ensuring that lasting solutions are achieved for those who do become displaced, makes development sustainable.
- For increasing numbers of people living in areas prone to natural hazards, early warning systems and well-planned evacuations will become ever more important. Plans and measures to protect evacuees, especially the most vulnerable, should cover all phases of their displacement, until they have reintegrated safely and voluntarily in their home areas or settled in alternative locations.
- Policymakers should take care to ensure that national disaster risk reduction and climate change adaptation plans and measures incorporate the risk and impact of displacement. Many of those we analysed do not. Authorities should also ensure that their plans do not have the potential to cause displacement. They should avoid measures that arbitrarily displace people or re-

quire their permanent relocation without full respect for their human rights.

4.1 Displacement related to weather hazards

Between 2008 and 2013, 85 per cent of all displacement associated with rapid-onset disasters was triggered by weather-related hazards. Except for 2008, the annual percentage was even higher, at more than 90 per cent (see figure 4.1a). The same general pattern is seen over the last four decades (see figure 4.1b).

Weather-related hazards displaced an average of 27 million people each year, with a low of 13.8 million in 2008 and a peak of 38.3 million in 2010. They accounted for 94 per cent of displacement in 2013, forcing 20.6 million people to flee their homes during the year (see figures 4.1a).

Displacement triggered by weather-related hazards is linked not only to normal variability in weather patterns, but also to long-term changes in the global climate. According to the Inter-governmental Panel on Climate Change (IPCC), the latest scientific evidence shows that anthropogenic climate change has already altered the magnitude and frequency of extreme weather events in some regions, and that such extremes have become more unpredictable.¹ This phenomenon is expected to contribute to increased levels of displacement risk in the future, though with significant variation in the number of people displaced from year to year and from region to region.²

That said, changes in climate and weather patterns over the next two or three decades will be relatively small compared with the normal year-to-year variability in extreme events. Near and medium-term trends in displacement associated with disasters will be driven largely by a wide range of factors that expose more vulnerable people to their impacts, many of them linked to levels of socio-economic development and the fact that an increasing number of human settlements are established in hazard-prone areas.

Hydrological hazards - floods and wet landslides, and meteorological hazards - different types of storms, triggered almost all weather-related displacement between 2008 and 2013. Floods caused 67 per cent and storms 32 per cent over the six-year period, but the proportions varied from year to year. In 2013 they were reversed, with floods causing 31 per cent and storms 69 per cent (see figure 4.4). Climatological hazards, mostly extreme winter conditions and wildfires, caused only one per cent over the six-year period.

Seasonal floods are vital to agricultural production and livelihoods in many parts of the world, but those that cause distress, loss of assets and unexpected or prolonged displacement are a highly significant source of risk to millions of people every year. They take various forms, including the widespread flooding of densely populated river basins following heavy rains, spring floods caused

by the thawing of snow and ice and flash floods in mountainous areas following dry periods, when the land is less able to absorb heavy rainfall. Storm surges also cause coastal flooding in low-lying areas. The built environment and poor drainage systems make floods caused by rainfall significantly worse than they might otherwise be in urban areas. Dams also play an important role in some major displacements, either when they are breached or when water is released without warning.

Disasters triggered by storms forced 14.2 million people to flee their homes in 2013, a peak year for such displacement (see figure 4.4). At least 31 events each led to the displacement of 10,000 people or more. Four of them displaced more than a million people each, and 17 displaced between 100,000 and a million each (see annex B). By comparison, there were only 14 displacements of more than 10,000 people in 2012, eight of them large

Figure 4.1 A comparison of displacement related to weather versus geophysical hazards

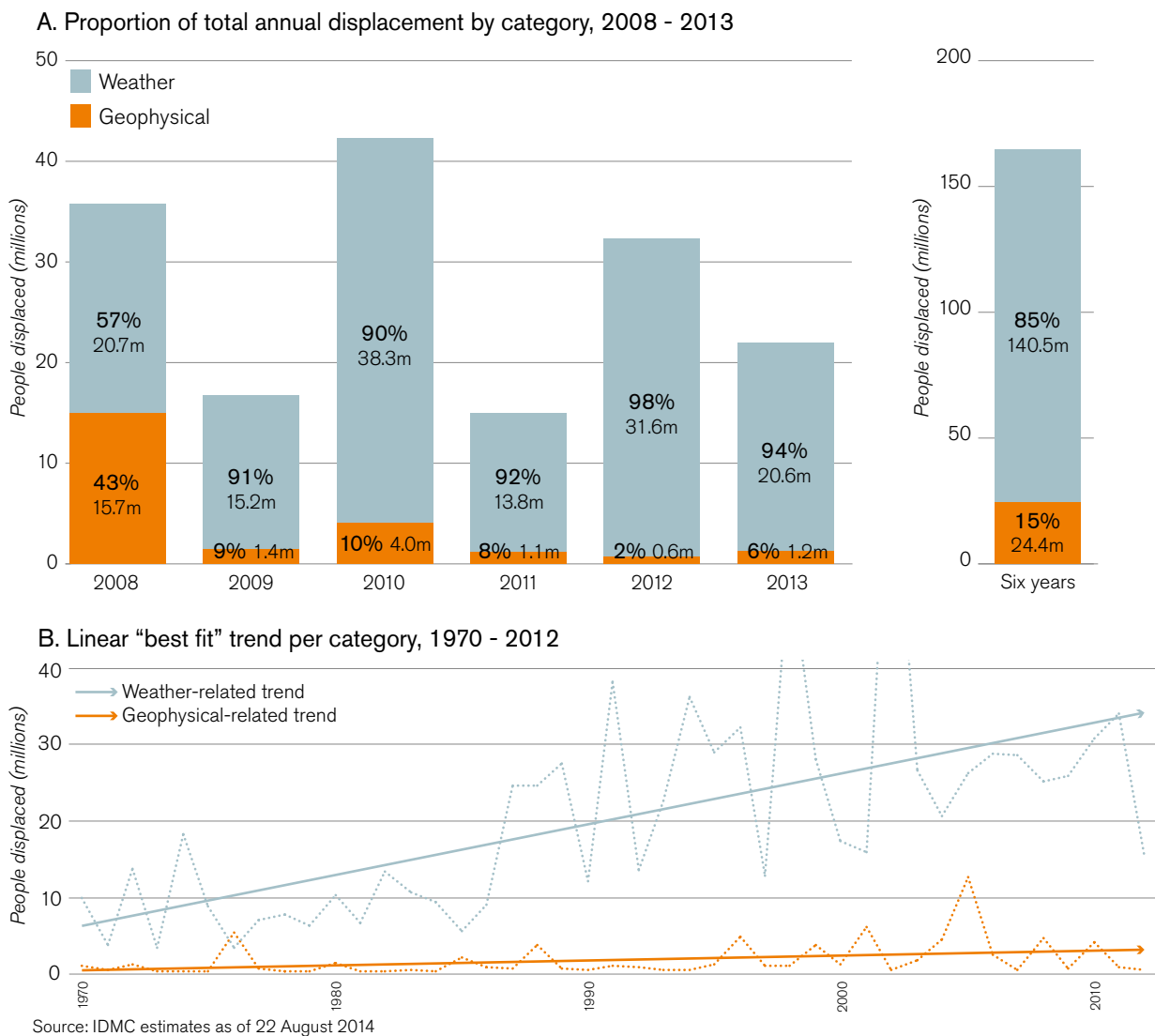
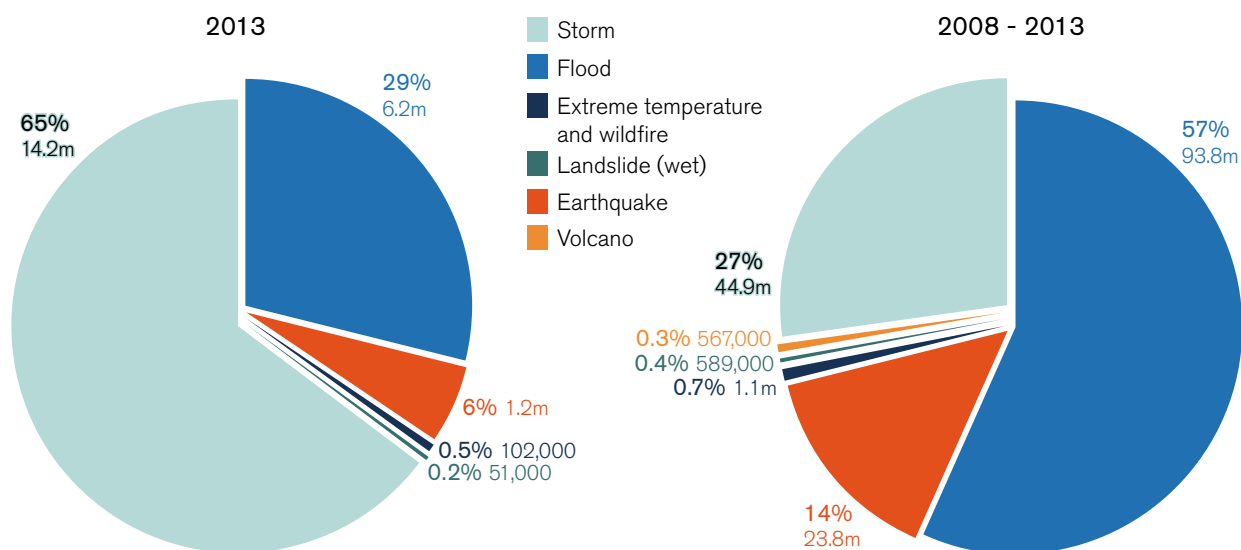
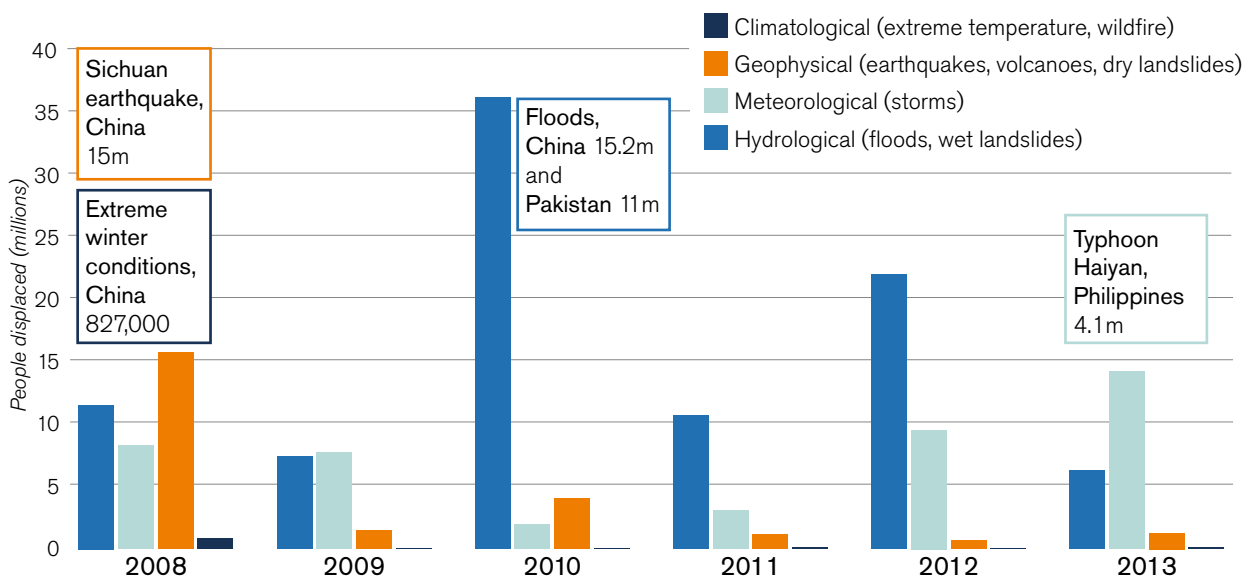


Figure 4.2 Displacement by type of hazard



Source: IDMC estimates as of 22 August 2014, rounded figures.

Figure 4.3 Annual displacement and largest events by hazard category, 2008 - 2013



Note: Largest events per category of hazard during 2008 - 2013 are highlighted.
Source: IDMC estimates as of 22 August 2014

events that displaced more than 100,000.³ IDMC's modelled estimates back to the 1970s suggest that levels of displacement caused by storms similar to 2013 had not been seen for 15 years.

