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Forecasting displacement and solutions for decision-making in volatile contexts: a case study from Ukraine

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Abstract

Following the large-scale Russian invasion in February 2022, policymakers and humanitarian actors urgently sought to anticipate displacement flows within Ukraine. However, existing internal displacement data systems had not been adapted to contexts as dynamic as a full-fledged war marked by uneven trigger events. A year and a half later, policymakers and practitioners continue to seek forecasts, needing to anticipate how many internally displaced persons (IDPs) can be expected to return to their areas of origin and how many will choose to stay and seek a durable solution in their place of displacement. This article presents a case study of an anticipatory approach deployed by the International Organization for Migration (IOM) Mission in Ukraine since March 2022, delivering nationwide displacement figures less than 3 weeks following the invasion alongside near real-time data on mobility intentions as well as key data anticipating the timing, direction, and volume of future flows and needs related to IDP return and (re)integration. The authors review pre-existing mobility forecasting approaches, then discuss practical experiences with mobility prediction applications in the Ukraine response using the Ukraine General Population Survey (GPS), including in program and policy design related to facilitating durable solutions to displacement. The authors focus on the usability and ethics of the approach, already considered for replication in other displacement contexts.

Policy Significance Statement

The article demonstrates the application and use of a mobility forecasting in the context of the ongoing war in Ukraine. Anticipation of future displacement flows and, eventually, planning for integration or return of those displaced enables policymakers and practitioners to make evidence-based decisions on response to and resolution of the displacement crisis. Anticipatory analysis enables proactive rather than reactive approach to programming and governance of migration and displacement, unlocking the opportunity for more effective and impactful prepositioning, planning, and resource allocation in view of improving the situation of crisis-affected populations. The article provides concrete examples of forecast applications to programming and policy in the Ukraine context and lays out the preconditions necessary for unlocking its full benefits for decision-making.

1. Introduction

Following the large-scale Russian invasion of Ukraine in 2022, policymakers and humanitarian actors urgently sought to anticipate displacement flows within and out of Ukraine. Available mobility

forecasting models were not adapted to contexts as dynamic and fluid as the full-fledged war, however. A much simpler tool came to the rescue, fit for purpose and holding a promise for global displacement data in its ability to map rapidly evolving crises as well as in its capacity to anticipate durable solutions to displacement.

2. Standard mobility forecasting approaches

Forward-looking displacement analysis for policy and programming has fascinated the humanitarian and development field for the last decade. Data models and predictions of ongoing and future migration and displacement are flourishing. However, it has been difficult to find a model that actually predicts future movements and destinations with high accuracy and low margin of error, even more so in the complex and fluid internal displacement settings typical for active conflicts.

Forward-looking approaches differ in the type of movement they forecast, the data inputs required, and the way results may be used. No one method is intrinsically superior to all others. Broadly speaking, forward-looking approaches can be categorized into early warning, forecast and foresights. early warning systems rely on quantitative and qualitative data to monitor possible drivers and population movements to generate short-term estimates. Foresights are methods particularly qualified to look at medium to long-term, macro-level issues and how they affect migration, reliant on expert judgments and resulting in horizon scanning or future scenarios. Forecasts can be of two types: model-based forecasts that are statistical approaches predicting the future based on past data and complex econometrics or time-series models and survey-based forecasts that are surveys conducted with individuals, households, or experts that hold forward-looking elements such as questions on movement intentions or capacities for future movements (Table 1).

A number of research teams have recently succeeded in forecast human mobility utilizing advanced machine learning and artificial intelligence tools. These efforts, however, typically rely on a strong evidence base or focus on regular, cross-border mobility which is systematically recorded through existing immigration or asylum systems.

