The Duration of Disaster Displacement

A review of the state of knowledge

Author: Bina Desai

Contributor: Fanny Teppe

With special thanks to: Christelle Cazabat, Maria Teresa Espinosa, Sylvain Ponserre, José María Tárraga Habas Editing: Tate & Clayburn

Executive summary

The challenge

- Significant numbers of people are displaced for long periods after a disaster event. Data collection, however, usually ends after a few days or weeks, and so reporting on how many people are still displaced is scarce, resulting in weak estimates.
- Beyond the numbers, information on the demographic characteristics and motivations of displaced people over the longer term is also limited, leading to further uncertainties in reporting.
- Mobility patterns result from a complex interplay between people, their aspirations, resources and capabilities, the environment, and the disaster itself. The duration of displacement is therefore mediated by a set of constrained choices faced by displaced people.

Changing context over time

- How long people are displaced is directly linked to how long it takes to rebuild and repair communities, which
 in turn is associated with the scale of damage, alongside pre-and post-event community conditions, priorities
 and perceptions.
- The weight of each factor is specific to the given context and differs from one individual or household to another. The relative importance of each of these factors also has a temporal dimension.
- Housing damage may be the dominant factor to begin with, but attachment to place, social capital and economic opportunity gain importance over time.
- The longer rebuilding and repair take and the longer people are displaced, the greater the importance of income and livelihoods in decision-making.
- Financial autonomy and access to resources directly affect the recovery phase, but even after communities have rebuilt, these factors shape return and relocation decisions in different ways over time.

Dimensions and proxies

- In the absence of reported numbers, figures on housing damage and destruction represent a useful proxy for displacement and, combined with data on recovery and reconstruction rates, a key indicator for short- and long-term displacement.
- Critical infrastructure damage is another important proxy for both short-term and longer-term displacement, with short-term displacement shaped by disrupted supply of utilities such as drinking water and electricity and longer-term displacement linked to lack of key services such as education and health.



- **Underlying social and economic conditions** continue to be recognised as a key factor for mid- to long-term displacement across all hazard types, regardless of the scale of the disaster.
- Evidence suggests that the longer people are displaced, the less likely they are to return to their areas of
 origin. Employment and income conditions are key factors here, especially as priorities shift from a focus on
 day-to-day survival in the short term to aspirations of better living standards and professional development in
 the mid- to long-term.
- The key demographic factors that determine displacement duration are age, race and ethnicity. Of these, age seems to play the most important role. There is very limited understanding of and no conclusive evidence on how gender shapes duration and patterns of displacement.
- It is vital to understand the intersectional vulnerabilities and capabilities of different population groups, as the interaction of sex and gender with other demographic, social and economic factors creates a complex decision-making landscape that affects displacement duration.
- Tenure status and land or housing ownership play a critical role in displaced people's decisions to return to their area of origin, with renters less likely to return than homeowners, and owners of low-value housing more likely to return than owners of high-value properties. This affects overall recovery trajectories and longterm displacement outcomes.
- Community, social networks and family ties all influence how long people are displaced, and many studies highlight the importance of social capital and attachment to place in long-term recovery. Nonetheless, further analysis of these factors in low-income communities and fragile contexts is needed.
- Access to finance and insurance influence recovery rates and therefore displacement outcomes, with delayed payouts and inadequate insurance coverage prolonging displacement, even in high-income countries. Notably, in a high-income region such as Europe, only a quarter of all losses associated with extreme weather events are covered by insurance; in low-income countries, these rates are much lower.

Advances and remaining gaps

- **Data** remains a key challenge to overcome: it is complicated to extrapolate existing numbers to estimate the total displaced population, but **new sources and methods** are being developed to fill the gaps.
- Proxy indicators and complementary datasets, such as rental and homeownership rates, changes in the demand for utilities and other services, or mobile contracts and usage, should be explored as alternative ways of estimating displacement numbers long after an event.
- Given the important role of income and employment, mapping and quantifying economic opportunities in a certain area before and after an event could also provide a useful data source and indicators for short- vs long-term displacement.
- Governance and the enabling environment, affected by public policy and government capacity, also inform displacement duration, though it is difficult to access data on these specific factors. Proxies could include local government budgets and expenditure pre- and post-disaster, or the number of disaster declarations, where such data exists.
- Geographies and themes are highly imbalanced, with the majority of peer-reviewed studies of post-disaster displacement and rates of return focusing on a select number of countries and hazard types. Importantly, very few examine how long people are displaced.
- Studies that consider physical damage and destruction dominate the field, and little research has been done
 on more complex issues, such as power structures or the role of aspirations in determining displacement
 outcomes.



- It is important to understand the role of communities' and households' demographic composition, displaced people's capabilities and aspirations, their resistance or willingness to move or return, and their sense of control over their displacement more clearly. Distinguishing between factors that relate to household decision-making and those that shape individual agency will also be useful in future studies.
- New approaches to modelling displacement risk and impacts will enhance our understanding of how they shape prolonged displacement. For example, we are likely to get a clearer picture of possible displacement outcomes by integrating individual and household capabilities, employment opportunities, and public policies into risk assessments, while also employing a combination of methods, such as scenario development and agent-based models.
- There tends to be a focus on systematic and quantitative assessments and modelling at the global or regional level, but uncertainties persist. Qualitative data and analysis is also always critical for estimating the duration of displacement in any given context.

Reducing the duration of displacement

- Policies and programmes that seek to reduce prolonged displacement and support durable solutions need to address the underlying and structural factors of displacement risk. Effective poverty and inequality reduction and social protection instruments can prevent poorer displaced groups from falling into unsustainable debt, which prolongs displacement.
- People will flee to save their lives in the short term but will then seek economic opportunities in the mid- to long-term. Therefore, pursuing durable solutions to displacement means considering and meeting individual and collective capabilities and aspirations. In many instances, the duration of displacement may be shaped by economic opportunity rather than economic loss.
- Housing policies, including those regulating rental markets and housing ownership, and land rights are directly linked to the duration of displacement. The explicit inclusion of renters and low-income households in public policy, government regulation and insurance mechanisms would make a big difference in terms of longterm displacement.
- More investment in local government capacity and community organisation is needed to support recovery.
 Local leadership is as important for achieving durable solutions to displacement as it is for any long-term development objective. There are no shortcuts.



1. Purpose and scope of the study

Disaster displacement is a global phenomenon which causes major negative impacts on individuals, local communities, national economies and sustainable development (Quarantelli 1982; Toole 2005; Uscher-Pines 2009; IDMC 2018). Its scale is captured in the annual figures published by the Internal Displacement Monitoring Centre (IDMC) on disaster displacements, a term that encompasses initial and onward movements of people during disaster events.¹ IDMC also publishes estimates on the number of people displaced at the end of each year, but these estimates are highly conservative due to limited data collection and reporting after disaster events. Further information is collected systematically about the demographic and socioeconomic characteristics of displaced populations but understanding of the factors that influence how long people are displaced and of displacement impacts is limited.

This study provides original insights to help address this gap and improve future estimates of the duration of disaster displacement for specific hazards and geographies. It reviews a large body of reporting and analysis by various humanitarian organisations and peer-reviewed studies on displacement, disaster recovery and household decision-making after disasters. This review complements these analyses and goes one step further by focusing on how the role of different factors may change over time and how these factors influence the experience and decision-making of displaced individuals and households during the different phases of displacement.

The findings presented here are based on a global literature review, supported by advanced natural language processing (NLP) techniques to help identify sources not published in English, IDMC data analysis and expert interviews. For more details on the methodology of the review, please see Annex 1.