Most of the displacement in 2013 was in Asia, where tropical cyclones, typhoons and other storms forced 13.8 million people to leave their homes (see figure 4.5). In the Philippines, typhoon Haiyan alone displaced 4.1 million people, while cyclones Mahasen in Bangladesh and Phailin in India each displaced more than a million. The Atlantic basin hurricane season, meantime, was unusually quiet. For first time since 1994, the region saw no major hurricanes in 2013.⁴

The need to be better prepared for an increasing risk of displacement should ring alarm bells for those developing climate change adaptation plans. IDMC's analysis shows that many countries have not incorporated displacement in existing plans.⁵ Policymakers must also ensure that greater attention is paid and investment made in preventing and preparing for displacement caused by disasters if development gains are to be sustainable. They should take care, however, to avoid measures that might arbitrarily displace or permanently relocate people without full respect for their human rights. Failure to do so will increase the risk of impoverishment and vulnerability, rather than addressing it sustainably. Such cases are not captured in the displacement data presented here, and monitoring and reporting on them should be strengthened.⁶

Figure 4.5 Annual displacement by storm-related disasters in Asia, 2008 - 2013

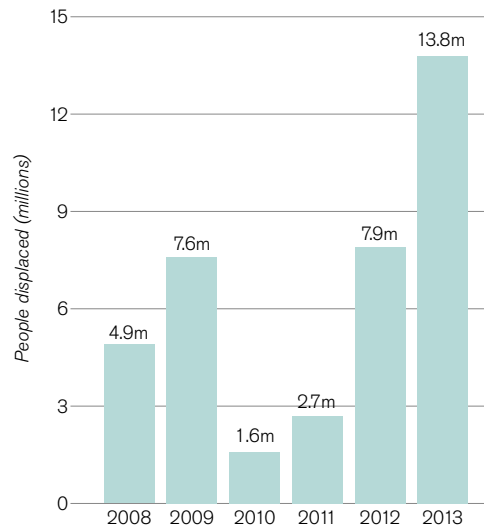
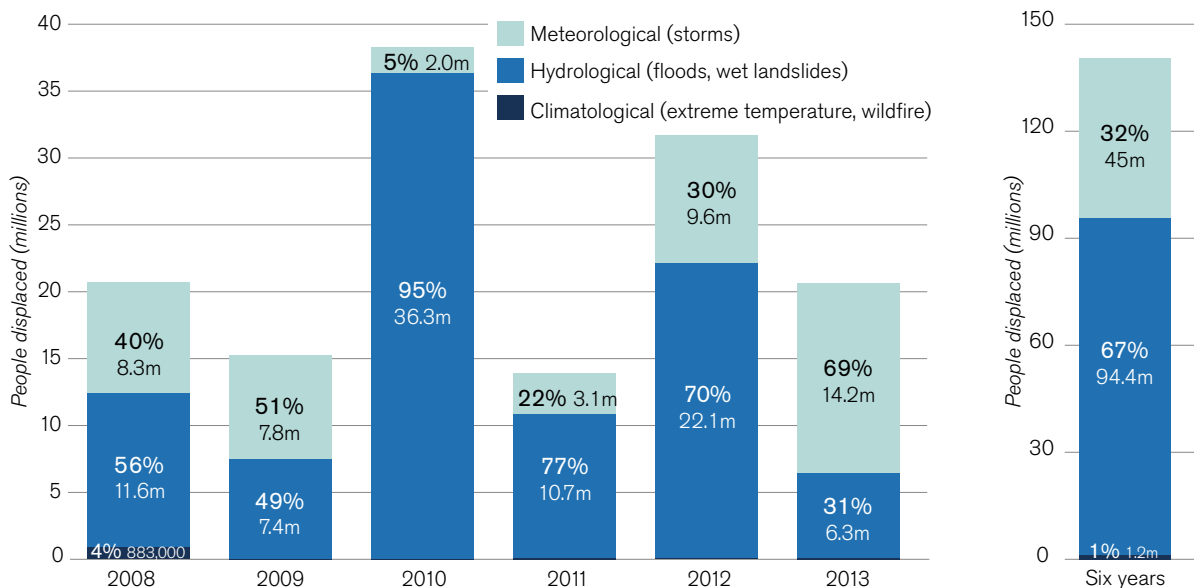


Figure 4.4 2008 - 2013: Displacement by weather hazards



Source: IDMC estimates as of 22 August 2014

4.2 Displacement related to geophysical hazards

Since 1970, displacement related to geophysical hazards has also risen (see figure 4.1b). This is in spite of the fact that they are far less common than weather-related hazards (see figure 3.6a). When large-scale geophysical hazards do occur, however, they can cause massive displacement and they strongly influence the shape of a trend. The highest-intensity hazards occur even less than once per century, which makes it difficult to analyse trends when using six or even 40 years of data.

Between 2008 and 2013, for example, earthquakes create significant spikes in the global figures, as seen with the Sichuan earthquake in China in 2008 and earthquakes in Chile and Haiti in 2010 (see figure 4.6a). They also cause the vast majority of displacement associated with geophysical hazards, 96 per cent on average between 2008 and 2013 (see figure 4.6b).

The nature of different hazards greatly influences the way displacement situations evolve, and the types of preparedness, mitigation, response and recovery measures that need to be put in place. Earthquakes differ from most floods and storms in that their moment of impact is highly unpredictable. There is little or no warning period in which people can flee pre-emptively, meaning that

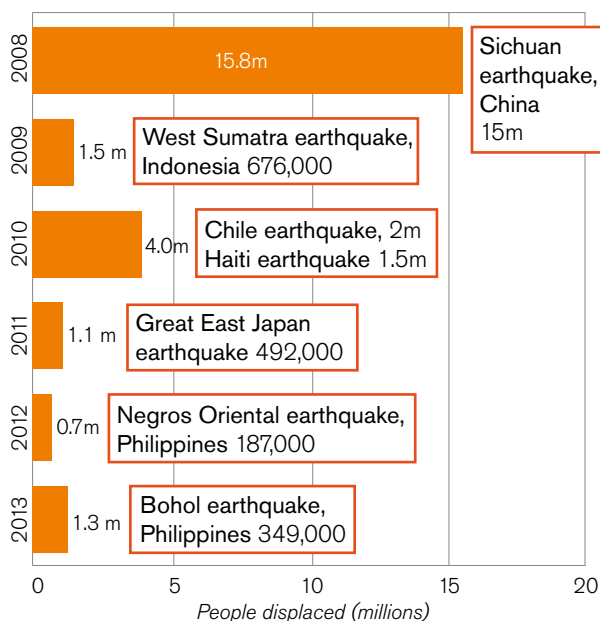
any displacement takes place after, or even during, their initial impacts.

Major destructive earthquakes create emergencies that tend to be complex and rapidly evolving. Flight is forced by the immediate and subsequent collapse of buildings and other infrastructure, but the ability to leave the affected area may be limited. Aftershocks and other secondary hazards such as fire, flooding, landslides and environmental contamination may complicate the situation further, basic services may collapse and those affected may suffer exposure to violence and other threats to their safety and security not directly related to the earthquake itself. In low-lying coastal areas, tsunamis may be a risk whether or not there is severe ground-shaking on land. Fast-moving tsunami waves can materialise in a matter of minutes, making effective early warning systems vital to enabling flight and saving lives.

Many of the same factors also hamper access to affected areas, with implications for the emergency response, the quality of information available and the speed with which it is collected and reported. Data on housing destroyed is often the most reliable, though conservative, indicator of the broad scale of displacement, but it clearly does not provide any sense of when people flee, where they take refuge or for how long. Such data also tends not to be available and verified for weeks or even months.

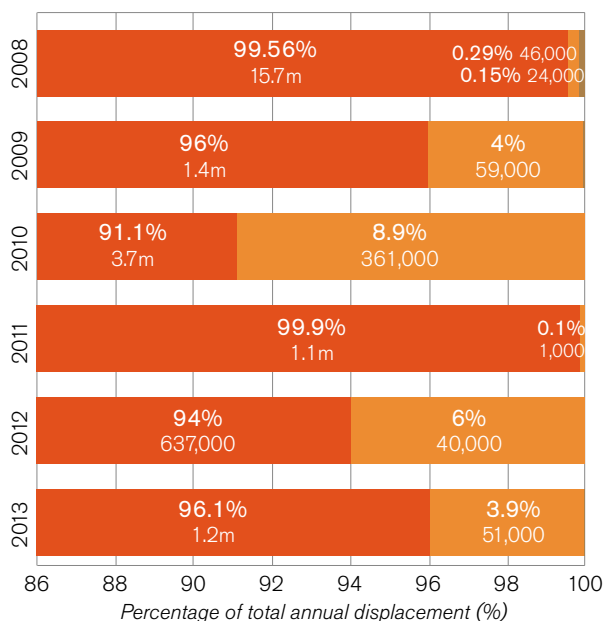
Figure 4.6 2008 - 2013: Displacement by geophysical hazards

A. Total displaced - all types



Note: Largest geophysical displacements of each year are highlighted.
Source: IDMC estimates as of 22 August 2014

B. Proportion of total displaced by type



■ Earthquake ■ Volcano ■ Landslide (dry)

Note: The Y-axis uses a scale from 86 - 100% in order to highlight all types of hazards.

4.3 Emergency evacuations

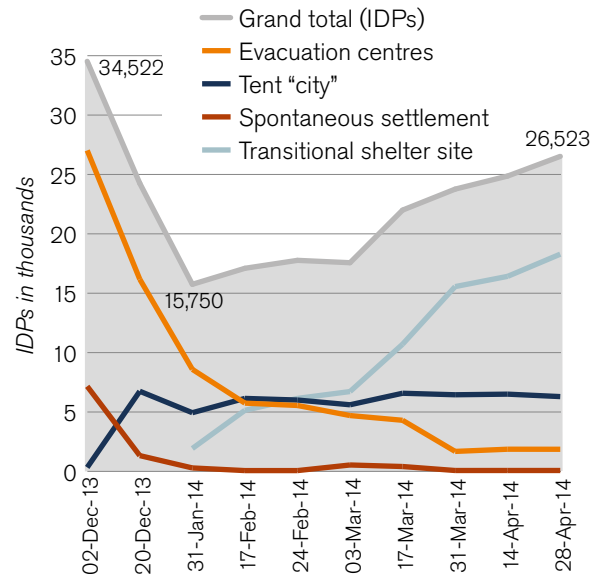
Timely, well-prepared and effectively managed evacuations⁷ are critical to the survival and protection of exposed and vulnerable people before, during and after the onset of a disaster. Evacuations may take different forms, depending on the type of threat and the capacity and preparedness of authorities to implement them. Local and national authorities responsible for their preparation and implementation may recommend that a population evacuate or they may issue a mandatory order to do so. Evacuations may happen spontaneously before an official order or advisory notice is issued, and “shadow” evacuations from areas outside designated zones may also take place (see figure 4.7).⁸

Well-developed plans help to ensure that the rights and vulnerabilities of evacuees and others affected by a disaster are not compromised by the risks they face, both during the evacuation process itself and in places of refuge. They should prepare for scenarios based on trends in the size, location and vulnerability of populations and settlements, rather than assuming that future disasters will be similar to those seen in the past,⁹ and they should take changing environmental factors and the expectation of less predictable weather patterns and extreme hazard events into account.

Data on evacuees reveals rapid and highly dynamic movements during the initial phases of a crisis, with the best information usually gathered from those sheltering in officially designated evacuation centres.¹⁰ Different types of hazards allow for different notice periods, which affect the timing and nature of evacuations. Some events, such as wildfires and hurricanes, allow for advance warning, pre-emptive evacuations and other early action to mobilise an emergency response. Others, such as earthquakes and flash floods, occur with little or no warning, leading to relatively high mortality rates and the evacuation of survivors from already devastated areas.

Evacuations tend to be planned and undertaken on the assumption that they will be short-term temporary measures, and that the evacuees will be able to return to their homes. When the impacts of a disaster are severe, however, they may be just the first phase in prolonged displacement. This may involve evacuees’ relocation from evacuation centres to transitional shelters, and if return is not possible, the provision of alternative options for permanent relocation. Evacuees’ movements following typhoon Haiyan in the Philippines serve as an example of such patterns. Data collected by the Camp Coordination and Camp Management (CCCM) cluster shows that as the number of people in evacuation centres fell, increasing numbers moved to medium-term or transitional shelters (see figure 4.7).