In this vein, modeling efforts related to mobility have, to the knowledge of the authors, largely focused on global patterns—predicting cross-border flows over long-time horizons and the observation of patterns in contexts of diverse international push and pull factors. Barker and Bijak (2020) comprehensively review the pre-2020 approaches from a macroeconomic perspective, while Carammia et al. (2022) present some of the latest and most advanced work in this direction, successfully producing an early warning system and forecast model of asylum flows into the European Union. The work of Boss et al. (2022) also focuses on international refugee flows, while Abel and Cohen (2022) demonstrate the efficacy of diverse modelling approaches on gendered international migration flows. Another outstanding model is presented

Table 1. *Characteristics of three common forward-looking approaches to anticipate future migration (taken from GMDAC, Forecasting the future of migration (migrationdataportal.org)*

	Forecasts	Foresight	Early warning systems
Time horizon	Variable	Medium to Long-term	Short-term
Tangible results	Yes	No	Yes
Quantifies uncertainty	Yes	No	Partly[a]
Relies on numerical data	Yes	No	Partly
Relies on experts	No	Yes	Partly
Feasibility	Low to medium	High	Medium

[a]GMDAC (2020) indicates that early warning systems are typically not capable of quantifying uncertainty. Since the publication of their paper, however, promising early warning work by Carammia et al. (2022) and others has shown some capacity in this regard. The original table has been modified to indicate this progress.

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by Nair et al. (2020), forecasting mixed migration flows from Ethiopia to six destination countries over a 7-year period with error margins in the low thousands per year. Of particular relevance to this case study is also the work of Minora et al. (2023), assessing the potential of the Facebook Social Connectedness Index (SCI) to predict cross-border displacement of Ukrainian nationals into the European Union. While the authors do show that the SCI can serve as a real-time proxy for diaspora presence, its aptitude for forecasting future flows remains to be tested. These latest research efforts[1] have indeed demonstrated some success in predicting future flows but are yet to be applied meaningfully at the operational level in a fluid environment or tackle internal displacement movements, typically less documented compared to cross-border migration.

A handful of authors have recently demonstrated the application of novel data science approaches in the narrower sphere of internal displacement forecasting (e.g., Oishi, 2022 or the Jetson Project, 2019). As also concluded by Qi (2023), however, artificial intelligence or machine learning approaches to modeling or forecasting forced migration continue to suffer from dependency on time-series migration data. Without historical records, the accuracy of forecasts tends to be limited, and operational application in rapid-onset emergencies is unlikely. Nair et al. (2023) did deploy machine learning methodologies in service of humanitarian objectives to generate internal displacement futures across a variety of countries. Despite the intent of operational application, however, the use of historical data still limits their model's efficacy in rapid-onset crises, as in cases where data availability is limited, the system deploys a basket of data from other countries of operation to produce what the authors title "best-effort" forecasts.

In the fast-evolving Ukrainian context, characterized by rapid internal displacements, producing a mobility prediction has been a challenging yet operationally necessary exercise. A better understanding of the volumes of displacement (how many?), origins (where from?), profiles (who?), needs (what?), and destinations (where to?) was essential to tailor planning and response. A forward-looking analysis of mobility in a sudden-onset emergency can support first responders in prepositioning aid along the displacement routes and in the main points of transfer/arrival. It can also support States in planning for longer-term recovery and durable solutions programming.

However, the lack of rapidly updated population and location data following the start of the crisis and the difficulty of accessing areas and populations often obstructed accurate and relevant predictions. Early warning systems are typically not well adapted to forward-looking displacement analysis given the difficult access to data and locations. Foresights offer an interesting qualitative alternative but often take time and struggle to produce quantitative estimates, and model-based forecasts cannot keep up with rapidly evolving contexts. With the right data collection methods, a strong sampling approach (see below section), and correct extrapolations, the simplest survey-based forecasting approach proved best fit for rapid mobility predictions and accurate estimates of population volumes, profiles, and intentions, allowing potential forward-looking interpretations, even during times of active war.

3. Practical experiences with making mobility predictions in the Ukraine response

The computer-assisted telephone interview (CATI) random-dial survey had not been a novelty in Ukraine, where 89% (State Statistics Service of Ukraine, 2020) of adults operate a cell phone and network coverage spans the full width of the country's vast territory (except that not under control of the Government of Ukraine). Pollsters and research agencies in the country have for years relied on extrapolations from representative samples collected routinely across a broad range of topics—from consumer surveys to public opinion polls.

As tensions mounted in the first days of 2022, humanitarian agencies in the country began identifying resources for prepositioning of humanitarian goods in the event of violence escalation.

[1] Another group of authors explore the use of gravitational models in predicting future migration flows (see, e.g., Abel (2022), Zellmann and Cuaresmaa (2025), or Qi (2023)). The utility of these approaches has been questioned, however—see Beyer et al. (2022).