Life-saving evacuations vs long-term displacement

Pre-emptive and spontaneous evacuations are often triggered by immediate threat to life and associated with shortterm displacement. Evidence is growing, however, that significant numbers of people remain displaced for long periods after pre-emptive and spontaneous evacuations, or else never return to their area of origin (IDMC 2019a; IDMC 2020a).² Therefore, reducing displacement risk should not mean investing less in pre-emptive evacuations, but rather reducing the negative impacts and duration of displacement, in particular protracted displacement (IOM and IDMC 2022; Guadagno and Yonetani 2022). Protracted displacement is often associated with negative impacts on the physical and mental wellbeing of individuals and with socioeconomic decline of households and communities (Paul 2024; Hori and Schafer 2010; Takahashi et al.2016; Zissimopoulos and Karoly 2010; Picou and Marshall 2007; Hamideh et al. 2022; Blaze and Shwalb 2009; Hansel et al. 2013; Loebach and Korinek 2019; Bolin 1985; GNDR 2022).³

Geographical location is usually seen as the main marker of displacement. Return, successful integration into the host community or relocation elsewhere are considered the main indicators of displacement resolution. People may also be considered displaced if they suffer from negative consequences and conditions related to their displacement (United Nations 1998). Still, while this is an important dimension to consider for response and support mechanisms, it is likely that location will continue to be the primary marker of displacement for practical reasons.

³ See also IDMC's socioeconomic survey data: <u>https://www.internal-displacement.org/expert-analysis/evidence-for-action-socioeconomic-survey-data-is-now-available/</u>.



¹ See <u>https://www.internal-displacement.org/monitoring-tools/</u> for details on IDMC data and its monitoring and reporting process.

² The categories of short-, mid- and long-term (or prolonged, protracted) displacement used in this study are chosen to convey that there are different types of displacement in terms of duration. For this purpose, we apply here the following definitions: short-term = 1-30 days, mid-term = 1-12 months, and long-term = more than 1 year. ³ See also LDMC's excloseroprise survey date, https://www.intermet.et/

Data on the duration of disaster displacement and number of IDPs

Systematic data collection on displaced people usually ends days or weeks after a disaster event and therefore does not provide a solid basis for reporting on long-term displacement and planning for durable solutions. Analysis of IDMC data shows that most reporting on internally displaced people (IDPs) occurs shortly after an event and the majority, or 71 per cent, of weather-related displacement events assess the number of IDPs only once: 61 per cent of flood-related displacement events have only one assessment, as do 85 per cent of storm-related events (see figure 1).





Source: IDMC. Note: The x-axis is limited to 31 days (one month) because 96% of flood-related and 98% of storm-related displacement events have a reporting gap within this timeframe.

On average, reporting of IDPs for sudden-onset events like floods and storms lasts less than a week, whereas for slow-onset events like droughts, the reporting period averages 113 days, or nearly four months (see table 1).

Hazard type	Average number of days between the first and last IDP assessment	
Drought	113	
Erosion	14	
Flood	6	
Storm	5	
Extreme temperature	4	
Mass movement	3	
Wildfire	2	
Wave action	0	

Table 1: Average number of days between the first and last assessment of IDPs for weather-related events, 2023–2024

Source: IDMC

This analysis demonstrates that reporting does not equate to the end of displacement or the achievement of durable solutions. Displacement often persists well beyond the final assessment, for both sudden and slow-onset disasters. The conclusion of reporting simply marks the end of data collection, not the resolution of the displacement situation, highlighting the need for continued monitoring to fully capture the long-term impacts on affected populations.

A few exceptions exist, such as in Mozambique and Japan, where data on displaced populations is collected months and even years after the event.⁴ Another example is the Philippines, where there is data on long-term disaster displacement and therefore on how new disasters hit countries where people are still displaced from previous events (see figure 2).

⁴ See Japanese Reconstruction Agency: <u>https://www.reconstruction.go.jp/</u> and Mozambique's National Institute for Disaster Management and Risk Reduction: <u>https://www.facebook.com/INGD.Mocambique</u>.







Source: IDMC 2023.

An analysis of IDMC data on displacement associated with 966 disaster events provides an estimate of average duration of displacement for different hazards (see table 2).

Hazard type	Average duration	Total displaced	Number of events
Drought	236	796,105	15
Dry mass movement	139	327	6
Earthquake	165	2,880,057	20
Erosion	0	1,252	4
Extreme temperature	-	287	1
Flood	20	656,627	339
Multi hazards	166	301,381	42
Storm	185	919,518	145
Volcanic activity	144	13,014	2
Wet mass movement	2	29,808	31
Wildfire	11	103,148	69

Table 2: Weighted average duration of displacement per hazard type

Source: IDMC. Note: Estimates are based on 5,226 data points on the reported number of IDPs staying primarily in evacuation camps for 966 disaster events across 110 countries (majority in Asia) in 2023, using IDMC methodology developed in 2019 (IDMC 2019b). We have excluded events for which housing destruction was used as a proxy and reported numbers of IDPs at the end of 2023.

In the absence of reported numbers, housing damage and destruction are often used as a proxy for displacement. IDMC has developed a methodology to estimate the number of people who are displaced from disasters at the end of each year.⁵ It is based on a combination of reported data, where such figures are provided by governments and other stakeholders, and housing destruction data collected for specific disaster events. The resulting figures are considered highly conservative and are limited by data availability and quality, therefore requiring continuous improvement.

⁵ <u>https://www.internal-displacement.org/monitoring-tools/</u>



Beyond the numbers, information on the demographic characteristics and motivations of those who have been displaced over the long term is still limited (IDMC 2019a; IOM 2024). To address these gaps, rough estimates for displacement rates within certain population groups, such as children, have been developed, usually based on general data on IDPs and national population statistics (IDMC 2024a; UNICEF 2023). IDMC also assesses the severity of displacement situations by using categories that relate to the Inter-Agency Standing Committee (IASC) criteria, which range from safety and security to standards of living, livelihoods and housing, and civic and social rights (IDMC 2024b).

Information on factors that determine the duration of displacement

Most studies published to date analyse factors affecting and triggers of initial displacement, rather than seeking to assess the length of displacement. Where severity and duration of displacement are considered, relevant factors are generally organised into broad physical, institutional and psychosocial categories. These include housing (such as damage, value and ownership, tenure, insurance); household economics (such as income, savings, access to resources, insurance); policy environment and governance (such as response capacities, recovery efforts and resources, land use and housing regulations); financing (such as contingency budgets, regional catastrophe risk insurance and reinsurance, government access to loans and grants); and psychosocial and community dimensions (such as family and relations, attachment to place, social capital and community ties, mental health and trauma) (Dickinson 2013; Scheele et al. 2020). These categories are, in fact, tightly interlinked (Henry 2013).

Recent global literature reviews on disaster displacement analysis and the determinants of household decisions to return identified the scale of damage, pre- and post-event community conditions, the experience of the disaster (including trauma), available resources, attachment to place, risk perceptions and demographics as the most critical factors (Greer et al. 2019; Paul et al. 2024a). Different dimensions become more or less important in decision-making surrounding return after displacement, compared with decision-making regarding whether to leave in the first place. International frameworks also differentiate between physical and institutional factors. For example, the IASC Durable Solutions Framework has eight criteria to determine whether a durable solution, in this case the end of displacement, has been achieved for a displaced person, ranging from access to housing, food and water, education and healthcare, to the availability of employment and livelihoods, to the ability to exercise their rights and participate in public affairs (IASC 2010).



2. Disaster displacement over time: Duration and decisions shape each other

Individual and household decision-making relating to post-disaster return or relocation depends on the context, which is shaped by a range of factors and capabilities. In a recent review of quantitative English-language studies, the most important factors that emerged were housing damage, tenure, neighbourhood damage level and family and relationships (Paul et al. 2024a). Other predominantly qualitative studies and expert interviews suggest that livelihoods, income and social and economic opportunity are the most important factors, particularly when people have been displaced for a long time (Scheele et al. 2020).

Most studies have been conducted in high-income countries – in particular the US – and in the aftermath of large storms and floods. The aftermath of Hurricane Katrina is a particularly well-studied event, for which the duration of displacement has been indirectly explored in research on population returns (Dickinson 2013). Similarly, the 2004 Indian Ocean tsunami has been extensively analysed, with a particular focus on physical factors, such as building damage and loss of utilities due to destroyed infrastructure (Gray et al. 2009). These case studies underscore the predominant focus on immediate physical impacts, while also highlighting gaps in the understanding of long-term displacement dynamics.

Furthermore, recovery policies and the perceived efficacy of government responses play crucial roles in displacement decisions (Scheele et al. 2020; Dickinson 2013). High levels of trust in governmental capacity may facilitate return or relocation, while perceived inadequacies may prolong displacement. Additionally, individual psychological factors, such as trauma from experiencing a violent disaster event as well as the need for closure, significantly influence decisions to return or relocate (Morrice 2013).