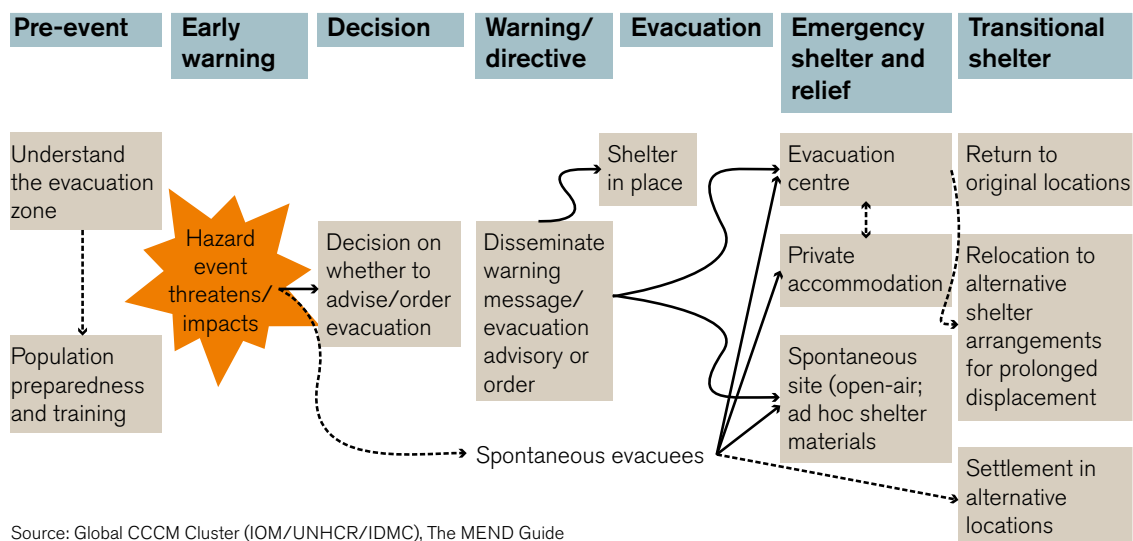
Figure 4.7 Typhoon Haiyan disaster, Philippines: IDPs staying in different types of collective shelter sites, December 2013 - April 2014



Source of data: Displacement Tracking Matrix/CCCM cluster, Philippines, 2 December 2013 - 28 April 2014

When a large rapid-onset disaster strikes, the sheer number of people forced to flee within very short periods of time creates significant risks and challenges, both for the evacuees themselves and for government authorities and others working to protect and assist them. Local communities in refuge areas are also affected, as are those who are left or choose to stay in their home areas despite the risks they face in doing so. People with limited mobility, those dependent on carers or access to medical care and others with specific needs, such as older people, disabled people, women and children, are at particular risk in such situations, and the attention they receive should reflect that.

Figure 4.8 The evacuation process



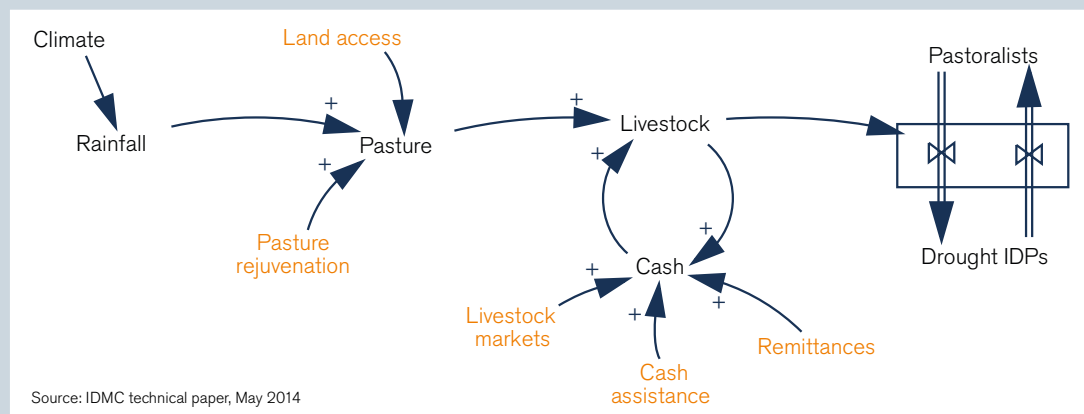
Source: Global CCCM Cluster (IOM/UNHCR/IDMC), The MEND Guide for Planning Mass Evacuations in Natural Disasters, pilot document, 2014

Box 4.1 Building understanding of drought-related displacement

IDMC has developed both conceptual and technical approaches to try to better understand and quantify displacement associated with drought, which - together with the impact of other gradual environmental processes - currently constitutes a significant gap in our global estimates. In 2014, IDMC produced a study that examined whether inherently mobile pastoralist communities could become displaced by drought, and if so, how.¹¹ The study informed our attempts to quantify the phenomenon using a system dynamics model developed in partnership with the NGO Climate Interactive.

The displacement of pastoralists is a multi-faceted phenomenon, and drought is just one of many factors that determine if it will occur (see figure 4.9). We found that livelihoods were crucial in this sense. If pastoralists' livestock holdings fall during a drought to below the threshold necessary to support their traditional way of life, they can be described as displaced even if they remain in their traditional grazing areas.

Figure 4.9 Simplified diagram of pastoralist displacement dynamics in Kenya

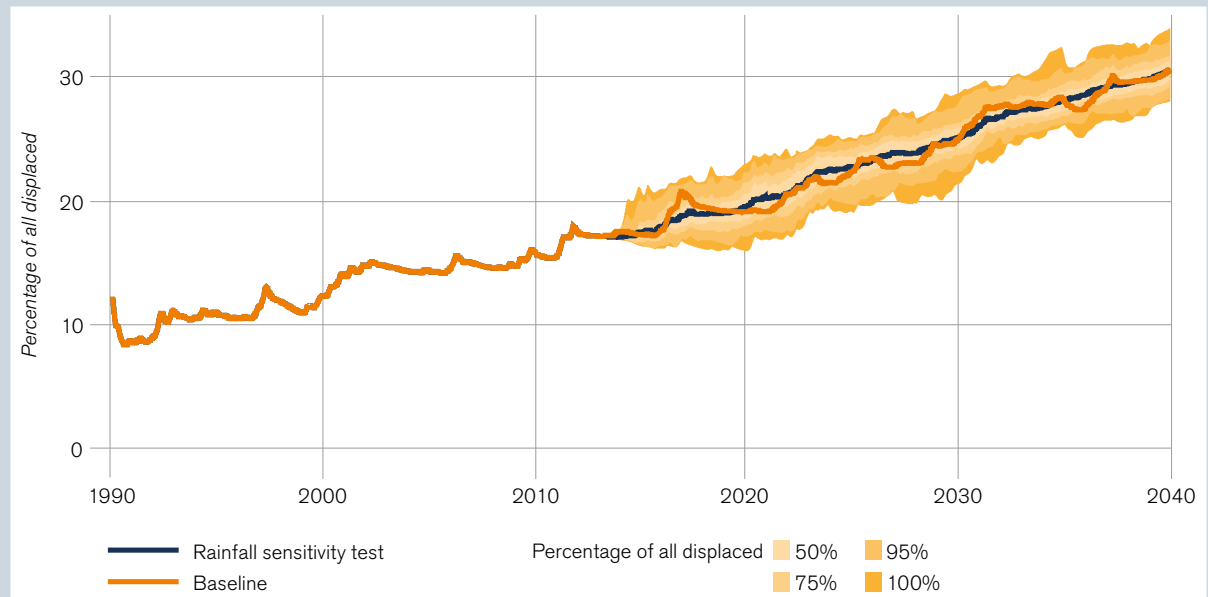


Source: IDMC technical paper, May 2014

After piloting the model in Kenya's North Eastern province, IDMC and our partner Climate Interactive expanded it to cover northern Kenya more generally, and to include cross-border displacement in to and out of Ethiopia and Somalia. The model allows us to predict both short-term (one to five years) and long-term (50-year) effects of climate and environmental changes, demographic trends, development and adaptation policies and humanitarian interventions (see figure 4.10). It also allows decision-makers to model the

potential effects of land use policies, urbanisation and population growth rates, investments in transport infrastructure, livestock marketing, herd composition and emergency veterinary services in order to see which programmes would be most effective under current and future conditions, including a changed climate.

Figure 4.10 Percentage of pastoralist population displaced in the context of drought in northern Kenya, southern Ethiopia and south-central Somalia: historical estimate and future projections



We found that human-related variables play a greater role in determining whether pastoralists become displaced than changes in the frequency and duration of droughts,¹² which implies that at least some displacement can be prevented.

Our estimates of the number of pastoralists and other people displaced in slow-onset situations rely on a bottom-up approach based on an understanding of communities' vulnerability. In order to arrive at an estimate, we need to know both the number of people exposed to the drought and how vulnerable their livelihoods are to it. Some livelihood strategies are more vulnerable than others. Farmers with access to irrigation or water storage are less vulnerable than those who depend entirely on rainfall.

One of the most challenging aspects of building the model and extending it in to Ethiopia and Somalia lay in obtaining good-quality data. In some cases it simply did not exist, in others it existed but was not made available, and in others still it was incomplete, outdated or not entirely credible. As a result, some parts of the model are more robust than others.

By way of an example, we obtained decadal rainfall data collected every ten days for the entire region from the Famine Early Warning Systems Network (FEWS NET) and its partners. We then derived the location of pasture area from government maps, and used academic studies on the effects of weather on grasslands to produce a realistic model of pasture productivity. Modelling livestock population dynamics in response to changing pasture conditions was more of a challenge, because monthly and sometimes even annual livestock population data is scarce for pastoralist areas. We calibrated figures by triangulating the livestock population data available with reported livestock birth and death rates in response to different climate conditions, and with market price data. Pastoralist populations were also difficult to estimate. Kenya's census data from 1999 and 2009 is contested and the most credible figures for Somalia were even more complicated. As a result, we had to develop dynamic population models for each of the regions we were studying.

In order to improve and expand our estimates of the number of people displaced in the context of drought, we plan to continue working long-term with our partner organisation Climate Interactive, national governments, local think tanks and regional institutions to extend and apply our system dynamics model to wider areas of the Horn of Africa and other affected regions. This may include the generation of figures for inclusion in future Global Estimates reports.

5

Countries with displacement caused by both conflict and disasters

Key findings and messages

- Those undertaking humanitarian and development initiatives should address complex displacement situations in countries affected by both conflict and natural hazards in a coherent and integrated way. In 33 out of 36 countries affected by armed conflict between 2008 and 2012, there were also reports of natural hazards forcing people to flee their homes. Measures to reduce disaster and displacement risk related to natural hazards may also reduce the risk of conflict driven by insecure livelihoods.
- The combination of conflict and natural hazards creates military and environmental obstacles to population movements, isolating communities and limiting people's options in terms of flight and destinations. Particular attention should be paid to the protection of those who do not have the freedom to move to safer locations and who are at risk of being trapped in life-threatening situations, including those displaced to locations near to their homes.
- Many people who flee a combination of conflict and natural hazards suffer repeated displacement, including those who take refuge in areas where they are then exposed to further risk. Disaster risk reduction measures and community-based livelihood strategies are needed to enable people to adapt to new shocks, prepare for future ones and prevent repeated cycles of displacement.
- Some IDPs return home relatively quickly following a flood or other natural hazard, but others do not. People who remain displaced for prolonged periods and whose situations are unknown may be among the most vulnerable and in need of particular assistance and protection. Continued monitoring is needed to ensure that their situations are not neglected and that they are able to achieve durable solutions to their displacement.
- More comprehensive and reliable data is needed to improve knowledge of displacement dynamics when people are exposed to multiple hazards, with the aim of informing holistic responses that reflect the severity of such crises and prioritise the protection of those most in need.

5.1 Where conflict and disasters combine

Natural hazards and conflict often act as interrelated drivers of vulnerability, crisis and displacement. It is often hard to separate out reasons for people becoming displaced in such situations. A study by the Overseas Development Institute, a London-based think tank, found that disasters tend to aggravate conflicts, and that conflict increases the impact of disasters by making people more vulnerable to natural hazards.¹ People displaced by conflict may be forced to take temporary shelter in areas prone to landslides or floods, for example, whether in camps or more dispersed settings. Understanding the complexity is key to ensuring an appropriate response.