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How much to prepare depended in large part on understanding how many would leave their homes under a variety of scenarios. How many would flee and be in need of immediate aid in case of increased shelling along the former contact line? How many would consider leaving their homes if the frontline shifted westward, and how many of those would need assistance at transit points? Wishing to improve the rough preparedness estimates based on known displacement patterns from between 2014 and 2017, International Organization for Migration (IOM) followed up with what was known to work in Ukraine —yet another remote, representative phone survey (Krelinova et al. 2023). Given the practical difficulties and costs associated with conducting representative sampling across borders, the survey's scope remained internal to Ukraine, intending to serve operational response within the country—justified as the majority of forced displacement movements related to the Russian invasion of Ukraine took place within Ukraine's borders.

3.1. Before the storm: evidence for preparedness

In late January 2022, IOM conducted a rapid anticipatory survey to estimate potential displacement flows by way of measuring the population's conflict perceptions and mobility intentions in case of escalation (representative at *oblast* [region] level in key the *oblasts* [regions] of interest). The results showed that in case of severe conflict escalation, one-third of the 41 million nation would consider leaving their homes, with populations in border *oblasts* in the East (Kharkiv, Donetsk), South (Zaporizhzhia, Odesa), and in Kyiv city more likely to move than others. Among all respondents, 13.6% nationwide expressed they might leave their homes and go to another place within Ukraine. Both these figures—close to 12 million and 6 million people, respectively—accurately predicted the scale and horror of displacement seen in Ukraine that coming spring.[2]

3.2. Monitoring displacement in a volatile context

Once active hostilities began forcibly displacing thousands of people from and within the Northern and Eastern regions as well as from the city of Kyiv, few reliable sources were available to describe or estimate the full scale of displacement in Ukraine. In the initial days and weeks of the war, as millions of people struggled to make it west amidst fuel shortages and train stations filled with crowds desperate to fit on to overfilled carriages, phone coverage remained broad and stable.

One week following the invasion, IOM deployed another survey to estimate internal displacement flows as they unfolded, and by mid-March, the first estimates were published, indicating 6.5 million people internally displaced (IOM, 2022a).[3] The survey showed that the majority of internally displaced persons (IDPs) fled places of origin in the East macro-region and in the city of Kyiv, findings fully aligned with the scenario-based forecasts obtained a month prior.

Twice a month, for the first 3 months of the war, the General Population Survey provided updated and representative data on population location, displacement status, and key needs (Figure 1).

The survey enabled estimation of the total IDP stocks, including those who registered as IDPs with the state bodies of Ukraine and those who did not but who were de facto displaced (in line with the International Recommendations on Internally Displaced Persons Statistics, see OCHA, 1998; EGRISS, 2020), as well as population groups' demographic profiles, vulnerabilities, and a spectrum of needs over time. Quickly, the study became a key reference point informing humanitarian response planning in Ukraine, including to highlighting and monitoring the remaining gap between de facto displacement and displacement registrations.

Implementing any survey at a time of active war whose significant impacts span the entire territory of a country does translate into a series of key limitations which must be considered when interpreting results,

[2] According to the IOM, in March 2022, 6.5 million people were displaced in Ukraine, whereas UNHCR recorded about 5 million displaced outside Ukraine by the end of 2022 (UNHCR), a total of nearly 11.5 million newly displaced population.

[3] The General Population Survey is implemented in cooperation with Multicultural Insights. See IOM, Ukraine Displacement Report, March 16, 2022.

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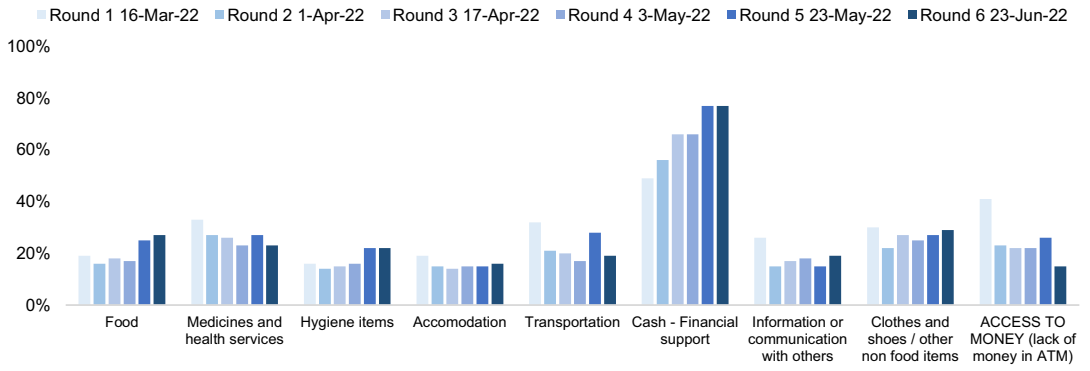