A meta-analysis of tens of thousands of relevant documents, supported by NLP, shows how frequently these different dimensions are discussed in relation to displacement and expressed in written sources. Housing damage and destruction are the most predominantly reported factors, underscoring their critical role in disaster displacement decisions (see figure 3).





Source: IDMC.

Disaggregating the occurrence of these dimensions by displacement duration highlights the types or phases of displacement with which they are most frequently associated (see figure 4). Across all dimensions, approximately half of the excerpts are linked to keywords pertaining to short-term displacement. The environmental dimension is particularly striking, with 33 per cent of excerpts in this category relating to long-term displacement. This temporal analysis suggests that certain factors become more salient the longer people are displaced by a disaster.





Figure 4: Occurrence of dimensions in relation to duration of displacement (NLP-supported analysis)

Source: IDMC.

Still, there is considerable variability within these dimensions. For example, while the environmental dimension is predominantly associated with long-term displacement in certain excerpts, analysis of individual terms within this dimension reveal a complex interplay of factors that suggest a more nuanced landscape (see figure 5).





Relative Term Frequencies in the Environment Dimension

Source: IDMC.

The relevance of each of these dimensions, however, is not static but may change over time. Existing literature shows that factors influencing household decisions and experiences of displacement change over the course of the displacement period (Paul et al., 2024; luchi 2023). Whereas the initial flight is usually imposed, in that people have little choice in the matter if they want to continue living (Dash and Gladwin 2007; Thompson et al 2017), the decision to stay in a host community, return to the area of origin or relocate elsewhere is informed by various options, opportunities and capacities, as well as by the conditions of the disaster and post-disaster displacement (Tseng et al. 2024; GNDR 2023).



During the emergency and evacuation phase and its immediate aftermath, physical factors, such as housing damage, dominate decision-making processes; during the recovery and longer-term rehabilitation phases, however, other factors, such as attachment to place or social capital, become much more important (see figure 6).⁶



Figure 6: How different factors influence displacement and decisions to return over time (stylised illustration)

Source: IDMC.

Other factors, such as financial autonomy, are relevant throughout the recovery phase, but they also shape return and relocation decisions in different ways long after communities have rebuilt. They therefore contribute to determining whether people are displaced in the short or long term. The weight of each factor is specific to each context or culture, and even differs from one individual or household to another.

Some studies, however, suggest that, despite diverse regional and disaster contexts, common patterns regarding shortand long-term displacement can be found. Moreover, where differences do exist, they can be explained by common factors, such as housing damage, income or unsanitary conditions (Yabe et al. 2020; Paul et al. forthcoming; Tseng et al. 2024). In a study using mobile data to track post-disaster movements in the US and Japan, common factors were found to be the community's median income, housing damage rates and connectedness to urban centres (Yabe et al. 2020).

After the 2019–2020 Australian bushfires, IDMC, in collaboration with Facebook/Meta, found that long-term displacement could largely be attributed to slow recovery in the affected areas, further hampered by the underinsurance of a large percentage of households. Feeling unsafe, however, was another important factor in return decision-making during the weeks and months after the event (see figure 7).

https://www.undp.org/sites/g/files/zskgke326/files/publications/UNDP_Guidance_Note_Disaster%20Recovery_final.pdf; https://documents1.worldbank.org/curated/en/692141603785003050/pdf/Disaster-Recovery-Framework-Guide.pdf



⁶ Rather than following a specific categorisation of post-disaster relief, recovery and reconstruction, this review is only concerned with their timelines as they relate to the duration of displacement and returns. Therefore, terms such as 'early' or 'immediate', 'mid-term' and 'long-term' are used to describe the different recovery phases. For differing uses of the terms, see for example: <u>https://www.undrr.org/drr-glossary/terminology;</u>

Figure 7: Factors affecting decisions to return in the aftermath of the Australian bushfires, 2019–2020 (response to survey conducted two months after the fires started, Feb–Mar 2020)



Source: Facebook Data for Good, IDMC 2020b.

Having a better understanding of the different factors during the various phases of displacement would help significantly in estimating long-term displacement associated with specific events and modelling its potential impacts.

There is no conclusive evidence that specific hazard types trigger longer-term displacement. Rather, the impact of disasters on livelihoods, including loss of land and degradation of environments, plays a pivotal role in determining the duration of displacement. For example, where economic opportunity is a key factor in IDPs' decisions, damage from major storms or floods to productive sectors such as agriculture, fisheries or tourism can lead to prolonged displacement. By contrast, earthquakes, which primarily cause housing destruction, may result in shorter displacement periods if economic activities remain viable.⁷

The loss of fragile ecosystems through large-scale wildfires can present a significant challenge for recovery efforts (United Nations 2013; Connell et al. 2024). Similarly, droughts have been shown to erode the natural resource base of dependent communities over time and therefore contribute to longer-term displacement, forced changes in seasonal migration patterns and/or permanent relocation (IDMC 2023; Thalheimer et al. 2022; Thalheimer 2023).

⁷ Interview with disaster economist, 19 September 2024.



3. Housing and critical infrastructure damage: Strong proxies for short-term displacement and the emergency phase

During a hazard event, physical safety takes precedence. In principle, people flee to save their lives, regardless of the damage incurred. The intensity and scale of a hazard event are consequently the key determinants of whether people flee in the first place, but it is the severity of its impact on housing, infrastructure and other assets, as well as the severity of the disaster experience on individuals and communities that shapes decisions, capabilities and opportunities for return.

Analysis of housing damage and returns from US Household Pulse Survey data confirms what intuition would suggest: the greater the housing damage, the longer it took for people to return to their homes (see figure 8).

Property damage 14.8% 68.6% 44 2% 72 0% A lot of damage Proportion of households 14.7% 0.8 31.0% Moderate amount of damage Some damage No damage 0.6 28.3% 40.8% 0.4 37.5% 12.4% 22.4% 12 5% 0.2 7.6% 8.3% 13.3% 11.4% 7.1% Less than a week (n=5,055) Less than a month (n=2,481) 0 $O_{ne to six months (n = 1, 363)}$ More than six months (n=886) Not returned (n=1,463)

Figure 8: Housing damage and post-disaster returns, based on US Household Pulse Survey data, 2020–2023

Displacement duration

Source: Nicole Paul, https://hps.nicolepaul.io/, based on US Household Pulse Survey data of 2020–2023.

Severe damage to housing forces people to move, even if the immediate threat to their lives has receded. Housing damage is, therefore, a relatively reliable proxy for displacement estimates in the immediate aftermath of a hazard event (IDMC 2019a; UNDRR 2020; Myers et al. 2008). The number of people in public shelters is often used to assess the number of people displaced by a disaster, but this does not take into account that people may find other forms of temporary shelter, either in family's or neighbours' houses, hotels or rented apartments, depending on the context, social group and financial autonomy of the household. Alternative data sources include mobile location data, such as the optional location tracking of Meta's social media platform Facebook, which can provide information on where people have moved to after large disasters as well as when they return (Giraudy et al. 2021).

Recovery rates, in terms of housing repairs and reconstruction, can also act as a proxy for estimating displacement. It is widely acknowledged that recovery from large-scale disasters is a protracted process, with housing reconstruction taking years, if not decades, resulting in long-term displacement. Examples of this are the 1999 Odisha super cyclone or the 2004 Indian Ocean tsunami (Goyal 2024; Rahmayanti and Rukmana 2024). Nonetheless, other varied factors, including the availability of construction materials, insurance penetration and zoning policies, affect housing recovery – and therefore non-recovery – which adds another layer of complexity, if (non-)recovery is to be used as a proxy for displacement.

Earlier studies that use observational data have shown that housing damage is the key predictor of displacement in the immediate aftermath of a disaster event. A survey of displaced households after Hurricane Andrew hit the south-east of the US in 1992 found that more than half of IDPs had left their homes due to housing damage (Smith and McCarthy 1996). The same study, however, also found that this proportion varied significantly between districts, with the interruption of utilities such as electricity and water acting as the key causes of displacement in other areas in the immediate aftermath of the event. Importantly, where housing damage was the main factor, a lower percentage of the displaced population had been able to return compared with the areas where service disruption had been the key determinant, suggesting that when it comes to estimating return rates, housing damage may remain the best indicator.