Countries facing multiple and often recurrent risks tend to have only limited national capacity to deal with their scope and magnitude. Conflict undermines the ability of governments and NGOs to plan for the onset of natural hazards and protect people from them, whether it be via the enforcement of building regulations or the implementation of early warning systems and well-managed evacuations. South Sudan is a case in point, as described below.

Major disasters that affect fragile states, such as the 2004 Indian Ocean tsunami, the 2010 floods in Pakistan and the 2010 Haiti earthquake, have increased awareness of the concurrence of disasters and conflict, a phenomenon that is expected to become more common in the future. Between 2005 and 2009, more than 50 per cent of the people who suffered the impacts of disasters lived in fragile states affected by conflict.² Poverty is a central, underlying driver of disaster risk, and it is likely to be highly concentrated in such countries by 2025.³ The impact of climate change on both natural hazards and conflict is likely to complicate the situation further,⁴ with urbanisation, food price fluctuations and other stresses also affecting future trends.

In just over 91 per cent of countries (33 out of 36) affected by armed conflict between 2008 and 2012, there were reports of natural hazards causing displacement during the same period.⁵ In 2013 people fled their homes as a result of such events in almost three-quarters of the countries IDMC identified as suffering displacement caused by conflict and violence.⁶ Twenty-two were identified as having experienced new displacement caused by both conflict and natural hazards during the year.



For Sabah Abu Awad and her family, the thunderstorm Alexa in Gaza was particularly disastrous as their already impoverished house was completely flooded. More than a week later, they are still living at a generous neighbor's house but her children are already asking when they would be able to go back home. Thousands of other Palestinian families were displaced by the storm, houses collapsed, and farmers lost thousands of livestock.
Photo: Oxfam International, December 2013

The 10 countries with the highest new incidences of displacement in 2013 are shown in figure 5.1. The estimates may also include multiple displacements of the same people by a single, both or mixed causes. They do not take into account the considerable number of IDPs who were already living in prolonged and protracted situations, who continue to be displaced and who have subsequently been displaced again, as has been the case in South Sudan (see section 5.1). Different levels of displacement related to conflict and natural hazards in each country reflect their highly varied contexts. In many cases, the same people were displaced in overlapping situations involving both drivers, meaning that some double counting may have taken place.

Even when natural hazards do not cause new displacement, or the further displacement of people who have already fled conflict and violence, exposure to them makes the affected populations more vulnerable and complicates displacement dynamics. The combined nature of these and other risks is a daily reality for many of the people affected and displaced, as is the need for those responding to such complexity to do so in a coherent way.

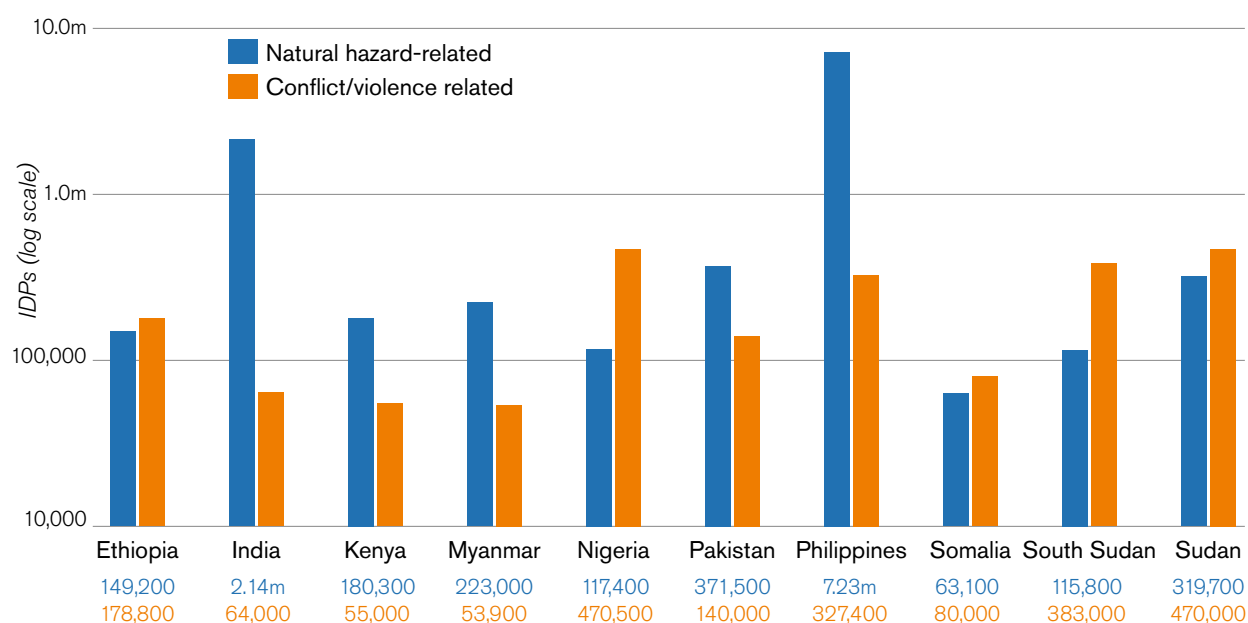
Conceptual and operational approaches, however, continue to address and prioritise disasters and conflict emer-

gencies separately, as do funding streams, mechanisms, mandates and centres of expertise. This is particularly true at the international level.⁷ It is often assumed that interventions in response to conflict are “political” while those that respond to “natural” disasters are, if not apolitical, then at least less political. Interventions in response to disasters, however, are not apolitical when inequality and bias create the potential for discrimination in the allocation of resources. Furthermore, the reputations and mandates of governments and other responders may be prioritised over meeting needs effectively, and external aid is influenced by non-humanitarian concerns. In situations where conflict and disasters combine this is even more pronounced.

Displacement related to disasters is becoming more widely recognised as an issue requiring specific attention, but it is still sometimes downplayed or dismissed as a temporary or marginal concern. This occurs in spite of the fact that displacement plays a central role in determining how many disasters evolve, the importance to long-term recovery of sustainable settlement and integration through return or relocation, and its disproportionate and repeated impact on highly vulnerable people.

Similarly, the risk of natural hazards in complex contexts cannot be treated as a peripheral issue for vulnerable

Figure 5.1 Ten countries with new displacement related to both natural hazards and conflict during 2013



Note: Log scale. Figures in thousands rounded to the nearest 100. Millions rounded to two decimal points. All figures relate to new IDPs only. Source of data: IDMC estimates, as of 22 August 2014

populations. Conflict management, disaster risk reduction, disaster management and protection interventions that fail to recognise all forms and phases of displacement have the potential to increase tensions and leave important risk drivers unaddressed. As such, they also undermine the central objectives of saving lives, reducing poverty, building resilience and protecting human rights.

5.2 Spotlight on South Sudan

Since South Sudan's independence in 2011, violence and natural hazards, including floods, storms, and drought, have caused significant displacement, and in many parts of the country they have combined to increase vulnerability and cause complex and recurrent mass displacement. The disruption of commercial and subsistence agriculture and of pastoralists' livelihoods has pushed much of the country into severe food insecurity. In July 2014, the UN Security Council described the food security situation in South Sudan as the worst in the world. IDPs living in dispersed locations outside formal sites and host communities in Unity, Upper Nile and Jonglei states are reportedly worst affected.⁸ All three states are prone to both conflict and floods.

The rainy season floods regularly cause displacement, including people who move away from flood-prone areas pre-emptively. They forced around 340,000 people to flee their homes in 2012, while 190,000 were newly displaced

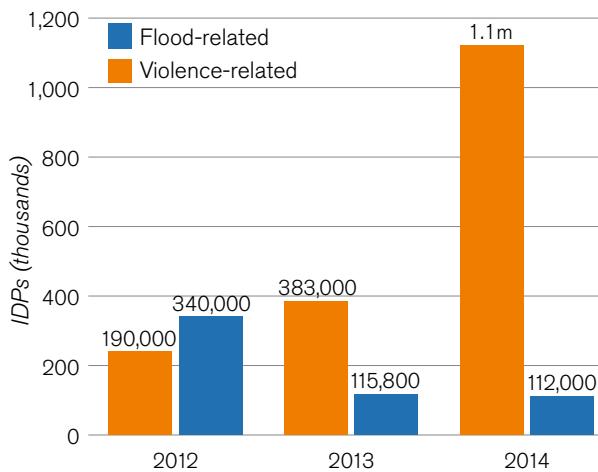
by violence the same year. The 2013 floods displaced 115,800 people, and conflict at least 383,000.⁹ Some of the states worst affected by the floods, such as Warrap, Unity and Jonglei, were also hosting the highest concentrations of people displaced by violence. The outbreak of nationwide conflict between government and opposition forces on 15 December 2013 led to a dramatic increase in the number of people displaced. Months before that, floods in Jonglei had displaced more than 30,000 people and violence 142,100, mainly in Pibor county. In Warrap, the state worst affected by floods in 2013, 43,000 were displaced, and another 1,000 by violence. The destruction of community infrastructure, markets and trade routes means that IDPs face greater risks as they are forced further afield in search of food, shelter and other forms of assistance and protection. Conflict and natural hazards also combine to create military and physical obstacles to movement by isolating communities and limiting people's options in terms of flight. Inaccessibility to flooded areas regularly leads to severe limitations on the delivery of relief and a lack of quality data on the most affected communities and their needs.¹⁰

A REACH Initiative assessment of the situation in 151 particularly flood-prone villages (63,084 households) in Warrap between June and August 2013 provides insights into displacement patterns that might be expected during the 2014 rainy season, though the escalation of conflict since December 2013 has the potential to alter the context considerably. The assessment found the highest average

number of displaced households were from areas where floods were less severe, “suggesting that communities with larger populations tend to be located in areas that were less affected by flooding, or that households in less affected areas found it easier to migrate temporarily as surrounding areas may have been easier to access.”¹¹ Most of the households surveyed only considered leaving their homes pre-emptively to avoid the floods after other preventative measures, such as the construction of flood defences, had been tried.¹² The assessment also shows how flood preparedness and mitigation measures can reduce displacement. Areas where dykes and channels were rebuilt following the 2012 floods, reported less displacement during the floods in 2013 than areas that were also affected but where such measures were not taken.¹³

The majority of people displaced beyond their local areas since the start of the rainy season were reported to have returned during the second half of the season. In all counties surveyed, however, up to 14.4 per cent of displaced households had not returned. This gap is also widely observed in relation to rapid-onset disasters in other countries. People who remain displaced for prolonged periods and whose situations are unknown may be among the most vulnerable, who are in need of particular assistance and protection. Regular monitoring of displacement over time is needed to ensure that their situations are not neglected.

Figure 5.2 New displacement related to violence and floods in South Sudan, 2012 - 2014



Note: Adding the conflict and natural hazard-related figures together to achieve a total figure for new displacement may include some double-counting of the same displaced people. Source of data: 2012 and 2013 figures, IDP estimates as of 22 August 2014 (IDMC). Flood-related figures as of 8 September 2014 (Dartmouth Floods Observatory), 42,000 IDPs for Unity state only (Floodlist). Violence-related figures for new displacement since January 2014, as of 21 August 2014 (OCHA).

As of May 2014, 1.48 million people were living in areas prone to flooding, including 475,000 people displaced by

conflict since mid-December.¹⁴ Rainfall from late June to August was above average across the country as a whole, and localised floods were reported as early as March, well ahead of the usual rainy season.¹⁵ Floods continued to make the already dire situation of people displaced by conflict worse, particularly in urban and peri-urban areas including Juba. The risk of respiratory, water-borne and other infectious diseases increased across the country, and the Wau Shilluck area of Upper Nile state, which hosts the second largest concentration of people displaced by conflict, suffered an outbreak of cholera.¹⁶

People who sought refuge from conflict in swampy areas of Jonglei state at the end of 2013 were displaced for a second time in three months as floodwaters made their overcrowded and unsanitary conditions worse.¹⁷ As of mid-May 2014, 475,000 of more than a million people fleeing the escalating violence had taken refuge in locations near Bor, including 95,000 who set up shelters along the banks of the Nile in Awerial.¹⁸ They had no information about the flood risk they faced there, and as the rainy season set in and the conflict continued, they found their temporary displacement to these areas prolonged despite worsening conditions caused by the floodwaters. By early September 2014, as many as 112,000 people were displaced by floods, including some 42,000 in Unity state alone as of 4 August (see figure 5.2).