Figure 1. *The IDP needs evolution from March to June 2022 (the peak of the emergency and gradual stabilization).*

however. Among the key challenges is dependence on cell and power networks, but fundamentally also the lack of up-to-date population statistics in Ukraine:

1. Measures were put in place to strengthen the **reliability of the random-dial respondent selection** in the face of frequent but temporary power outages and network coverage issues in areas close and beyond the shifting the frontline, such as placing multiple calls to all numbers unreachable at first try (see UN Data Forum, 2022). Nevertheless, it is possible that residents of areas with high infrastructure damage or areas beyond the frontline may have a lower representation, and readers must assume a certain degree of underreporting on the severity of needs, despite the already alarmingly high needs reported.
2. The General Population Survey relied on the **best available baseline population figures** at the time of each round. These informed the development of the national sample design and extrapolated representative findings to the population, introducing limitations to the final estimates. At a time of the large-scale invasion, the latest available official population statistics comprised the 2001 census and subsequent estimate-based assessments by the State Statistics Service of Ukraine, with a planned 2023 census postponed indefinitely due to the martial law (The New Voice of Ukraine, 2023).[4] Cognizant of the limitations of continued reliance on a population baseline unadjusted for large-scale mobility following February 2022, IOM contributed to efforts by the United Nations Population Fund in Ukraine to develop, for operational purposes of humanitarian agencies, a new Common Operational Dataset on Population Statistics (COD-PS), which would reflect on the basis of best available data on births, deaths, as well as recent displacement and mobility, the post-invasion population distribution and stock in Ukraine. In July 2023, the United Nations Population Fund updated their estimate of the total population baseline figure in Ukraine,[5] and IOM began extrapolating the General Population Survey findings to this—now best available—baseline without further delay. Throughout the implementation of the General Population Survey, IOM has maintained methodological transparency and emphasized the inherent limitation to population estimates, even if based on the most reliable data source available at the time of analysis to produce the de facto displaced and returnees' population stock estimates. Despite their limitations, IOM

[4] According to the State Statistical Services of Ukraine (SSSU), as of January 2022, the census 2001 baseline population figure was 41 million people, excluding the territories of the Crimean Peninsula and Sevastopol City (State Statistics Service of Ukraine, *Number of Present Population of Ukraine, as of January 1, 2022*).

[5] The 2023 COD-PS for Ukraine was made available only to key humanitarian actors on a need-to-access basis due to the sensitivity of estimates of granular population presence during an ongoing war, as well as due to continued consultations with the Government of Ukraine.

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continued presenting population estimates alongside survey results. This has been key to enabling practitioners and policymakers to more easily grasp and translate findings into operational plans and policy, mindful of the margins of error.

3.3 Planning ahead—delivering data for durable solutions

The General Population Survey responded to demands for both short-term and long-term anticipatory analysis by including modules on immediate mobility intentions as well as, increasingly, modules focused on IDP needs and plans with regard to durable solutions to their displacement (IASC, 2010). Both types of intention data enable the preparation and planning for contingencies and underpin the long-term recovery preparations by key national and non-governmental stakeholders.

Immediate mobility intentions were routinely assessed in each round of the survey, including among those who had not previously gone into displacement, as well as among IDPs, whose aptitude for relocation or immediate return was tracked alongside push and pull factors, and among returnees, whose intention to stay or re-displace was monitored. The evidence collected at times defied humanitarian intuition and served to inform key response decision-making. Most notably, when in October 2022, the Russian Federation launched an intensive air raid campaign targeting Ukraine's energy facilities with the stated aim of provoking further displacement and exodus from key affected regions, an extended mobility intentions module incorporated in the survey showed that even very disruptive triggers (e.g., a complete power cut for a prolonged, undetermined period of time) would not sway the majority (65%) of the population from their determination to stay (IOM, 2022c). At the same time, the module highlighted the specific geographic and demographic characteristics which increased some Ukrainian households' vulnerability to mobility triggers and the likelihood that they may be displaced under the future scenarios tested.