A recent attempt at estimating housing recovery rates using a data-driven approach suggests that the most important predictors of whether a household recovers broadly fall into the categories of hazard exposure, rural accessibility and poverty, and reconstruction complexity (Loos et al. 2023). Displacement and solutions to displacement in the mid- to long-term, however, are not just related to housing and return, and other factors come into play.



4. Services, economic activity and reconstruction rates: The enabling environment for an end to displacement in the immediate to mid-term recovery phase

The ways in which post-disaster recovery influences the rate of returns among IDPs are complex, involving many different aspects (Sapat and Esnard 2016). Recovery processes and decisions to return are shaped by a range of factors, which may be grouped into distinct yet connected categories and measured by different indicators (see figure 9; Shaw 2014; Cambridge Centre for Risk Studies and AXA XL 2020; Paul et al. 2024a). In addition, the length and trajectory of the recovery process itself result in large part from how much public attention is paid to the disaster, which influences the level of local, national and international support. When smaller to mid-size disasters – and even some large-scale ones – do not mobilise extensive financial and technical resources, IDPs must fend for themselves, and therefore remain dispersed and displaced for longer.⁸ As such, humanitarian response budgets could, in certain contexts, be analysed as a proxy for longer-term displacement.





Source: IDMC

Beyond reconstruction of housing, repairs to damaged **critical infrastructure** must be a key priority, as this damage results in the disruption of utilities and other essential services. Previously, the extent to which service disruption contributes to short-term or prolonged displacement was not well understood (IDMC 2019a), but assessing the extent of damage to critical infrastructure and how it translates into service disruption has become a focus of new modelling efforts (Mühlhofer et al. 2024; CDRI 2023). For example, the International Centre for Environmental Monitoring (CIMA) Research Foundation, in partnership with IDMC, has developed a new model that seeks to incorporate infrastructure damage and utility disruption into displacement risk models (Rossi et al. 2024). Notably, in Nepal, disruption to electricity supply after the 2015 earthquake was found to be the principle factor deterring people from returning (Abuhamdia 2018); meanwhile, after wildfires in the US, functioning critical infrastructure contributed to early returns, despite large-scale housing damage (Sharygin 2021).

⁸ Interview UNDP staff, 29 October 2024.



Meanwhile, the importance of recovering livelihoods and sources of income is mentioned in all studies on disaster displacement. Much of the analysis, however, is surprisingly surface level, with little exploration of how the search for income and employment opportunities directly shapes displacement patterns and duration. Livelihood recovery more broadly has been shown to be linked to housing, health and wellbeing, and an enabling environment, right from the immediate post-disaster phase to long-term recovery (Pu et al. 2021). For example, after Hurricane Katrina, homeowners ostensibly based their decisions about return and relocation in large part on housing, but it has been suggested that these decisions were also considered in relation to other factors, including employment (Henry 2013).

The loss of **livelihood and employment** is often the main burden faced by displaced households, and therefore **recovering income** becomes an early priority (IDMC 2019b). Over time, however, priorities shift, with individuals' focus on day-to-day survival slowly turning to aspiration, as they seek not only to recover pre-disaster income but also access new opportunities, such as professional development or expansion of their livelihood base in the mid- to long-term (Mucherera and Spiegel 2022; Shakyar et al. 2022; Bello et al. 2024; IDMC 2022b). Loss of income and lack of access to employment in IDPs' areas of origin can therefore be a strong predictor of delayed returns and protracted displacement, just as employment opportunities elsewhere may indicate a higher likelihood of relocation.⁹ The effect of constrained employment and income opportunities on displacement may only be established months after the disaster event (Lynham et al. 2017).

For example, in the months after severe floods in Nigeria in 2022, there was considerable movement to urban areas; at the time, this was not connected to the aftermath of the event, which had damaged housing and land, but researchers now understand this as a delayed effect of the disaster – in fact, it could be considered delayed disaster displacement.¹⁰ Equally, long-term displacement of various members of a household can also be linked to loss of income rather than physical damage: working members of the family will often stay in destination areas with access to employment while the rest of the family returns home after a disaster event.

Tenure status and land or housing ownership are also key factors in determining recovery trajectories and longterm displacement outcomes (Fitzpatrick et al. 2016). In turn, they are largely determined by socioeconomic characteristics and play an important role in shaping long-term displacement patterns (see section on risk modelling below). Above all, homeownership is an important predictor of return vs relocation (Cong et al. 2017, Paul et al. 2024a; IDMC 2020b). While a severe event causes high levels of damage across the board, resulting in fewer differences between homeowners and renters, at least in the first instance, in cases where destruction is moderate or not total, homeowners are more likely to return and therefore less likely to experience either long-term displacement or permanent relocation (Cong et al. 2017).

Access to finance and insurance plays a critical role in the recovery process too. The rate of reconstruction for both housing and infrastructure assets is directly linked to insurance coverage on the horizontal scale (geographic coverage and numbers of households insured) as well as vertical (the value insured) (You and Kousky, 2024; Climate Council 2023), housing grants (ODI and RMS 2017; Gergory 2017). In high-income countries, where insurance coverage is greater, timely payouts can enable quicker recovery. Conversely, delayed payouts or underinsurance can prolong displacement, as was seen after the "Black Summer" bushfire season in Australia in 2019–2020, where home insurance was found to play a key role in either enabling or hindering returns (IDMC 2020b). While coverage is relatively high across Australia, up to 80 per cent of affected homeowners were underinsured and so reconstruction costs were much higher than insurance payouts (Ibid).

Payouts from a public insurance programme in New Zealand after weather-related events were shown to facilitate recovery, to the extent that the areas that experienced property damage were no worse off than those that suffered no property damage (Owen et al. 2021). Yet, even in high-income countries, such as in Europe, only a quarter of all losses associated with extreme weather events are covered by insurance (Addactis 2023). In lower-income countries, insurance rates are much lower, and so microinsurance can greatly affect outcomes at the individual household level, as do catastrophe risk-pooling mechanisms at the national and regional levels (You and Kousky, 2024).

Finally, **food insecurity** can become an indirect barrier to returns, particularly in low-income countries and communities (IDMC 2023; Nozhati et al. 2019; Ahmad and Afzal 2021; Armah et al. 2010). In such contexts, assessing the damage to livelihood assets, such as agricultural land, livestock or fishing grounds. can act as a proxy for the likelihood that IDPs will return.

¹⁰ Interview with World Bank staff, 1 November 2024.



⁹ Interview with disaster economist, 19 September 2024.

5. Protracted displacement: Factors that hinder return, relocation or integration into host communities

Reconstruction of housing and infrastructure, community recovery and individual financial autonomy are key determinants when it comes to IDPs' decisions to return, which equates to an end to displacement. Other factors may also constrain choices as well as open up new possibilities for solutions in host communities or elsewhere. Previous research has established, interestingly, that the longer recovery takes and the longer people are displaced, the more income and livelihoods matter (Henry 2013, Tseng et al. 2024). The spectre of better jobs, access to education and healthcare, more active public life and possibly higher levels of independence, particularly for young people, women and members of the LGTBIQ+ community, will all contribute to decision-making, as IDPs may seek to turn displacement into an opportunity. Therefore, there is a suggestion that the longer people are displaced, the less likely they are to return to their areas of origin (Smith and McCarthy 1996).

Underlying social and economic conditions continue to be recognised as a key factor for mid- to long-term displacement across all hazard types, regardless of the scale of the disaster event (Vestby et al. 2024; IDMC 2018; Daly et al., 2023; Hallegatte et al. 2020). They predetermine exposure or vulnerability to disaster events, and therefore contribute not only to whether someone is forced to flee but also to when and why they may return or not. As things stand, however, scientific attempts at mapping and modelling these dynamics have been limited. These attempts have also been hampered by the complexity of the factors at play, which makes it impossible to use aggregate measures to represent all households within a region and across population groups (Hamideh et al. 2021; Peacock et al. 2018).