For thousands of conflict IDPs sheltering in flood-prone civilian protection (PoC) sites within bases of the UN peacekeeping mission, relocation to better conditions on dry land became increasingly necessary during the 2014 rainy season. Two PoC sites were engulfed by floodwaters and thick mud as early as 7 March and 646 shelters were destroyed.¹⁹ Aid agencies, however, struggled to identify appropriate alternative land for all those facing renewed displacement.²⁰

That said, almost 12,000 people in Malakal, Upper Nile state, were moved to a new PoC site on higher ground following floods in May, in an effort to relieve congested conditions and clear stagnant water to curb the spread of cholera and other health risks.²¹ By the end of July, more than 32,000 people had been helped to move, and the number of relocations was expected to continue to rise as the rainy season progressed.

Some IDPs resisted relocation, citing security concerns including the threat of targeted killings and sexual violence. A large PoC site in Bentiu, Unity state was flooded at the end of July, destroying temporary shelters and causing conditions to deteriorate rapidly. Many people, however, were afraid to go beyond the site's perimeter, leaving them instead to sleep in flooded tents. Disease and malnutrition were reported as widespread, with around four children under the age of five dying each day.²²

Comprehensive information on the length and patterns of displacement is not available.²³ It is assumed that many people displaced by floods return quickly to their homes or other previous residences, as seen in Warrap in 2013, but the heightened vulnerability of those affected and the new population movements reported from the same areas each year point to likely repeated and protracted displacement. The number of IDPs displaced by conflict stood at around 1.1 million as of August,²⁴ but growing numbers were returning to their home areas, where they remained in need of assistance. Some 185,900 had done so as of 28 August.²⁵

In addition to causing displacement, floods and conflict also restrict the movement of people and hamper the humanitarian access needed for the delivery of emergency assistance and protection. Nearly 60 per cent of South Sudan becomes inaccessible by road during the rainy season,²⁶ and some people who need to flee find themselves trapped, whether by floodwaters or insecurity.²⁷ Having learnt from past failures, humanitarians have come to understand the importance of pre-positioning aid before the rainy season. Preparations for 2014, however, were set back by insecurity and the looting of stocks already pre-positioned. The looting also undermined preparedness measures.²⁸

While recognising the scale of the current conflict and the enormous needs it has generated, it continues to be important to ensure responses are also designed to address people's vulnerability to natural hazards. Better community-based disaster risk reduction measures are needed, especially as such initiatives also have the potential to reduce the threat of conflict linked to insecure livelihoods.

At the national level, the South Sudan Relief and Rehabilitation Commission (SSRRC)²⁹ is in charge of coordinating relief and reconstruction efforts in the aftermath of both conflict and disasters in areas under government control. The vast size of the country, however, low capacity, unevenly distributed resources and competition between ministries pose significant challenges, and the government has struggled to fulfil its leadership role in humanitarian and development coordination bodies. The current conflict has complicated the situation further, with the parties to it setting up parallel administrations in the areas they control. The government's cooperation with humanitarian organisations is also made more difficult by the fact that it is itself a party to the conflict.

In 2013, before the current crisis began, the government undertook efforts to address disaster risks, including the drafting of a national disaster management policy.³⁰ It also started to implement a five-year strategic plan on disaster management,³¹ and organised training for officials involved in disaster risk reduction and early warning

systems.³² The international humanitarian community also made efforts during the year to improve the integration of emergency preparedness into its approach, and it supported the government in developing a flood early warning system and vulnerability contingency plans.³³ Its work was hampered, however, by the political and security situation and funding shortages.³⁴

There is no panacea for such a complex situation, but the importance of peace and security to the achievement of sustainable solutions for IDPs and other vulnerable people is clear. It is equally clear that both humanitarian and longer-term development initiatives are necessary to support that goal. In the current situation, providing options for communities facing combined risks and ensuring that IDPs and others who face being trapped in life-threatening situations have the freedom to move to safer locations are critical to their protection. Flood mitigation measures and improved livelihood strategies that allow people to adapt to shocks related to both conflict and natural hazards are also vital. Piecemeal interventions based primarily on humanitarian structures, mandates and short-term responses are, and will remain, inadequate.

Together with greater political will, better resourcing and improved cooperation between humanitarian and development organisations, better data is needed as the basis for a more comprehensive understanding of displacement dynamics and community coping strategies, with the aim of ensuring that those most in need of protection are identified and prioritised for assistance.

Annex A: the methodology behind IDMC's global estimates

IDMC's annual Global Estimates report aims to provide a broad, quantified, global view of displacement associated with disasters brought on by natural hazards, based on the highest quality data possible. Depth is addressed in a more anecdotal way, via case studies and other specific examples that are representative of underlying patterns. These notes provide further details of the methodology we use to produce our global estimates and the modelled trends introduced in section 1.1 and box 1.1 of the main body of the report. The annex is divided into two parts. The first part covers the annual global dataset of measured estimates for 2008 to 2013, and the second the modelling of historical displacement trends from 1970 to 2012.

A.1 The annual measurement of displacement caused by disasters between 2008 and 2013

This section refers only to IDMC's annual global estimates based on direct reporting of displacement events. As explained in box 1.1, displacement is defined as the forced movement of individuals or groups of people from their homes or places of habitual residence, as described in the 1998 Guiding Principles on Internal Displacement. A rapid-onset shock in the form of a natural hazard may trigger such movements, as a result of its direct threat or impact on exposed and vulnerable people. The types of information used to monitor displacement include people reported as evacuated and people rendered homeless, as explained below.

This year's report presents the latest findings on displacement caused by disasters in 2013 and compares it with data on the six-year period from 2008 to 2013. We encountered regular challenges in the collection, compilation and interpretation of data from different sources, including varying institutional mandates, diverse research domains, differing terminology and definitions, and the variety of reasons organisations had for collecting and publishing the data in question. These are discussed further below.

Scope, resolution and limitations

Typological: These estimates cover disasters associated with rapid-onset geophysical, climate and weather-related hazards, as shown in table A.1. Drought and gradual processes of environmental degradation are also significant drivers of disaster and displacement risk, but they are not covered in this report. They are excluded

because a different methodology would be needed to analyse situations in which multiple stressors combine to create a point of crisis and displacement. Conceptual and methodological progress, particularly in relation to drought, is discussed in section 4.2.

Spatial/geographical: IDMC's data is monitored and collected with a broad global scope. We recorded displacement events induced by disasters in 161 countries over the six-year period from 2008 to 2013, and in 119 countries in 2013 alone. Event-based estimates can be aggregated to provide national, regional or global estimates, but the data does not allow for cross-event statistical analysis at the sub-national level. Nor is it currently possible to analyse the data by other location-related variables relevant to understanding exposure and vulnerability to hazards, such rural and urban settings, or mountainous, river basin and coastal areas.

We have increased our access to information at the country level over the past few years in a number of different ways: country missions by IDMC staff; cooperation with our colleagues in the Norwegian Refugee Council (NRC)'s country offices; and cooperation with other organisations such as IOM and IFRC that have country offices or national societies. Despite these efforts, our data compilation is still limited relative to the number of countries where displacement is known to have occurred. Our research is also limited by the working languages of our in-house experts, who work primarily in English, French and Spanish, and to a lesser extent in Italian, German, Russian and Japanese. That said, our access to local language sources has been improved through a partnership with IOM and its national and international staff.

For the purpose of this report, countries are defined as independent nation states. We do not analyse overseas territories or protectorates. For the few countries covered where sovereignty is contested - Kosovo/Serbia, Taiwan/China and Palestine - separate information was available and estimates were possible. The inclusion or exclusion of these and other contested territories does not imply any political endorsement or otherwise on IDMC's part.

Temporal: Data for each year since 2008 includes all identified displacements for which information was available from accepted sources as described below, and that started during the calendar year. It also includes a few events associated with disasters that started at the end of the previous year. In such cases, it was sometimes diffi-

cult to ascertain whether figures referred to displacement that began in the previous year or not, but we were careful to minimise the risk of double counting when a disaster, such as a period of flooding, ran from the end of one year into the beginning of the next. Consideration of a range of reports that described the disaster context as well as providing figures was helpful in this sense.

The estimates for each event or disaster represent the number of people reported as having become displaced at any point during them. They do not capture rates of return, the duration of displacement, the pattern of IDPs' movements after their initial flight or people living in prolonged displacement from one year to the next. For the time being, we are only able to report on repeated

and complex movements and protracted and unresolved situations anecdotally or via case studies. This represents an important gap in terms of identifying displaced populations likely to be at particular risk and in need of protection and sustainable solutions.

Demographic: IDMC collects its data in ways that aim to be as inclusive as possible of all people displaced and without bias towards particular countries, segments of a population or in terms of where IDPs take refuge.

The displaced population in any given situation is far from a homogenous group, but access to disaggregated data is very limited. Analysis using key metrics such as gender and age is only possible for specific situations or seg-

Table A.1 Typology of natural hazards

	Geophysical	Meteorological	Hydrological	Climatological
	Weather and climate-related			
Events/ shocks (rapid-onset)	Earthquakes: ground shaking, fault ruptures, landslides, liquefaction, subsidence, tsunamis and flooding	Storms: tropical storms (cyclones, hurricanes and typhoons), extra-tropical/winter storms, local storms (tornadoes, blizzards and snow storms, sand storms, hail storms, lightning)	Floods: land-borne or riverine floods (caused by heavy rains, snow melt, and breaking of banks), sea-borne or coastal floods (caused by storm surges and breaking of levees), flash floods (caused by snow melt run-off, dam bursts and sudden water release)	Wildfires: brush, forest, grass and savannah
	Volcanic eruptions: explosive or effusive, lava flows and mud flows, falling ash and projectiles, toxic gases, floods, landslides and local tsunamis		Wet mass movements: landslides, avalanches and sudden subsidence	Extreme temperature: cold snaps and extreme winter conditions, heat waves
	Dry mass movements: rock falls, landslides, avalanches, sudden subsidence and sink holes			
Processes/ stressors (slow-onset)	Long-lasting subsidence		Coastal erosion	Drought
				Desertification

This table provides a non-exhaustive list of the types of hazards included in IDMC's displacement estimates and historical trend model. They are those loosely classified as rapid-onset events, shocks or triggers of displacement. This list also mentions some of those hazards not included, in particular drought. Specific hazards are often part of a series of sub-events that may take place over hours or months as part of a disaster, such as aftershocks and other secondary hazards that follow a major earthquake, or floods and landslides during or after a period of heavy rainfall. Classification for the purpose of this report refers to the original or primary hazard that triggered the disaster and displacement.

Categories are based on the classification system used by the International Disaster Database (EM-DAT), maintained by the Centre for Research on the Epidemiology of Disasters (CRED) in Brussels.

ments of the overall displaced population. Were such data more readily available, it would enable the statistical analysis of patterns and trends in the differentiated needs of people within and across diverse displacement contexts.

Higher quality data is usually limited to IDPs living in collective sites or settings, where they are assessed in more detail for operational purposes. Data on displaced people in dispersed situations outside official camps or collective sites is another important gap. This limits the ability of governments, humanitarian and development organisations and donors to prioritise where assistance is most needed.

For the purpose of this report, greater weight is given to providing as comprehensive an estimate of new displacement as possible, including IDPs living with host communities and in other dispersed settings, both in and outside the areas affected by a given disaster. As a result, the overall estimate for an event will be based on broader but less granular information sources if they are available. In many cases, however, the only information we are able to identify refers to a particular segment of the displaced population, such as those living in officially recognised collective sites, and the displacement figure we record is likely to be an underestimate.

Event-specific data

IDMC only records new incidences of displacement in its annual datasets when the information available allows event-specific estimates to be made. We do not use figures that we are unable to break down because they are reported already aggregated at the national level, for a whole year or by type of disaster. This ensures consistency and comparability across the data captured. In a few cases, we were unable to incorporate official aggregated statistics made available to us into the dataset. It is worth noting, however, that in all of these cases the official statistics gave a higher estimate of displacement for the country or type of disaster than our own, probably because some events were missing from our data and/or because we underestimated the displacement involved in one or more of that year's events.