The immediate mobility intentions survey results also showed a clear division line between those who stayed and those who had already been displaced: if a Ukrainian household has not gone into displacement yet, the likelihood they would go into displacement in the future is very low unless a very significant unforeseen trigger event occurs. At present, only 2% of the general population who has not experienced displacement since February 2022 are considering relocation, compared to 22% of those currently in displacement (IOM, 2023c).

Seeking to quantify future durable solutions caseloads, the General Population Survey has tracked durable solutions plans among surveyed IDPs since July 2022 (Round 7), when 13% of the then estimated 6.6 million displaced indicated the plan to integrate in their current location in the long term (translating into an estimated integration caseload of 864,000 IDPs nationwide, with IDPs in Kyiv city most likely to stay, compared to IDPs in other locations) (IOM, 2022b). Interestingly, the share of IDPs intending to integrate has been increasing as time went by—in January 2023 (Round 12) (IOM, 2023a), the local integration caseload nationwide was estimated at 589,000 (11%) IDPs, while in September 2023 it was 675,000 (18%) (IOM, 2023c).

In producing estimates, the survey approach mirrored the latest developments in thinking about durable solutions to internal displacement at the global level. The UN Secretary General's Action Agenda on Internal Displacement and associated workstreams had indeed inspired remote representative surveys in a field typically dominated by key informant-based location assessments. In particular, the Data for Solutions to Internal Displacement (DSID) framework that is being piloted across 15 priority countries explicitly calls on actors to gather data to estimate *solutions pathway caseloads*, indicating the number of IDPs who are (based on individual choice) on a path towards one of the spectrum of durable solutions: local integration, return, or resettlement. The CATI, where context permits, lends itself easily to such a task.

As a result, response actors in Ukraine now understand the scope of the integration caseload, with disaggregation available across geography and household characteristics. Among other program development insights, thanks to this data, we now understand that older IDPs (60+) and displaced in Donetska, Zakarpatska, Cherkaska, and Chernivetska *oblasts* are significantly less likely than others to plan to

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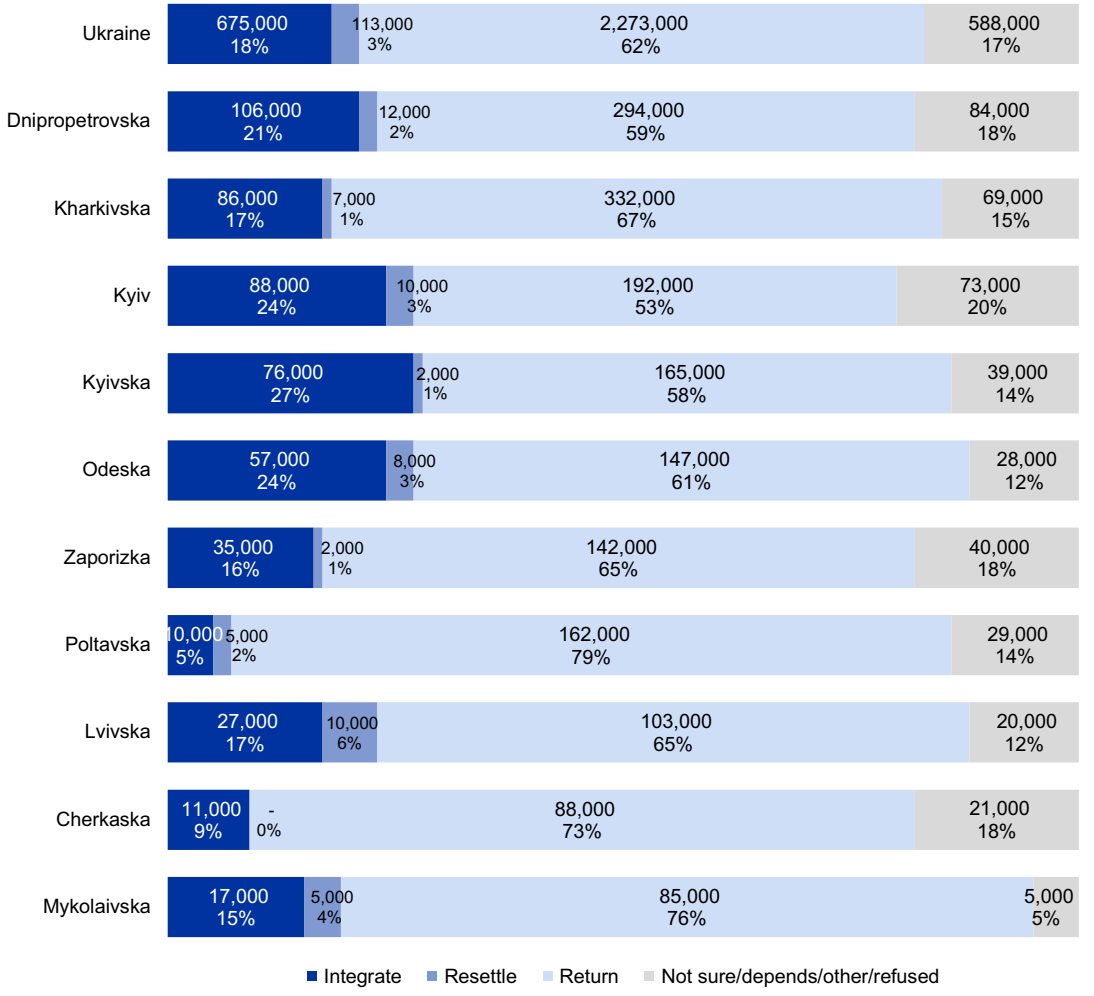