Pre-existing social and economic conditions also shape the outcomes of post-disaster reconstruction, particularly if prioritisation and resource distribution reinforce inequalities (Bohnet et al. 2021). Similarly, recovery investments in fragile contexts, which are not sensitive to pre-existing tensions, can contribute to intercommunity conflict, further prolonging displacement (Peters and Ben Bih 2023).

Building on this, the pre-existing **socioeconomic and demographic characteristics of a household** may be considered among the most critical factors in determining long-term displacement outcomes (IOM 2024; Gray et al. 2009; Dickinson 2013; Paul et al. 2024a). The income level of populations affected by disaster displacement differ widely across regions, and yet globally, the average, per capita income of those affected by disaster displacement is significantly lower than the income of the general population. There are also important regional differences in income (see figure 10).



Figure 10: Average income of populations in areas affected by weather-related internal displacement

Source: IOM 2024.

Demography shapes displacement patterns too, with some studies suggesting that certain characteristics determine mobility and immobility, if not duration per se. Of the demographic characteristics, age seems to play the most important role (IOM 2024; Cong and Liang 2023; Abeldano Zunia and Critttenden Nance, 2018; Cong and Feng 2021; Molinsky et al. 2022). Therefore, knowing which age groups are most affected by or at risk of disaster displacement, depending on the type of hazard, can contribute to producing accurate estimates for displacement outcomes. For example, there



is a significant difference in the age of population groups affected by disaster displacement in Europe vs in Africa, with a high proportion of young males and children affected by displacement in the context of drought in Africa, while bushfires, for example, primarily affect older population groups in the Americas and Europe (figure 11).





Source: IOM 2024.

Gender has also been shown to influence disaster displacement in general, but there are almost no studies that analyse how it specifically shapes displacement duration. Some evidence suggests that men are more likely to return earlier after a disaster event, but the evidence is not conclusive (IDMC and ADB 2022). Recent assessments, however, confirm that the interaction of sex and gender with other demographic, social and economic factors creates a complex decision-making context that affects displacement duration, and so understanding the intersectional vulnerabilities and capabilities of different genders is vital (IDMC 2019c; IOM 2024; Peek et al. 2006).

Housing policies and plans, including those regulating tenure status, ownership of property, access to land and overall land use, influence the scale and geographies of long-term displacement by enabling or hindering durable solutions, regardless of whether people decide to return, relocate or integrate into destination areas (Saraf et al., 2018; GFDRR no date). In this regard, regulations and government performance vis-à-vis existing policies, alongside people's perceptions of regulations and government performance, play an important role (Kim and Oh 2013; Dickinson 2013).

Access to land, supported by transparent systems and documented **land rights**, is another critical area that determines when and whether people find an end to their displacement after a disaster event, mirroring patterns seen in conflict settings. Land disputes, lack of documentation and resulting difficulties in laying claim to property can hinder IDPs' abilities to return or settle elsewhere (Mitchell et al. 2021). In this context, "land grabbing" – the appropriation of land by public or private actors with vested interests – can result in protracted and even permanent displacement for those unable to reclaim their rightful ownership or access (Wright et al. 2021; Rienow et al. 2022).

Finally, much has been written about the key role that **social capital and attachment to place** play in recovery and also in people's decisions to stay, leave, move elsewhere or return (Aldrich 2011; Meyer and Aldrich 2015; Lee et al. 2017; Aldrich 2012;).11 Examples from different contexts, such as the Dominican Republic after Hurricane David and the US after Hurricane Katrina, as well as nationally representative data from regular surveys across 14 years in Indonesia show that there is no simple link between housing damage or destruction and mobility. Rather, community, identity and place massively affect people's decisions, and post-disaster contexts are highly culturally conditioned (Belcher and Bates 1983; Cutter 2011; Tse 2011; Dickinson 2013). Notably, after the 1995 Kobe earthquake in Japan, many people decided to remain in place despite diminished economic opportunities, whereas, after Hurricane Katrina, lower levels of attachment to place meant that there was more movement post-disaster, with more people choosing to relocate.¹² Also, where attachment to place is strongly correlated with community identity and large parts of the community have been displaced, return may not be a viable option and permanent relocation may be preferred (Swapan and Sadeque 2021).

¹² Interview with academic expert, 12 November 2024.



¹¹ For definitions of attachment to place see Scannell and Gifford 2010.

6. Tangible vs intangible determinants of displacement duration: Two spotlights

More than a decade of displacement: Typhoon Haiyan

Typhoon Haiyan was one of the most powerful typhoons recorded: it made landfall in the Philippines on 8 November 2013 and affected over 14 million people. Around 4.5 million people were displaced from their homes, and nearly six million found themselves in evacuation centres. Millions of survivors lost their homes, with many subsequently fleeing to cities.

Given the sheer scale of the disaster, overall recovery was slow. A displacement assessment conducted six months after the event showed that more than two million people were still without adequate housing (DSWD et al. 2014). Even one year later, many were still seeking shelter, food, water and income opportunities, and displaced residents reported that they wanted to return and rebuild their homes, infrastructure and livelihoods, but had been unable to do so (Eadie 2019, Makhoul 2014; DSWD et al. 2014). Today, more than a decade later, thousands are still displaced.¹³

Shortly after the disaster, most of the people affected by the disaster returned to the area, even if their houses had been destroyed (IDMC 2013; Sherwood et al. 2015). This shows there is a complex and non-linear relationship between housing and returns, and that people weigh up different concerns, including health and safety, property, income, community and care responsibilities. The case of Haiyan also confirms that there can be a wide gap between return or relocation and the "end of displacement": people affected by the disaster event continued to experience challenges related to displacement, alongside the trauma of the event itself. In fact, according to recovery assessments performed between one to three years after the event, most respondents felt that their lives had not yet returned to "normal" (Sherwood et al. 2015).

During the immediate post-disaster phase, spontaneous and organised evacuation centres provided immediate refuge to IDPs. Many people, however, then returned to damaged houses, or else moved to host families and makeshift shelters closer to home, and so many households were still experiencing a sort of displacement in informal living conditions. One of the few systematic, longitudinal studies that exists on disaster IDPs and relocation, which was conducted over eight years from 2013 to 2020, shows that the priorities of IDPs change over time, mirroring findings from other contexts (luchi 2023). While residents were primarily concerned with physical safety in the immediate aftermath of the event, they soon became preoccupied with re-establishing livelihoods, services and social networks.

Importantly, people's decisions to either return or relocate were directly shaped by government regulations triggered by Haiyan, such as local zoning regulations. For example, in 2014, "no-build, no-dwelling zone" regulation was put in place for the coastal areas of Tacloban city and large parts of the Eastern Visayas region, meaning people were not allowed to return and rebuild in zones that were designated high-risk areas. To begin with, enforcement was slow and protests by local populations were also widespread;¹⁴ however, any remaining housing in these no-dwelling zones was in fact demolished from August 2019, and so returning to these areas ceased to be an – even theoretical – option (luchi 2023). No-build zones had previously been established after earlier disasters, such as Typhoon Washi (also known as Typhoon Sendong) in Mindanao in 2011. This too resulted in many IDPs remaining displaced for longer than expected (DSWD et al. 2014).

The relocation and resettlement of displaced populations whose homes had been in high-risk areas became a key policy response after Typhoon Haiyan. In the severely affected Tacloban city, which lies in Eastern Visayas, approximately 40 per cent of the population was permanently relocated from coastal areas to higher ground ten miles toward the north: this was a central pillar of the local government's rehabilitation plans (Tran et al. 2023).

Unfortunately, construction of relocation sites took several years, due to challenges with regard to land acquisition and financing, with most residents moving into their new homes more than three years after the disaster (Ibid; Ye 2020; Aroyo and Astrand 2019). Residents were relatively satisfied with the physical aspects of housing, but problems emerged regarding access to jobs, land and basic services (Tuhkanen et al. 2018; Ensor et al. 2021). Lack of clarity surrounding the residents' housing rights –whether they owned the properties or had tenure – also became an important

https://www.rappler.com/newsbreak/investigative/super-typhoon-yolanda-housing-projects-unfinished-thousands-unoccupieddecade-later-2023/; https://th.boell.org/en/2023/11/13/decade-after-typhoon-haiyan; https://asia.nikkei.com/Economy/Naturaldisasters/Philippines-searches-for-answers-10-years-after-Typhoon-Haiyan

https://www.thenewhumanitarian.org/news/2014/07/18/no-build-zones-confusion-delays-resettlement-haiyan-survivors;



¹³ See news articles and institutional communication on the anniversary in 2023, for example:

¹⁴ See for example, <u>https://www.philstar.com/nation/2014/02/07/1287674/group-stages-fluvial-protest-vs-no-build-zone-policy;</u> <u>https://www.bulatlat.com/2014/02/18/denr-urged-to-remove-no-build-zone-markers-in-eastern-visayas;</u>

issue, with less than half of respondents to a survey conducted in 2020 having official deeds on their houses. This meant former IDPs still did not feel secure in their new homes (Tran et al. 2023).