Defining a displacement event

The data behind the annual global estimates and longer-term modelled trends include displacements of all sizes, ranging from a few records of only one person being displaced to mass displacements of more than 15 million people. The data compiled for 2013 includes more than 600 events, of which 375 displaced at least 100 people. Thirty-seven involved the displacement of between 100,000 and a million people, and there were six mega-scale events in which more than a million people were displaced. There were 34 mega-scale events between 2008 and 2013.

We compile our data without any lower threshold on the size of the displacement recorded. Where necessary, we used a threshold in our analysis to eliminate any bias caused by the irregular reporting of small events, by excluding those that displaced fewer than 100 people. The data sources available and our methodology create a bias towards larger, more visible and more widely reported events. Lesser disasters that cause frequent small-scale displacements are included for countries where this type of detailed information is available, such as Indonesia. From these, we can infer that small-scale events are significantly under-reported for most countries, as discussed in section 2, box 2.1.

Classifying and defining a disaster event period associated with displacement can be challenging, given that it may be difficult to determine its start and end date, its geographical scope and its complexity beyond the direct and initial impact of the hazard. In reality, a disaster usually involves a number of sub-events and phases. This is particularly true of displacement across wide areas during successive periods of heavy rain together with secondary impacts such as landslides, or when similar events happen in parallel or close succession in the same country or locality. As the Dartmouth Flood Observatory notes: "Repeat flooding in some regions is a complex phenomenon and may require a compromise between aggregating and dividing such events."⁶ This issue does not change the overall number of people estimated as displaced, but it does affect the number of events recorded and analysis of those events according to their size.

The 2013 data includes a significant increase in the recording of smaller-scale extensive disasters. Highly detailed information on a large number of small local events was aggregated when they were clearly identifiable as related to a main weather system, flood season or other hazard, including secondary hazards such as landslides during a period of flooding. This type of aggregation is often used in the international reporting of disasters, and we applied it to 40 disasters in 10 countries. Better data provision and storage means that detailed records of the sub-events are maintained on our database, to facilitate more granular analysis in the future.

Our data also includes reported disasters for which no displacement was recorded. If information was not available to compile an estimate in accordance with our methodology, this was recorded as "no data available", while events for which sources explicitly stated that no displacement occurred were recorded as "zero displaced". The difference is important to note, because it is much more common for the scale of displacement associated with an event to be unknown than confirmed as zero.

In some cases, people fleeing a natural hazard or disaster were already living in displacement before it struck. If it was clear, for example, that people already displaced by conflict were then forced to flee again by an event such as the flooding of a displacement camp, their new movements were recorded as 2013 displacements caused by a natural hazard. It should be noted that only limited information is available on such displacements, meaning that the dataset captures only a small number of them and they are likely to be under-represented.

Sources of information

IDMC regularly reviews the various types of information released by different sources on the number, needs and characteristics of displaced people, primarily by gathering and monitoring secondary reports. We systematically seek a range of sources for each country and each disaster. For our 2013 estimates, we increased our research capacity and accessed data from sources including the Asian Disaster Reduction Centre (ADRC)'s GLIDE website, IFRC's disaster management information system, OCHA and other UN agencies, IOM, humanitarian cluster situation reports, government reports and national disaster loss databases, and NGO reports. Reputable media sources provide citations of government officials and local authorities in affected countries. For small events, local media reports are often the only source of information available. IOM country offices provided field data and/or gave us access to official sources that we incorporated into our data for 28 countries.

Selection and calculation of estimates by event or disaster

For the purpose of providing global estimates, IDMC aims to arrive at the best approximation of the total number of people displaced by a specific event or disaster, measuring the incidence of displacement rather than the evolution of the number of people displaced and their movements and situations over time. Our analysis and interpretation of information from multiple sources includes the cross-checking of reported locations and dates to ensure that figures are associated with the same disaster and time period, and that double counting is avoided or minimised. All new incidences of displacement during a given event or disaster period are recorded, which requires the analysis of reporting dates and the consideration of series of situation reports.

The estimate per event is selected according to the most accurate and reliable figure provided or calculated based on a single source, or combined sources when it is clear that overlap and double counting can be avoided. The number of sources available varies according to the scale of the event, from one or two for smaller events to more than four for larger events, disregarding those that republish original information from elsewhere. Disasters widely

covered by media, or which continue for long periods of time, also tend to have more sources from which to draw.

A wide range of terms - such as evacuated, homeless, damaged and destroyed housing, fled, relocated and affected - definitions and methods are used for collecting and reporting figures, and they are used in different ways by different sources. Such variations arise in part from the different purposes organisations have for collecting and reporting their data in the first place. In operational settings, the term "displaced" is often applied more narrowly than IDMC's definition. It may be used to indicate only those people staying in official collective sites or camps, or only people displaced a certain distance from their homes.

In some operational contexts, evacuees who move to official, short-term evacuation centres are counted separately from displaced people in official camp-like shelters. In others, evacuees are counted as a subset of the displaced population. Displaced people are sometimes counted as a sub-set of the affected population, and sometimes as additional to them. Information describing the context and point in time at which displacement is reported, knowledge of typical patterns observed in similar contexts and the quality and reliability of different sources are also taken into account.

We interpret the data we collect using the same broad and inclusive definition of displaced people across all events worldwide. Our definition assumes that displaced people are part of the population affected by a disaster, though this does not imply that those affected have necessarily been displaced.² We consider evacuees to be displaced people whether or not their evacuation was pre-emptive (see box 1.1), and we define people whose homes are rendered uninhabitable as displaced, regardless of where they are displaced to, how near or far from their homes they move and whether they are able or not to return.

We recognise that different situations create different types of needs, but our research indicates that being displaced further away does not necessarily imply greater needs or vulnerability. Indeed, displacement over short distances, especially when recurrent, may be a better indicator of vulnerability, given that those affected may face limitations on their movement to safer locations or places where they have better access to assistance.

Evacuation data: In addition to people directly reported as displaced, having fled or been forced to leave their homes, one of the most common types of data used to estimate event-based displacement comes from mandatory evacuation reports and official evacuation centres. The number of people reported as staying in evacuation

centres may underestimate the total number of evacuees, given that some may take refuge at unofficial sites or with family and friends. On the other hand, the number of people ordered to evacuate may overstate the true number of evacuees, given that some will usually not heed the order and remain in their homes. The potential for such discrepancies is much greater when authorities advise rather than order evacuation, and as a result we do not incorporate such figures into our estimates.

Data on people made homeless and uninhabitable housing: People made homeless because a disaster renders their homes or habitual residences uninhabitable are considered displaced. Their number may be reported directly, or we infer it based on the number of homes reported as severely damaged or destroyed, multiplied by the average household size for the country in question. In the absence of international and standardised average national household size information for all countries, we apply a consistent calculation by assuming two adults per household plus the total national fertility rate, as provided by UN Statistics for 2010 to 2015. We do not use data on housing reported simply as damaged, because the term is too broad to determine whether it has been made uninhabitable or not unless the source itself makes the fact clear.

Data on homelessness also points to the risk of prolonged displacement and the severity of the situation. Areas where homes and community infrastructure have been severely damaged or destroyed are unlikely to be able to support early safe returns. Migration from rural to urban areas, a lack of social housing for poor families, the unplanned growth of informal settlements and the failure to implement building standards for disaster-resilient housing puts millions of people at risk of being made homeless, with the poorest being the most vulnerable.

Reporting bias

Given the issues discussed above, IDMC's overall annual estimates are likely to underestimate the scale of displacement around the world each year. There are a number of causes of bias that should be noted, both in our source information and our methodology:

- It is often difficult to determine whether displacement data for many countries and situations is reliable and comprehensive. Global reporting tends to emphasise large events in a small number of countries where international agencies, donors and media have a substantial presence, or where there is a strong national commitment to, and capacity for, disaster risk and information management. Information on smaller-scale disasters is far scarcer and on the whole significantly under-represented. The effects of disasters on isolated and insecure areas also tend to go relatively unreported because access and communications are limited.

- There tends to be significantly more information available on displaced people in official or managed collective sites than there is on those living with host families and communities or in other dispersed settings. Given that the majority of IDPs usually fall into the second category (see section 2.1.3), figures based on data for collective sites only are likely to be substantial underestimates.
- Reporting tends to be more frequent but also less reliable in the most acute and highly dynamic phases of a disaster, when peak levels of displacement are likely to be reached. It becomes more accurate once there has been time to make more reliable assessments. This means that estimates based on later evaluations of severely damaged or destroyed housing will be more reliable, but they are also likely to understate the peak level of displacement, given that they will not include people whose homes escaped severe damage but who fled for other reasons.
- It should also be noted that reporting bodies may have interests in manipulating the number of people displaced. They may be to maximise the potential for receiving external assistance, downplay the scale of a disaster if the government may be held accountable, or because international attention is deemed politically undesirable.
- A time delay in the updating of national and international disaster loss databases means that some information was not available in the research period for this report. The 2013 dataset did, however, include information from more national disaster loss databases than in previous years because it has been scheduled for publication a few months later.

Improvements in the systematic collection and sharing of reliable information on displacement are essential if we are to continue to improve the quality of our reporting and monitoring - a critical first step in identifying needs, prioritising assistance and informing longer-term solutions.

Data contributions and review

Ahead of this year's report, IDMC's event-based datasets for 2008 to 2013 underwent significant improvements in terms of normalisation and standardisation, which has increased the type and quality of analytics we can run. We also made a substantial effort to increase the background information we collected for displacement events. The process for screening all data and estimates has also been improved, including the introduction of more thorough checks by two additional in-house researchers, a focused review of all larger events, and the review of country data by IDMC analysts in consultation with in-country contacts and NRC country offices. IOM field and liaison offices around the world also provided extensive inputs, and our REACH Initiative partners reviewed data from a number of countries where they maintain a presence.

We also carried out a review of our previous data from 2008 to 2012 in order to better standardise our database. Our first Global Estimates report, for 2008, added figures for displaced people to those for evacuees, but our methodology for 2009 to 2013 works on the assumption that the two sets of figures often refer to the same people. As such, the review aimed to eliminate any double counting in our 2008 data and improve comparability across the last six years. For the 100 events that displaced more than 5,000 people, the sources were double-checked and additional research was carried out to verify our estimates. A small number of corrections and updates were also made to our estimates for 2011 and 2012, based on errors identified and new information brought to our attention.

To improve the quality and comprehensive nature of the data we use to produce our global estimates each year, we collaborate with an increasing number of partner organisations, and incorporate lessons learned from previous years. Feedback on our work and suggestions for the future are always very welcome.

A.2 Modelling displacement trends from 1970 to 2012

IDMC expanded the evidence base for this year's Global Estimates report by including 43 years of historical data on disaster impacts, which we used to model displacement trends from 1970 to 2012. The main reason for doing so was to provide a broader historical context for displacement associated with disasters, because our dataset for 2008 to 2013 covered too short a period of time to detect and analyse long-term trends and patterns. The exercise also helped bring to light patterns and relationships between displacement and other variables. It made clear, for example, that there can be huge variations year to year in the number and type of hazards that occur, and in the amount of displacement they cause. Some hazards occur frequently and with relative predictability, perhaps numerous times a year in a particular country or region, while others may happen once every 500 or 1,000 years worldwide. This is an important consideration when one takes into account the natural human tendency to draw conclusions from available data. Our dataset for 2008 to 2013 is reasonably accurate, but it is not necessarily representative of any other six-year sample in the last century, nor is it alone a good basis on which to predict future displacement trends.

We undertook our trend-based analysis with several important caveats in mind. First, the sample sizes are too small given the available data to make inferences about individual countries. This applies particularly to small territories and populations, and those relatively unexposed to hazards that only occur rarely, both of which may only

be recorded a few times if at all in either the six or 43-year datasets. Trends based on region, continent or other means of grouping countries with similar characteristics together are more likely to produce accurate and meaningful results. It is also important to note that the 1970 to 2012 trends were modelled and subsequently calibrated using datasets that overlap for only a five-year period from 2008 to 2012. We obtained the additional data for the analysis, covering 1970 to 2007, from the EM-DAT international disaster database³, national disaster loss databases⁴, and datasets from the World Bank, the UN and other demographic sources.