Figure 2. *Durable solutions preferences as long-term mobility intentions of IDPs in the top 10 oblasts of displacement and nationwide.*[6]

integrate locally (IOM, 2023c), indicating the need for strengthening interventions focusing especially on these groups to facilitate a solution to displacement among the women and elderly who may have no place to return to, despite their wish to do so (Figure 2).

4. From data to evidence-based planning

Forward-looking estimates and analysis have always been in high demand among key stakeholders. The nuances and sensitivities of the forecasts, however, still necessitate the deployment of data protocols and efforts to prevent misuse, harm, and misinterpretation and support evidence-based decision-making to ultimately address displacement and support durable solutions in Ukraine. This section outlines the uses and applications as well as key ethical concerns and lessons learned with regard to supporting

[6] Presentation of survey findings included both highly representative shares in the population as well as extrapolated population size estimates, which, while affected by some methodological limitations, are easier to comprehend and utilize for programmatic decision-making by a non-technical audience.

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policymakers and practitioners in building on the insights gained through the forward-looking analysis delivered by the General Population Survey in Ukraine. Particular focus is dedicated to the need for conceptual harmonization as a precondition for evidence-based planning in the sphere of durable solutions to displacement.

4.1 The ethics and limitations of mobility forecasting

Methodological innovation (though, in the case of the CATI, teaching an old dog a trick in a new field) is essential to ensure that increasingly cost-effective strategies are applied while minimizing the survey burden on vulnerable respondents. If deployed to forecast displacement, however, representative surveys deliver data of extreme sensitivity, and their poor handling would pose a serious risk to not only respondents themselves but also to the larger segments of society they are representative of. Mobility forecasting presents ethical challenges and limitations that should be outlined upfront in any similar exercises.

As outlined in "The Good and Bad of Anticipating Migration" (Marcucci and Verhulst, 2023), the challenges of using anticipatory methods in migration policy can be categorized as conceptual and implementation challenges:

1. **Conceptual challenges** encompass issues such as algorithmic bias, where predictions may perpetuate existing bias and inequality, potentially leading to discriminatory policies. Uncertainty is another challenge, as the accuracy of anticipatory methods can vary due to data availability and unpredictable changes in migration drivers. Self-fulfilling prophecies and the politicization of predictions are additional concerns, as they can shape the future and be exploited for political purposes. Specifically for the case of the General Population Survey conducted in Ukraine, highlighting current and future vulnerabilities and propensity for future population movements can easily be used against the well-being and interest of the targeted population.
2. **Implementation challenges** include the often-limited data availability and quality, data gaps, inconsistencies, and biases that can limit the reliability of predictions. For the example of the General Population Survey in Ukraine, extrapolating results from the random-dial survey relies on strong and up-to-date population baselines. Population baseline being unavailable or rarely updated in many locations, this methodology might be challenging to implement in specific contexts.