In many ways, long-term displacement in the aftermath of Typhoon Haiyan can be seen as a "logical extension" of preexisting land insecurity, both in terms of risk and impact (Ibid). Tenure insecurity and lack of official documentation regarding property and usage rights resulted in higher physical risk (Curato et al 2018). Moreover, many already experienced difficulties accessing adequate and affordable housing before Haiyan; these difficulties only increased in the post-disaster recovery period (Bradley et al. 2016). This problem is not specific to post-Haiyan recovery, but it has been a key reason for prolonged displacement previously, including after Typhoon Washi (NRC 2014).

Therefore, while Typhoon Haiyan's scale, intensity and impact triggered large-scale, short-term displacement in the Philippines, the slow and flawed resettlement process, continued insecurity surrounding tenure and property rights, and limited access to income and services all shaped – and prolonged – widespread displacement. Finally, the community's limited involvement in decision-making around housing location, housing size and structural characteristics, as well as community development in relocation sites, meant that the recovery phase was marked by several unplanned outcomes, contributing to the sense that a durable solution to displacement has not yet been achieved (Aroyo, 2019).

Today, the Philippines is one of the very few countries where displacement data is collected months and even years after a disaster event. After Typhoons Rai (Odette) and Megi (Agaton), which happened consecutively in late 2021 and early 2022, respectively, systematic monitoring of IDPs' movements, including returns, allowed for a better assessment of displacement patterns and duration (IDMC 2023). Post-Rai, it took the vast majority of IDPs on average 15 weeks to return to their homes (Ibid). When Typhoon Megi hit a few months later, however, an estimated 40 per cent of the returnees were forced to flee again, and those still displaced were faced with additional challenges prolonging their displacement (Ibid).

The key factors determining how long IDPs' were displaced in the aftermath of Haiyan were: pre-existing social and human capital, including political capability; financial assets and resources at the household level; and access to recovery financing at the local and national levels (Ensor et al. 2021; World Bank 2024; CISL 2019; World Bank 2017; Santos et al. 2016). The data from Haiyan also tallies with limited information gleaned from other contexts, such as Cyclone Idai in Mozambique or Cyclone Harold in the Pacific: that is, after major events, significant mid- to long-term displacement is to be expected (Government of Vanuatu et al. 2020).



Chronic flood risk and long-term displacement in Pakistan

A combination of extreme rainfall, glacial melt, landslides, and riverine, urban and flash flooding devastated large parts of Pakistan from June to August 2022. Nineteen of the 25 poorest districts were affected, more than 1,700 people died, a third of whom were children, and nearly eight million people were displaced (Government of Pakistan 2022a). With over 2.3 million homes damaged or destroyed and critical infrastructure inundated, the scale of the crisis overwhelmed the response capacities of both the government and humanitarian agencies (Government of Pakistan 2022b). Weeks after the emergency declaration, nearly 70 per cent of IDPs were still without adequate shelter, reflecting significant limitations in immediate relief efforts and the complexities of disaster response at this scale. Preliminary estimates suggested that the floods would increase the national poverty rate by up to four percentage points, equivalent to an additional nine million people in poverty (Ibid). The sheer scale of the event meant that recovery and an end to the large-scale displacement would take time (see figure 12).



Figure 12: Damage and loss assessments from the 2022 floods in Pakistan

Source: Government of Pakistan 2022a

The dispersal of IDPs across the company further complicated relief efforts, with fewer than eight per cent of those in need residing in formal camps. The majority of IDPs sought refuge along roadsides, on embankments or with relatives, beyond the reach of organised assistance (IOM 2022). Sindh and Balochistan – host to 90 per cent of the displaced population – continued to cite shelter as the primary unmet need well into October 2022, indicating persistent deficiencies in both temporary and transitional housing provisions. More than one million individuals were still displaced as of December 2023, illustrating how long displacement can last following disasters of this magnitude.

Heavy monsoon rains in the same regions in 2024 compounded these challenges, with the risk of re-displacing individuals who had yet to attain stability following the 2022 floods (IDMC no date). Recurrence of hazard events in already affected and vulnerable rural regions is a common feature of Pakistan, and the resulting food insecurity forces families to leave their homes repeatedly (Ahmad and Afzal 2021).

Notably, there were major floods in July 2010 that severely affected populations in small cities, villages and rural areas, but there was also significant variation between provinces: in Khyber Pakhtunkhwa and Punjab, the vast majority of IDPs were reported to have returned home by the end of the year, but nearly 85 per cent of IDPs were still displaced in Sindh province (Dixon and Schaffer 2010). In Sindh, the challenges of rebuilding services and rehabilitating agricultural land were particularly significant too, as public services were already fragile and under-resourced before the event and access to land in some areas was limited due to conflict and insurgencies (Ibid). There have been many attempts to document rural to urban displacement in the immediate aftermath of disaster events, as well as migration to cities years after major events (Crisp et al. 2012; Castells Quintana et al. 2022). Often, land disputes can arise in the aftermath of disasters, since landmarks and official documentation have been lost, contributing to challenges for displaced households to return (Dixon and Shaffer 2010).

Demographics and socioeconomic characteristics of households also play a key role in determining displacement duration, as landless sharecroppers are directly affected by lower productivity and decreasing labour requirements after



disaster events (Salik et al. 2021). While landowners tend to move back and forth between their place of displacement (or migration) and home village, facilitated by access to financial and human resources and driven by the motivation to protect their property and maintain political influence, landless labourers and their families may not find ways to return, and so are more likely to be displaced for longer periods or permanently relocate (Ibid).

As such, the combined impact of major floods in Pakistan over the past few decades have once again shown that predisaster income, assets (including savings, land and other property) and political influence determine displacement outcomes for households after disaster events. The Pakistan example also confirms that, in many cases, the longer a household has been displaced – especially to urban areas with better access to services and opportunities, in particular education – the less likely it is to return to its area of origin (Salik et al. 2021).

The country has also always experienced significant urban-to-urban onward movement, with regular reports of repeated disaster displacement and city-to-city migration, as people seek employment and opportunities (Jamal and Ashraf 2011). Droughts and heat stress have played a role in shaping rural long-term migration patterns too, in a similar way to other contexts with high dependence on natural resources and pre-existing structural vulnerability (Mueller et al. 2014; Jamshed et al. 2020). Recent attribution studies and disaster risk assessments show that the risk of future displacement associated with floods, as well as heat stress and drought, is likely to increase with climate change (Zachariah et al. 2023; Otto et al. 2023). Added to this, future climate change scenarios suggest that displacement duration may well be further prolonged by increased damage and losses, together with the erosion of the resilience and asset base of communities that are dependent on natural resources. Living and working conditions in high-risk areas may become untenable (Thalheimer et al. 2021).



7. Towards estimating the duration of disaster displacement: Lessons for data collection, analysis and future research

Over the past few years, researchers have made significant advances to overcome existing data limitations, setting the agenda for future research and innovation. New approaches to modelling displacement risk and impacts are starting to contribute to an enhanced understanding of the role different factors play in determining initial flight, as well as prolonged displacement. Whether we want to estimate the average length of displacement associated with a specific hazard in a particular country, or whether we wish to model the risk of long-term displacement, the following considerations provide a basis on which to build.

Data

Limited reporting on displaced populations in the aftermath of disasters and throughout the different recovery phases is a key challenge. There is a lack of granular socioeconomic data that is also linked to geolocated assets, such as houses or critical infrastructure: this severely limits the explanatory power of geospatial analysis for displacement. New techniques have been developed to overcome this challenge, such as progress in microsimulation techniques, aided by new algorithms and computational capacities, and increasing accessibility of microdata from household surveys and census data.