At first iteration, the modelled displacement estimates provided some validation of observed patterns. They also shed light on some interesting relationships between datasets and trends. Taken as whole, the exercise highlighted opportunities for future research and for the improvement of our analysis of displacement patterns, both in terms of underlying data and modelling methodology.

The expansion of our dataset to include close analysis of major historic events and successive years of displacement data has created a much larger sample size for future calibration efforts. Successive iterations of the model using improved and expanded data, together with ongoing refinements to the calculation methodology, should reduce uncertainty in future analyses and expand their descriptive and predictive capacities.

Datasets used for modelling displacement

We used direct proxies for displacement in the creation of our dataset covering 2008 onwards, including evacuation figures, people living in temporary shelter sites and homes destroyed. Comparable direct, high-quality and consistently recorded proxies are not, however, readily available at the global level for the entire 1970 to 2012 period.

Given the limited availability of such data, we used direct proxies such as recorded homelessness data, or figures for people requiring shelter during a disaster, with indirect proxies such as the number of people affected and the number of people killed – some of the most common types of data collected for disasters on a historic basis. At the global level, EM-DAT is the most thorough and most often cited database of disaster impacts and losses that tracks these variables.⁵ Data on the number of homes destroyed, for example, is a particularly good proxy for displacement in earthquake scenarios. Disaster-related mortality may, at first glance, seem an strange proxy for displacement, but statistical analysis shows that for certain hazards, such as floods, there is a correlation between the number of people killed and the number displaced.

At the national level, a growing number of countries have begun to develop disaster loss databases using the DesInventar methodology, which provides disaggregated and geospatially referenced data on a number of disaster impacts and variables. National DesInventar databases were first implemented in Latin America in the late 1990s to satisfy a need for disaggregated, local-level information on disaster losses in order to better understand patterns across territorial, political and economic zones. In many cases, the databases contain very detailed information across a wide range of categories according to each country's specific information needs. Given the nature of the data involved, efforts to build and maintain them have often involved civil society organisations, drawing on their extensive access to local-level information. Such linkages between civil society and government agencies foster better disaster risk management by bringing relevant stakeholders together, which in turn leads to improved outcomes at the local level.

As each country administers its own DesInventar database, there are slight variations in structure and more significant variations in data entry, coverage and thresholds - such as the number of deaths or people affected - which determine whether an event is included. Most, however, record information on a wide range of indicators, from damage to health facilities to secondary and downstream economic losses.

In both the EM-DAT and national databases, mortality data is of better quality than that on people affected or rendered homeless. The difference in quality also varies from hazard to hazard. Homelessness data, for example, appears to be most accurately represented for earthquakes, and least well-tracked for smaller floods. Disasters linked to storms and major floods have both the highest number of entries and largest total figures for people killed, affected or left homeless. Given the larger sample size available for these hazard types, subsequent results and analyses are generally more robust.

Disasters linked to frequently occurring and localised hazards such as landslides and small seasonal floods receive substantially less attention because of the difficulties in collecting data on so many events, and differences in methodology such as the thresholds used for inclusion. EM-DAT's threshold for including an event is 10 deaths or 100 people affected, which means that the data is likely to be biased towards events in which one or both of these metrics are met, and against events during which homes are damaged or destroyed and livelihoods lost or severely disrupted. This is just one example of a bias that makes analysis challenging. Similar variability occurs across hazards and loss metrics as well as databases.

Modelling and calibration with the 2008 to 2013 dataset

Our 1970 to 2012 model was calibrated using our high-quality 2008 to 2013 dataset. Country, hazard type and annual data from both were compared. It is important to note that the overlapping years between the datasets provide only a limited sample, which may not be representative of disaster impacts and displacement over the 1970 to 2012 period. We will address this limitation by continuing to research additional years and past events.

Three iterations of the process were run, seeking to improve the predictive capabilities and reduce sources of uncertainty in the results generated by the historical model. The procedure benefitted substantially from the improvements to the 2008 to 2013 dataset mentioned above, and both employ a similar data structure, extending analytical capacities and enabling direct comparison between them.

The first iteration, based on EM-DAT disaster loss data, applied a "naïve" multiplier across all hazard types. This had the benefit of providing a rough estimate without any significant variance issues, but it failed to produce a good fit in terms of underlying hazard, country and annual data when compared with the events in our existing dataset for 2008 to 2012.

The second iteration used regression coefficients for each hazard, where possible, and generic values for hazard types with limited samples. This meant that the impacts of different hazards were weighted more realistically. The third iteration sought to address some of the challenges the second model raised by using relative values and increasing the sample size of disaster events.

The second and third iterations were calibrated using coefficients obtained from regression analyses between our annual displacement totals by country and year for 2008 to 2012, and equivalent annual mortality, affected and homeless data by country from EM-DAT. For most hazard types, the regressions were run with data corresponding to each one. For hazard types with limited data - landslides triggered by earthquakes, for example - values were obtained from regression analysis across all the hazard types we identify.

Given the limited sample sizes, the divergence of exogenous variables over the 1970 to 2012 period was much larger than in the 2008 to 2012 sample used for the regressions. As a result, some entries appeared as extreme outliers, thereby skewing the results. Several approaches were taken to deal with the most extreme outliers generated in the second iteration of the model, including scaling values to mortality, affected, homeless and displaced figures expressed per million inhabitants.

Preliminary results

The third iteration of the model provides some validation of expected displacement patterns, and analysis of the results identified new avenues for future research. The initial results presented here are compared with global trends in the key metrics on which the model is based, for example people affected by disasters, people killed by the same type of disaster and people reported as left homeless by disasters over the same period of time.⁶

The overall model shows a clear upward trend over the past four decades, with displacement associated with all types of weather-related hazards and earthquakes increasing. The model also suggests that the average number of people displaced each year has doubled since 1970, with displacement associated with floods rising fastest (see figure A.2). The trend mirrors the increase in the number of people affected by the events in question, which is assumed to include people displaced as per IDMC's definition (see figure A.1a).

The number of people rendered homeless by disasters has also increased since 1970, albeit at a slower rate than those displaced. Not all people who are displaced have necessarily been left homeless or in need of shelter assistance. They may have fled pre-emptively to avoid a potential threat to their safety, or because they no longer had the access to land, livelihoods and services required to meet their basic needs (see figure A.1b).

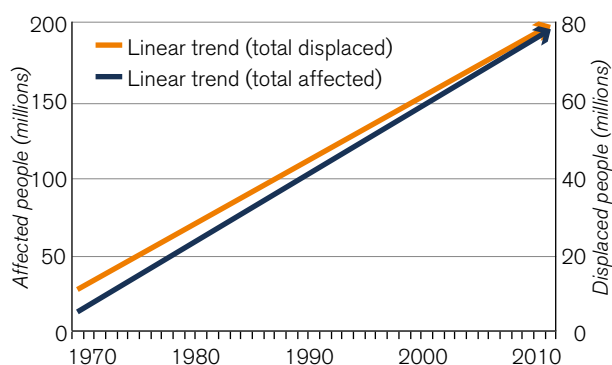
The number of people affected by disasters rose significantly over the 43-year period, but absolute mortality related to all types of hazards combined increased only slightly,⁷ pointing to improvements in preparedness, early warning systems and other life-saving measures (see figure A.1c). If the trend continues, disaster-related mortality may become a weaker proxy for displacement. If there are fewer fatalities relative to the number of people affected, it is likely to mean that more people are being displaced.

The affected, homeless and mortality metrics underlying the model exhibit different patterns over the 43-year sample period. The average number of recorded disasters and people affected both increased substantially, but the consensus points to a relatively flat trend in the number of people killed, and a decreasing trend in the number of people killed relative to the total population and those exposed to hazards. Increases in other categories are commonly attributed to a combination of greater exposure and improved reporting.

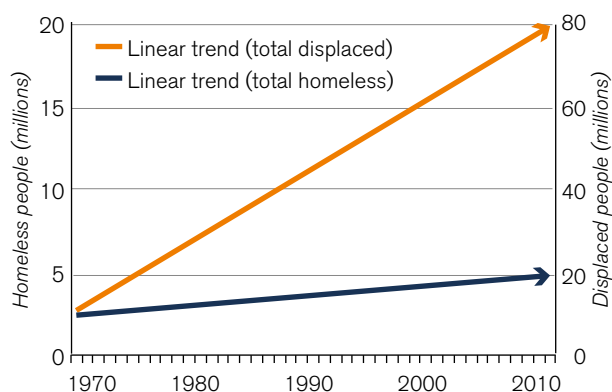
The metrics also exhibit different patterns based on hazard type and other exposure-related variables. The relationship between a rising displacement trend and an almost flat mortality trend, for example, can be seen most clearly in the modelled results for storms. There are likely

Figure A.1, a-c: Modelled historical displacement trend compared with people affected, rendered homeless and killed by disasters, 1970-2012

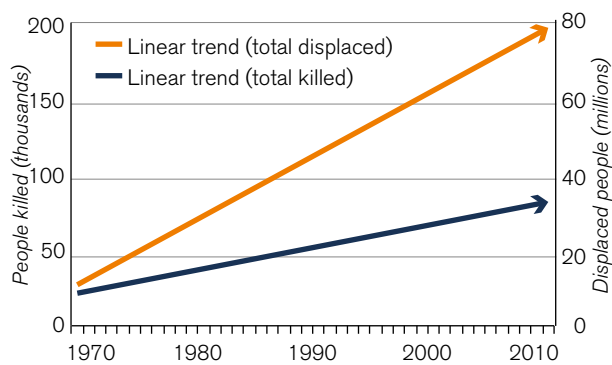
A. Displaced compared with affected population



B. Displaced compared with people rendered homeless



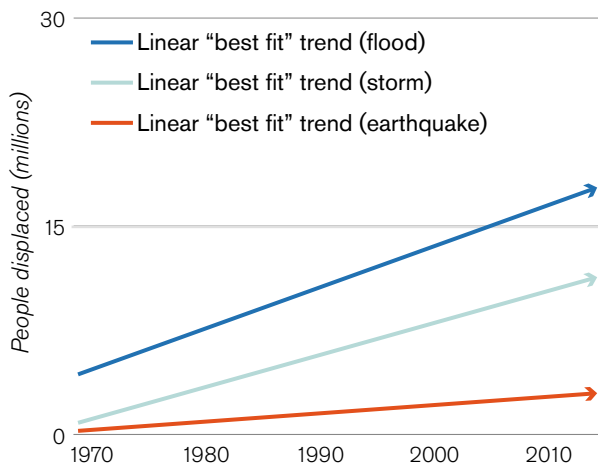
C. Displaced compared with people killed



Source: IDMC-modeled trends as of 22 August 2014

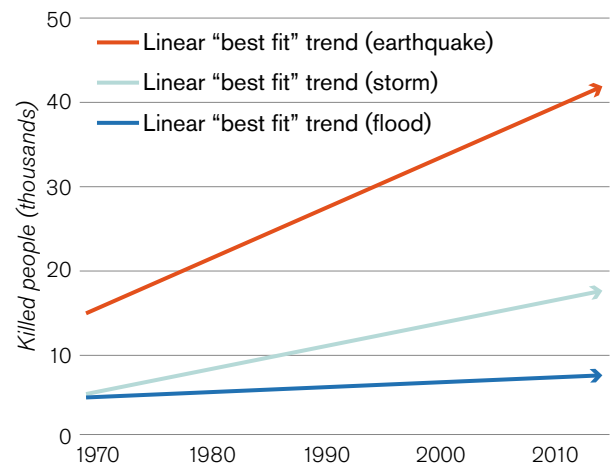
to be a number of reasons for this. Storm-related deaths may have fallen thanks to improved weather forecasting, early warning systems, pre-emptive evacuations and disaster preparedness. At the same time, rapid, poorly planned and unregulated development means that increasing numbers of people are exposed to hazards and may be forced to flee their homes.

Figure A.2 Modeled displacement trends by hazard type, 1970-2012



Source: IDMC-modeled trends as of 22 August 2014

Figure A.3 Disaster mortality trends by hazard type, 1970 - 2012



Source: IDMC-modeled trends as of 22 August 2014

Flood mortality data correlates very closely with modelled displacement. This is indicative both of fewer flood-related deaths being recorded relative to other types of disaster, and of the way the model weighted flood mortality to estimate historic displacement (see figure A.3). An early conjecture on this relationship could be that small, localised floods are relatively easy to escape, while larger more widespread floods that trigger major displacements pose a higher risk of mortality and entail greater risks associated with mass movements of people, some of whom are unable to flee to safety. More exhaustive causal analysis and significantly more and better data is needed to identify and understand such underlying relationships.