In the context of Ukraine, trigger-based mobility forecasting data produced through the General Population Survey was never published. Its sharing among actors ensuring response preparedness followed a strict confidentiality protocol in order to minimize the risk of intentional or inadvertent misuse. If replicated in additional displacement contexts, mobility forecasting data produced through the representative survey approach must be subject to a sensitivity classification system based on the severity and likelihood of potential harm that may materialize as a result of exposure, in line with established practices of data responsibility in humanitarian action, especially the IASC Guidance on Data in Humanitarian Action (IASC, 2023) and the OCHA Data Responsibility Guidelines (OCHA, 2021). In the future, privacy-enhancing techniques (PETs) could be explored to enhance the security of individual-level data while enabling the development of meaningful outputs from the General Population Survey datasets by independent researchers (see, e.g., recent efforts by the UN Statistical Commission within the UN-CEBD PETs Lab).

4.2 Data uptake of mobility forecasts by policymakers and practitioners

Once cognizant of its sensitivities and limitations, practitioners and policymakers can benefit significantly from forward-looking mobility analysis in volatile contexts. Anticipatory analysis enables proactive rather than reactive approach to programming and governance of migration and displacement (see also Verhulst and Marcucci, 2023), unlocking the opportunity for more effective and impactful prepositioning,

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planning, and resource allocation and limiting the need for reliance on "no regrets" aid allocation approaches common in many sudden-onset emergencies.

The Ukraine case study demonstrates several good practices in the uptake of mobility forecasts for evidence-based decision-making both at the early stages of crisis as well as in the transition towards recovery. At the same time, the absence of joint language and trusted definitions presents a key barrier to fully harvesting the benefits of mobility forecasts.

Among others, the below key opportunities for mobility forecasting have materialized in Ukraine, demonstrating the benefits of applying similar approaches in comparable displacement contexts:

1. **Advocacy and resource mobilization for humanitarian aid:** Within the first 6 months following the large-scale invasion by the Russian Federation to Ukraine, data on the scale of displacement within and outside of Ukraine became an effective tool for advocacy and large-scale fundraising for international humanitarian assistance on the part of both the UN and partners as well as by the Government of Ukraine itself. Demonstrating the need for continued attention to the displacement crisis, forward-looking data points (e.g., immediate mobility intentions among different segments of the population from the General Population Survey) enabled practitioners to foreshadow the anticipated growth of flows and, eventually, stabilization of very high displacement rates in the country, informing resource-mobilization decisions accordingly within frameworks such as the UN Flash Appeal for 2022, Humanitarian Response Plan for 2023 (United Nations, 2022; OCHA, 2023), and others.
2. **Social protection caseload planning:** In contexts with robust structures of governance, large share of support received by IDP households is distributed through traditional systems of social protection, in the case of Ukraine managed by the Ministry of Social Policy of the Government of Ukraine. In fact, we know that 22% of all IDP households in Ukraine rely on the State IDP livelihood allowance as a primary source of income for covering the costs of essential needs (IOM, 2023b), alongside employment and other sources of income. In this context, forward-looking analysis anticipating volumes of displacement has been deployed in support of the fiscal planning of the Government of Ukraine, facilitating and contributing to the understanding of future social protection caseloads in the country and their levels of vulnerability and needs. Similarly, given the large redistribution of population presence across the geography of Ukraine, the Government of Ukraine has been eager to analyze current and future pressures on institutions responsible for facilitating programs of social protection at the local level.
3. **Return intentions for recovery:** While the number of Ukrainians displaced within as well as outside Ukraine remains high, nearly half of all who have gone into displacement since February 2022 have already returned to their places of habitual residence (IOM, 2023c). The question of volume and timing of returns rises in prominence in particular in the context of discussions on socio-economic recovery, with Ukrainian government and international assistance actors highlighting the importance of the return of a skilled workforce and market revitalization. Forecasting the return of internally displaced populations to particular areas of origin as well as related needs for reintegration, on the other hand, enables local recovery planning, especially for local authorities who have been granted key responsibilities for decision-making on recovery priorities within their territories as part of the ongoing process of decentralization. While essential for planning, caution must be applied in forecasting returns due to the lack of established legal definition or status for returnees in the Ukrainian legislation (see below).