Still, it would be useful to have more accurate data on areas that have been affected directly and indirectly by a disaster event, including housing damage and population movements, at several points in time after the event (Smith and McCarthy 1996; IDMC 2019a).

To date, estimates of the number of displaced people at a given point in time are usually derived from one or more of the following:

- evacuation and shelter reporting by governments and humanitarian agencies, media and research teams
- housing destruction records or modelled estimates, multiplied by household size (IDMC 2019a)
- household surveys, usually with a sample of households that habitually resided in an affected area, to understand the proportion that is still displaced, was ever evacuated or ever sought public shelter (Kolbe et al. 2010)
- manual counting and estimation of movements, based on bus, car or ship movements out of affected areas (for example in Haiti, Bengtsson et al. 2011)
- mobile location data-based estimates, such as social media data, call records or GPS location data (Yabe et al. 2022; Newell et al. 2012)¹⁵
- estimates based on the demand for utilities, food items and other essential products, or market activity, which can all potentially act as proxies for rates of return (Tseng et al. 2024)

In most of the cases above, validating and extrapolating the data to reach an estimate for the total displaced population is complicated, not least due to differences in data collection and methods of analysis. We need to develop further sources and methods for estimating population numbers, such as comparing population numbers from census data before an event with numbers one or two years after an event by employing remote sensing. Assessing changes in the demand for utilities and other services or mobile contracts and usage may be another way of estimating displacement numbers long after an event.

Additionally, given the important role income and employment play in displacement outcomes, mapping and quantifying economic opportunities in a certain area before and after an event could also provide new sets of indicators for shortvs long-term displacement. To take into consideration governance and the enabling environment provided by public policy and government capacity, we could use proxies such as local government budgets and pre-disaster expenditure, where such data exists (Capuno et al. 2024). Finally, where data on homeownership vs rental rates and housing value is available, this could represent another useful data source, as research has shown that tenure status and the value of housing for property owners shapes mobility decisions after disasters (Seong et al. 2021).

It is also important to continue addressing the challenge of limited granular demographic and economic data via microsimulation techniques, enabled by larger computational capacities and new algorithms, as well as increasing willingness of governments and international agencies to release census and survey microdata for research (Rubinyi

¹⁵ See also the following for a real-time application during disaster response: <u>https://www.flowminder.org/what-we-do/population-</u> <u>distribution-and-mobility-analysis/disaster-management/the-first-use-of-mobile-operator-data-for-humanitarian-operations-haiti-</u> <u>earthquake-2010</u>



et al. 2022). Synthetic datasets could significantly contribute to disaster risk and displacement modelling, but to date, these approaches have only been applied in a limited capacity in these domains.

Geographical and thematic scope of future research

The majority of studies on post-disaster displacement and returns, beyond those published by IDMC or UN organisations, focus on a select number of countries and hazard types. Much attention has been given to major storms and wildfires in the US and to post-tsunami Japan over the past decade, alongside post-earthquake recovery in Nepal and – to some extent – multiple hazards in Central America. There have been very few studies on the long-term patterns and duration of displacement in African disaster contexts or the Middle East. In a review of English-language literature on households' decisions to return after disasters, almost 70 per cent of studies reviewed were conducted in the US (Greer et al. 2019; see also Weber and Peek 2012).

By contrast – and perhaps unsurprisingly – the bulk of relevant reports and documentation on post-disaster recovery and displacement published by international development actors and humanitarian agencies is concentrated on major disasters in low- and middle-income countries (figure 13).



Figure 13: Publications mentioning different types of disaster displacement

Source: IDMC.

Very few studies explicitly analyse the duration of displacement, focusing instead either on the scale of initial displacement, or decisions around return or relocation, without considering temporal factors, such as how long it takes for those decisions to be made, which factors influence the time it takes to make them and how these factors may change over time. To consider household decision-making on a large scale, granular survey data is required, which is rarely available. An example of a useful data source in this regard is the US Household Pulse Survey, which generates a range of data on socioeconomic changes at the household level, in reaction to specific country-wide events, such as disasters or global phenomena like the COVID-19 pandemic. Recent analysis of its data shows how such surveys can be used to better understand displacement duration (figure 14).





Source: Nicole Paul, https://hps.nicolepaul.io/, based on US Household Pulse Survey data of 2020–2023.



Thematically, most studies consider physical damage and destruction above other outcomes, and comparatively little research has been done on more complex issues, such as power structures (Tuhkanen 2023) or communication about recovery and resilience (Su and Tanyag 2019). One reason for this is that the latter are notoriously difficult to quantify and therefore do not lend themselves easily to quantitative assessments and modelling exercises. Qualitative data is, however, always an important part of analysis displacement duration. Studies on rental housing after major disasters, wellbeing and social justice in disasters can all provide relevant qualitative information and context for future research.

Modelling displacement risk and long-term displacement

New disaster recovery models are beginning to take into account household displacement – in fact, several new approaches to modelling displacement risk have emerged in the past few years. In general, one can distinguish between:

- approaches that seek to estimate displacement risk for future events vs those that analyse past events
- model-based vs data-driven approaches
- approaches that focus on housing recovery, household recovery and household return, respectively

As such, several of the more recent approaches explicitly aim to go beyond housing destruction as the sole indicator for initial displacement, while others seek to distinguish specifically between short- and long-term displacement (Paul et al. 2024b; Sheele et al. 2020; Tseng et al. 2024; Rossi et al. 2024).

Several models produce highly localised and specific quantitative displacement outcomes for different scenarios. One example is a model for post-tsunami displacement in Christchurch, New Zealand, which produced such specific results that it could estimate the number of individual residents displaced by day, with 14,695 residents to be displaced initially, 9,014 on day four after the event, 7,131 on day seven and 4,366 after one month (Sheele et al. 2020).

Meanwhile, random parameter models seek to incorporate differences into recovery decision-making processes that may be unobserved and assess their potential societal or economic impact. A recent study that used this approach to relate disaster impacts on households to demographic and socioeconomic variables found that certain demographic characteristics, such as race, gender and household size, were "fixed effects" that played a key role in determining displacement impacts (Hu et al. 2021).

There are, however, persistent uncertainties and key gaps throughout the disaster risk modelling process. New research is seeking to make these uncertainties more transparent and quantify them (Kropf et al. 2022; Meiler et al., 2023), undertake model validation and review across different contexts (Paul et al., 2024), or incorporate rental housing rather than just property ownership (Mongold et al. 2024).

Previous models usually ignored the differentiated levels of access to recovery financing for different population groups, which, as has been shown, is a key determinant of recovery trajectories. Therefore, several new approaches are now using agent-based financing models for post-earthquake housing recovery to overcome such disparities (Alishjabanaa et al. 2022). Similarly, agent-based post-disaster decision-making models are being applied to hypothetical disasters, with the aim of estimating how many people would require shelter and how many could be expected to relocate permanently (Costa et al. 2020). These models have also been applied to fragile contexts (Panizza et al. 2024).

A particularly promising approach to modelling household decision-making in the aftermath of disasters has been developed at ETH Zurich (Tseng and Stojadinovic 2024). It applies Amartya Sen's human capabilities framework and Maslow's hierarchy of needs to household decision-making surrounding displacement and post-disaster recovery (figure 15). By relating different capabilities and needs to the technical functions provided by the built environment, such as physical safety from housing, this approach can estimate mobility patterns based on changes in capabilities that occur or develop in the post-disaster and recovery context (figure 16).





Figure 15: Matching different levels of needs and corresponding capabilities

Source: Tseng and Stojadinovic 2024.

Figure 16: Coping mechanism based on capabilities and feedback loops between coping strategies and context



Source: Tseng and Stojadinovic 2024.

As a combination of scenarios and models, this approach takes into account individual capabilities as well as group effects on these capabilities, and can model changes in capabilities over time, as the recovery process evolves.