Earthquake data shows a rising trend for both displacement and mortality, indicative of the lack of advance warning such events allow for, and the importance of long-term risk reduction measures such as building and zoning regulations that reduce exposure and vulnerability in high-risk areas. It also demonstrates the highest correlation between modelled displacement and homelessness figures, and as such is weighted by the regression model coefficients to rely more heavily on this data than the other hazard types.

There is relatively little data on volcanic eruptions, landslides, wildfires and extreme temperature events with which to compare the 1970 to 2012 and 2008 to 2013 datasets. As a result, the modelled displacement estimates generated for these hazards must be interpreted with particular caution and are not included in the graphs above (see figures A.2 and A.3).

Next steps

Several potential areas of improvement have been identified for the next iteration of both the 2008 to 2013 and 1970 to 2012 datasets. Further investigation into causal relationships between underlying risk drivers and displacement is also envisaged, stemming from the increased analytical capacities of both datasets. This includes comparison with demographic, social, economic, land-use, governance and other variables. Ongoing improvements in data management, review tracking and source document archiving continue to improve the depth and breadth of the datasets.

An expansion of event-by-event coverage to include prominently large displacements over recent decades, and to focus on hazard types for which sample sizes are highly limited, will help increase the robustness of the calibration algorithm. Event-by-event matching between the 2008 to 2013 and the historical data, at least for the top 50 per cent of entries, would also help address another limitation in the current model - the compilation of annual data by country, rather than event-by-event, means that some events that caused large disaster losses may skew the annual estimate for the country in question.

One last limitation to note is that disaster loss data was compiled on an annual basis, both to keep the size of the dataset manageable and, more importantly, to enable matching by year, hazard and country between the two datasets. Otherwise calibration of the historic loss data would be impossible. To address the issue, more event-by-event matching between the two datasets is planned to further validate and expand on the data and findings to date.

Annex B: Largest displacement events of 2013

Largest displacement events of 2013 (all events, 100+ displaced people)

	Country	Hazard event	Affected areas	Figure source(s)*	Month	Total displaced (people)	Displaced per million inhabitants
1	Philippines	Typhoon Haiyan (local name: Yolanda)	36 provinces in 9 regions: VIII (Eastern Visayas), VI (Western Visayas) and VII (Central Visayas) hardest hit. Also, IV-A (Calabarzon), IV-B (Mimaropa), V (Bicol), X (Northern Mindanao), XI (Davao) and XIII (Caraga).	Govt: NDRRMC	November	4,095,000	41,665
2	Philippines	Typhoon Trami (local name: Maring)	Luzon island group: Central Luzon (region III) and Metropolitan Manila (national capital region)	Govt: DSWD	August	1,744,000	17,744
3	China	Floods	12 provinces in east, central, south, south-west and north-west China: Sichuan, Yunnan, Shaanxi, Gansu, Inner Mongolia, Anhui, Jiangxi, Hunan, Guangxi, Guangdong, Chongqing and Shandong	IFRC: Red Cross Society of China	June-July	1,577,000	1,159
4	Bangladesh	Tropical cyclone Mahasen	Chittagong division and Barisal division: Cox's Bazaar, Noakhali and Barguna districts hardest hit	IFRC: Red Cross Society of Bangladesh	May	1,100,000	7,122
5	India	Floods	Bihar, Kerala, Uttarakhand, Assam, Andhra Pradesh, West Bengal and Uttar Pradesh states	Govt: NDMA	June-October	1,042,000	818
6	India	Tropical cyclone Phailin	Eastern coastal areas: Odisha and Andhra Pradesh states	Media: AFP (Govt: NDMA)	October	1,000,000	785
7	China	Typhoon Fitow	Eastern coastal province of Zhejiang	IFRC: Red Cross Society of China	October	826,000	607
8	Vietnam	Typhoon Haiyan	Central provinces: Quang Ngai, Thua Thien-Hue and Quang Nam	OCHA (Govt: CCFSC)	November	800,000	8,825
9	China	Typhoon Usagi	Southern coastal province of Guangdong	Media: Xinhua	September	587,000	431
10	China	Typhoon Utor	Southern coastal province of Guangdong	Media: Xinhua	August	513,000	377
11	China	Typhoon Soulik	Eastern coastal provinces of Zhejiang and Fujian, and neighbouring Jiangxi	Media: AFP	July	500,000	368

12	Philippines	Typhoon Nari (local name: Santi)	Luzon island group: Central Luzon (region III) and Catanduanes province (Bicol region)	Govt: DSWD	October	406,000	4,131
13	China	Floods	Northern-eastern provinces of Heilongjiang, Jilin and Liaoning	IFRC (Govt: MCA)	July-August	354,000	261
14	Philippines	Bohol earthquake	Visayas island group: Central Visayas (region VII), Bohol (epicentre in Sagbayan), Cebu and Negros Oriental	Govt: NDRRMC	October	349,000	3,546
15	Sudan	Floods	15 states: Khartoum, River Nile, Gazira, Northern, Sinner, Red Sea, Blue Nile, South Darfur, White Nile, North Darfur, Kassala, West Kordofan, North Kordofan, South Kordofan and Gedarif	IFRC: Humanitarian Aid Commission	July-September	320,000	8,927
16	Japan	Typhoon Man-yi	Kyoto, Aichi Prefecture, Osaka and Shiga prefectures	Govt: Cabinet Office	September	260,000	2,060
17	China	Gansu earthquake	Minxian and Zhangxian counties (Gansu province)	Media: Xinhua	July	227,000	167
18	Philippines	Tropical storm Shanshan (local name: Crising)	Central Mindanao: Davao Oriental, Maguindanao, Agusan del Sur, North Cotabato, South Cotabato and Compostela Valley provinces	Govt: NDRRMC	February	223,000	2,271
19	Erratum. Please see note on page 2.						
20	Niger	Floods	566 villages affected in 8 regions: Dosso, Maradi, Tillabery, D'Agadez, Zinder, Niamey, Diffa and Tahoua	Govt: Office of the Prime Minister	April	201,000	11,658
21	China	Lushan earthquake	Sichuan province, Lushan county (epicentre in Ya'an)	IFRC: Red Cross Society of China	April	193,000	142
22	China	Typhoon Trami	Eastern coastal province of Fujian	IFRC: Red Cross Society of China	August	190,000	140
23	Sri Lanka	Floods	Northern Sri Lanka	IOM (Govt: DMC)	January	190,000	8,851
24	Mozambique	Floods	Gaza province	UN Resident Coordinator (Govt: NEOC)	January	186,000	7,390
25	China	Typhoon Haiyan	Southern China, Hainan province	IFRC: Red Cross Society of China	November	181,000	133
26	Pakistan	Baluchistan earthquake	Baluchistan province	Govt: NDMA	September	170,000	925

27	Kenya	Floods	Marsabit, Isiolo and Garbatulla counties (Eastern province); Naro, Nakuro and Kajiado counties (Rift Valley province); Mulanjo, Kilifi and Tana River counties (Coast province)	IFRC: Red Cross Society of Kenya	March-June	170,000	3,862
28	China	Hainan floods	Southern coastal province of Hainan, including Hainan island	Media: Xinhua	December	150,000	111
29	Ethiopia	Floods	Dasenech and Sankura Woredas (SNNPR), Kabridehar, Ferfer, Kalafo, Mustahil, East Emey and Dabowein Woredas (Somali region); Zuria and Lare Woredas (Gambella region); Abaya and Gelana Woredas (Oromia region)	IOM	April-September	146,000	1,636
30	Cambodia	Floods	Banteay Meanchey, Siem Reap, Batambang, Kampong Thom, Ratanak Kiri, Stung Trung and Kampong Cham provinces	Humanitarian Response Forum (Govt: NCDM)	September-October	144,000	9,752
31	Philippines	Typhoon Utor (local name: Labuyo)	Luzon island group: Cagayan Valley (region I); Isabela, Central Luzon (region III); Aurora, Metropolitan Manila (national capital region)	Govt: NDRRMC	August	129,000	1,315
32	Pakistan	Floods	Punjab, Baluchistan and Sindh provinces	IFRC: Red Crescent Society of Pakistan	July-September	124,000	675
33	Philippines	Floods: intertropical convergence zone effects	Visayas island group: Western Visayas (region VI) and Central Visayas (region VII); Luzon province: Mimaropa (region IV); Palawan and Mindanao provinces	Govt: NDRRMC	October	124,000	1,257
34	Canada	Alberta floods	Alberta province	Media: Global News (Govt: local authorities)	June-July	120,000	3,425
35	Japan	Typhoon Wipha	Izu Ōshima island, Chiba, Kanagawa and Tokyo prefectures	IFRC (Govt: FDMA)	October	118,000	938
36	Mexico	Hurricanes Ingrid and Manuel	Atlantic and Pacific coast states: Guerrero, Tamaulipas, Puebla, Veracruz, Oaxaca, Colima, Zacatecas	IFRC: Red Cross Society of Mexico	September	118,000	1,003
37	Nigeria	Floods	15 states: Adamawa, Aka Ibom, Bauchi, Bayelsa, Benue, Borno, Cross River, Edo, Gombe, Jigawa, Katsina, Kebbi, River, Taraba and Yobe	Govt: NEMA	July-December	117,000	686

38	Chad	Floods	Mayo-Kebbi Est region, Batha prefecture (Oum Hadjer); Sila (Amdam); Abeche prefecture	IFRC; Islamic Relief Worldwide	August	117,000	9,610
39	Sri Lanka	Tropical cyclone Mahasen	Northern province (Jaffna and Mullaitivu districts); Central province (Kandy and Nuwara Eliya districts); Eastern province (Batticaloa district)	Media: AFP (Govt: DMC)	May	115,000	5,383
40	Vietnam	Typhoon Nari	Central provinces: Da Nang, Quang Nam, Quang Ngai	IFRC: (CCFSC)	mid-October	109,000	1,209
41	Vietnam	Typhoon Wutip	Central provinces: Thanh Hoa, Nghe An, Ha Tinh, Quang Binh, Quang Tri, Thua Thien-Hue	IFRC: (CCFSC)	End September-October	106,000	1,172
42	United States	Colorado floods	Colorado state: Manitou Springs, Boulder, Larimer, Lyons, Logmont and El Paso counties	FEMA, Red Cross Society of the United States, AON Benfield Insurance	September-October	101,000	319
43	South Sudan	Floods	Northern and western states	Media: Voice of America (OCHA)	July-September	100,000	8,963

Note: Text in parentheses indicates the original source cited by the publisher of the information. Only the source(s) selected for the final event estimate are shown. The estimates for most events, especially those of larger scale, drew on multiple sources of information to cross-check before selecting the one that appeared to best represent the most comprehensive and reliable figure for peak displacement.

Acronyms

AFP: Agence France-Presse
CCSFC: Central Committee for Storm and Flood Control
DMC: Disaster Management Centre
FDMA: Fire and Disaster Management Authority
FEMA: Federal Emergency Management Agency
DSWD: Department of Social Welfare and Development
IFRC: International Federation of Red Cross and Red Crescent Societies
IOM: International Organisation for Migration
MCA: Ministry of Civil Affairs
NCDM: National Committee for Disaster Management
NDMA: National Disaster Management Authority
NDRRMC: National Disaster Risk Reduction and Management Council
NEMA: National Emergency Management Authority
NEOC: National Emergency Operations Centre
OCHA: Office of the High Commissioner for the Coordination of Humanitarian Affairs (UN)

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About IDMC


The Internal Displacement Monitoring Centre (IDMC) is the leading source of information and analysis on internal displacement. For the millions of people worldwide displaced within their own country, IDMC plays a unique role as a global monitor and evidence-based advocate to influence policy and action by governments, UN agencies, donors, international organisations and NGOs.

IDMC was established in 1998 at the request of the Interagency Standing Committee on humanitarian assistance. Since then, IDMC's unique global function has been recognised and reiterated in annual UN General Assembly resolutions.

IDMC is part of the Norwegian Refugee Council (NRC), an independent, non-governmental humanitarian organisation.

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