To reap the benefits offered by mobility forecasting in the above and other areas, however, practitioners and policymakers ought to build on a clear conceptual understanding of the issues and actions being forecast. In the case of displacement forecasting, it is essential that eventual data consumers have a shared understanding of the definitions of the key groups whose actions are being forecast (e.g., IDPs, returnees) and of the markers of the actions and intentions subject to the analysis (integration, reintegration, return, etc.).

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Despite the availability of several global frameworks on displacement, concerted efforts to develop a joint, context-informed framework of understanding are required in Ukraine to unlock the full benefits of forecasting methodologies for programming and policy in this thematic area. Referencing the UN Secretary-General's Action Agenda on Internal Displacement (United Nations, 2022), the International Recommendations on IDP statistics (IRIS), the IASC Framework on Durable Solutions, and even the very recent proposal of the interagency Data on Solutions to International Displacement (DSID) Task Force finalized in the summer of 2023, practitioners and policymakers remain faced with unresolved questions about the application of theoretical frameworks in practice.

As outlined by Simojoki (2023), the IASC framework does not provide an authoritative answer on when durable solutions criteria have been met and an individual can be considered (re)integrated, for example. The IRIS recommendations, as well as the DSID proposal, on the other hand, suggest determining the achievement of a durable solution by comparison to the resident non-displaced population, a proposition faced with well-justified opposition in the Ukrainian context, as resident populations are often themselves severely impacted by the ongoing war and require assistance to meet basic needs.

Thus, to facilitate the full use of the mobility forecasting approach presented in this article, as well as any other forecasting approaches in the context of the displacement crisis in Ukraine, it has been necessary to engage in a broad consultative process to define relevant concepts in the Ukrainian data landscape (ReliefWeb 2023). These and other challenges in applying global standards and frameworks have necessitated the setup of a Ukraine-specific workstream focused on developing a joint analytical framework on durable solutions, which, under IOM's leadership, will be able to deliver the clarity and harmonization necessary for unlocking the full benefits of engaging in forward-looking analytical efforts, including the forecasting of returns, integration, and other elements of mobility (RCO and IOM, 2023). Without such harmonization, mobility forecasts would be plagued by the lack of interoperability, decreasing trust, and willingness of practitioners and policymakers to turn to evidence at key decision-making moments.

5. Conclusions: so what?

The remote representative survey approach to anticipate, monitor, and forecast displacement patterns during an active war proved particularly well suited to the Ukrainian context. The survey approach has a broader potential, especially in other internal displacement settings where basic preconditions are met, most notably in countries such as Afghanistan, Armenia, Bangladesh, Colombia, Iraq, Libya, Nigeria, the Philippines or even Yemen—all characterized by high mobile phone penetration rates and experiencing significant internal displacement.[7]

Despite challenges in applying global frameworks on displacement within models requiring high degrees of conceptual clarity and harmonization, representative surveys could prove particularly useful in broadening the traditional assessments toolbox by delivering data for the future of displacement, which are hard to attain through traditional KI-based approaches. Ultimately, however, the survey-based forecast technique will rely on the availability of clear conceptual frameworks enabling joint understanding of key concepts and elements that are subject to prediction. Building on a joint understanding of terms between technical experts and policymakers, forecasting approaches may unlock a wealth of opportunity for evidence-based planning and for solutions to displacement in volatile contexts.

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[7] Other displacement contexts such as Chad, Ethiopia, or Mozambique would be less suited to a CATI approach due to lower levels of cellphone penetration.

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Data availability statement. Due to the sensitive nature of data collected within the General Population Survey in Ukraine, IOM does not make related datasets public, as they could be misused and their sharing could lead to harm if unrestricted. Anonymized datasets or their parts, as well as metadata are, however, available to humanitarian partners and researchers affiliated with trusted institutions on the basis of justified need, including for replication of research. Any requests for data should be made to dtmukraine@iom.int, including a detailed description of intended use and further sharing, as well as noting the requestor's familiarity with the Data Sensitivity Classification and related information-sharing protocols published by the United Nations Office for Coordination of Humanitarian Affairs (OCHA) in Ukraine.

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Competing interest. The authors declare none.

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