Another approach to post-disaster displacement modelling, focused on the experience of vulnerable households and populations, approaches housing and household recovery as a process, illustrated as a "predictive Markov Chain model" (see figure 17; Sutley and Hamideh 2020). This approach moves beyond the typical post-disaster recovery stages and outcomes, which are themselves based on Quarantelli's widely used four housing types (1982), and demonstrates that pre-existing social and economic vulnerability and challenging post-disaster contexts often mean that temporary and permanent solutions cut across and merge several of the housing stages and types. Significantly for this study, this model shows how higher social vulnerability results in a higher number of housing recovery stages – that is, delays to finding solutions to lost permanent housing and therefore a longer displacement duration (lbid).





Figure 17: Stages of housing recovery, including failure of recovery

Approaches such as the ones presented by Paul and colleagues, Tseng and Stojadinovich, and Sutley and Hamideh present new and promising avenues for strengthening both the analysis of vulnerability in disaster displacement risk modelling and future estimates of displacement duration. For the latter, rental status, low income, large household size, low educational attainment and physical immobility have emerged as predictors for delayed return or permanent relocation or displacement (Paul et al. forthcoming). In fact, tenure status and income level were important across *all* households, while educational attainment scored highly for large households and those with a physically immobile member. Based on such findings, data on population changes, rental vacancy and homeownership rates, number of disaster declarations and unemployment rates could be important sources and potential indicators for displacement outcomes.¹⁶

Finally, extreme event attribution (EEA) studies have made large strides in the past years and may contribute to further research on disaster displacement duration in the context of climate change, when combined with some of the approaches mentioned above. Combining evolving disaster displacement risk models with EEA would not only provide evidence of the link between anthropogenic climate change and displacement, but also insights into potential increases in long-term displacement and the need for permanent relocation in high-risk areas (Thalheimer and Otto 2021).

¹⁶ Interview with academic expert, 11 September 2024.



Source: Sutley and Hamideh 2020, p.5.

8. Epilogue: Reducing long-term displacement risk

This review focused on the factors that determine how long people are displaced and possible avenues for quantifying and better understanding long-term displacement. Beyond providing answers to these issues, however, the findings from the review also present useful reminders of what is required to achieve durable solutions for those displaced in and after disasters.

Pre-existing socioeconomic and demographic factors have been shown to play a critical role in determining displacement outcomes, highlighting once again that underlying factors of risk creation are not being adequately addressed (Lavell and Gamarra 2024). Also, the fact that people will flee to save their lives but then move towards opportunities means that displacement length and patterns are directly linked to individual and collective capabilities and aspirations. In many instances, the duration or end of displacement after a disaster is influenced by economic opportunity rather than economic loss (Belcher and Bates 1983). This means that, on the one hand, decisions are shaped by pre-existing conditions, but on the other, they are highly influenced by post-disaster motivations and the conditions in IDPs' new destinations. These factors are currently not reflected in responses to disaster displacement, including in the way IDPs are supported.

Research from different country contexts across the globe has shown that IDPs' resistance vs willingness to move or return must be better understood (Dickinson 2013; Oliver-Smith 1982; Raju 2013). Once initial displacement has occurred, households' perceptions of the move – as either a necessity or choice – and of their (im)mobility are just as important to consider as are their asset base or demographic background.

In this light, it is critical to distinguish between household and individual agency in the decision-making process, and yet this is underexplored. Many studies of displacement and returns mix households and individuals as units of analysis, whereas a better understanding of the different household members' priorities, vulnerabilities and aspirations would enable more targeted support.

One critical finding of direct relevance to disaster displacement-related policies is the importance of housing status. Here, public policy and government regulation, public and private insurance, and associations of homeowners and estate agents all have a role to play. In most cases, regulations, financial support and access to insurance are better defined for homeowners than for renters, with direct implications for how long affected households are displaced after a disaster. In fact, those without regulated rental agreements are most at risk of longer-term displacement (figure 18).



Figure 18: Proportion and length of household disaster displacement in relation to housing tenure in the United States

Source: Nicole Paul, https://hps.nicolepaul.io/, based on US Household Pulse Survey data, 2020-2023

Many relevant regulations and support mechanisms exclude renters all together or have stringent requirements when it comes to proving rental status or homeownership: this may exclude vulnerable households from accessing recovery aid, especially minority groups (Sutley and Hamideh 2020). As a result, explicitly including such households and status holders in policies concerning disaster risk reduction, response and recovery would go a long way in achieving solutions to long-term disaster displacement (Ibid; Taheri Tafti and Tomlinson 2015). Added to this, regulations that reign in



foreclosures or insurance cancellations after disasters and that incentivise reuse of abandoned properties, together with other measures to dampen housing market volatility pre- and post-disasters, can contribute to limiting protracted displacement on a large scale (Zhang and Peacock 2009).

Many studies highlight the need to invest in local leadership, including local government capacity, community engagement and community-based approaches, to accelerate recovery and allow for the displaced to return or settle elsewhere (GNDR 2023; Flynn 2011; Chamlee-Wright et al., 2017; Brookings and IOM 2015). This is particularly pertinent for voluntary relocation programmes post-disaster, which have to become more consciously shaped by communities and transparent (Badri et al. 2006; Refugees International 2010; UN-HABITAT 2010; Taheri Tafti and Tomlinson 2015).

Last, but certainly not least, a vast body of evidence exits on the high "poverty penalty" that vulnerable households face during and long after disasters (Abrahamson et al 2015; Hallegatte et al. 2020; Hallegatte et al. 2016; UNDRR 2015). Poorer population groups can quickly fall into "debt traps" after major disaster events, which in turn may significantly prolong displacement (Vinke 2022; Salik et al. 2021). In Bangladesh, for example, displaced populations from low-income communities struggled to establish themselves in destination areas, taking on debt that then prevented them from returning to their areas of origin, where the environmental impacts of the disaster, such as salinisation and generally degraded soil quality, hindered agricultural production (Vinke 2022).

A range of instruments are available to counter these processes, including a suite of social protection instruments, the provision of microloans and financial counselling post-disaster, as well as support for regulated private financing and collective mechanisms (Desai et al. 2023; Vinke 2022; Deryugina et al. 2018). Ultimately, this means investing significantly in the reduction of poverty and inequality, targeting post-disaster support to vulnerable groups and tackling the underlying drivers of disaster displacement risk. Following the objectives and targets of Sustainable Development Goal 1: No Poverty may therefore be our most valuable pathway in mitigating long-term disaster displacement.



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Annex 1: Methodology

This study has been developed based on a systematic literature review, displacement data analysis and expert interviews.

Literature review and NLP

We conducted a global literature review, including relevant academic publications, IDMC's significant body of work and relevant publications by other international and national organisations. A particular effort was made to review recent peer-reviewed publications, with a focus on articles and books that specifically mention disaster displacement and that have been published in the past five years, so as to gain a better understanding of recent advances on the topic. The analysis of these recent studies was combined with a review of broader literature on disaster management and recovery dating back to the 1980s, alongside analysis of databases and disaster risk models that relate to displacement. Thereby, we made sure we had a broad overview of literature, data and models in which displacement and the duration of displacement may have been considered.



The literature review was further supported by advanced NLP techniques to identify the largest possible number of publications and datasets of relevance to the study. An initial, desk-based literature review provided the basis for identifying key terms for the taxonomy and framework deployed by the AI-supported literature search.

Data analysis

We undertook an analysis of IDMC data, developing estimates for average displacement duration for different hazards. These estimates could be significantly improved in the future. For example, IDMC has systematically gathered global data on housing destruction caused by disasters. This information not only serves as a proxy when movement-related data is unavailable but also plays a pivotal role in comprehending the duration of displacement. For instance, Cyclone Amphan prompted approximately 2.5 million pre-emptive evacuations in Bangladesh in 2020. While many evacuees were able to return promptly, housing destruction data indicates a substantial number of individuals will face prolonged displacement, as IDMC documented over 22,000 instances of housing destruction or severe damage. This therefore warrants further in-depth analysis.

Spotlights

We analysed two specific disaster displacement events to complement the global overview and unpack the influence of different factors on displacement outcomes associated with particular hazards and in specific locations. These spotlights highlight the importance of local context but also identify commonalities with other disaster situations, as presented by the literature.

Expert interviews

The literature review and analysis were complemented by ten interviews with experts from international organisations and development banks, relevant university departments and think tanks, who verified findings from the literature review, provided additional insights for the discussion presented here and helped identify the spotlight examples.

