

Methodological Framework used in Displacement Tracking Matrix Operations for Quantifying Displacement and Mobility

I. Introduction

The Displacement Tracking Matrix (DTM) is a system to track and monitor displacement and population mobility, provide critical information to decision-makers and responders during crises, and contribute to better understandings of population flows. DTM was first conceptualized in 2004 to monitor internal displacement in Iraq and has since been adapted for implementation in over 60 countries, including in contexts of conflict, natural disaster, complex emergencies and protracted crises.¹

DTM is used across various stages of a humanitarian response – commonly during the emergency phase to inform planning and assistance and to inform preparedness activities or transition and recovery programming.² Implementation may support a cluster or another stakeholder with targeted information needs, or may be intended to contribute to common services and coordination more broadly. In other cases, it may be designed to support host governments to apply tools and methods tested during previous crises.

DTM's effectiveness in meeting varying objectives in a diverse range of contexts relies on its ability to maintain a lightweight, flexible and modular structure, enabling quick adjustments and adaptation. To preserve operational flexibility, while promoting quality and coherence across DTM activities, this framework outlines various components, tools and methods that have proven effective for quantifying displacement and mobility in DTM operations worldwide.

Given the complex and dynamic nature of many contexts where DTM is deployed, tailoring an appropriate approach can be challenging and requires an understanding of the characteristics, advantages and limitations of available components, tools and methods. Though flexibility and adaptation are encouraged, certain standards and obligations apply regardless of the method or approach selected. The sections below aim to capture good practice from past operations, presenting the framework within which DTM exercises are designed; the process for selecting and combining components, tools and methods to meet specific objectives; considerations for evaluating and mitigating limitations and risks; and guidance to ensure key principles are upheld.

¹ Including conflict in South Sudan and Libya; floods in Pakistan, Malawi and Peru; drought in Yemen and the Horn of Africa; complex and protracted crises in the Democratic Republic of Congo, Afghanistan and Central African Republic, among many others.

² For example, in preparation for future emergency responses, DTM tools and methods have been used to identify and map open spaces with potential to host displaced populations in the Kathmandu Valley in Nepal, and to conduct community and municipality profiling in the Federated States of Micronesia and the Republic of the Marshall Islands. Village assessments in South Sudan and return assessments in Nigeria and northern Mali have contributed to the evidence base for recovery programming.

2. Objectives and principles

2.1 Objectives

The overall aim of the methodological framework is to provide guidance on the selection process, expected results and limitations associated with various components, tools and methods used by DTM for quantification of displacement and mobility.

2.2 Principles

This framework has been developed with the following core principles in mind:

1. The framework promotes a **flexible** approach through inclusion of various components, tools and methods that can be combined or substituted as needed to tailor DTM implementation to a wide range of contexts. Local innovation and adaptation are encouraged, and have proven highly beneficial in past DTM operations, helping to ensure relevance, local ownership and buy-in, and use of data.
2. The framework aims to ensure the data produced through DTM is **operational and actionable**, through informed selection of components, tools and methods that respond to the objectives and characteristics of a specific context.
3. Data produced through DTM implementation should be **open source and public** to the extent that data protection, do no harm and confidentiality considerations allow. To facilitate responsible data sharing and use, Section 5 of this framework includes recommendations for risk assessment and mitigation, and Section 7 provides an overview of data governance responsibilities and guidance for data classification.
4. **Neutrality** should remain core to the implementation of activities and publishing of results under this framework. All components, tools and methods should produce data with the minimum bias possible- When feasible, an indication of confidence levels for different data records should be considered for analysis. Data suitable for public use (as per point 3 above) should be made available for independent analysis and interpretation by external stakeholders.
5. Regardless of the component, tools or methods selected, **protection** should be mainstreamed as a core consideration throughout the design and implementation of DTM exercises, building on partnerships with specialized actors and leveraging results to trigger protection activities when possible.
6. The framework promotes continuous **adaptation and learning**, building on years of experience developing, testing and refining DTM components, tools and methods in various contexts. As operations evolve and expand in future, the methodological framework will maintain flexibility to incorporate new elements over time.

3. Selection of DTM component(s)

DTM includes four standard components – each comprising various tools and methods – that can be applied, adapted and combined as relevant for a particular context. The standard components are: (i) mobility tracking; (ii) flow monitoring; (iii) registration and (iv) surveys. This section supports an initial identification of the best suited DTM component(s) to apply in a particular context, based on common information objectives and specific characteristics and constraints of the operating environment.

Given that operating environments vary widely and may entail a complex set of conditions and requirements for DTM implementation, it will often be necessary to combine various components, tools and methods into a custom approach. Other factors such as available time, resources, in-country capacities and related activities undertaken by partners/government will also impact the selection and feasibility of particular elements and combinations in a given context.

The table³ below groups DTM components, tools and methods by common information objectives and contextual considerations. Additional detail on the expected results and limitations of tools under each component is provided in Section 4.

Information objective	Contextual considerations	DTM component	Tools	Methods
To derive quantitative estimates of the presence of a population category or categories in a defined area to support advocacy and inform operational planning and response.	<ul style="list-style-type: none"> Implemented in contexts with full or limited access. Can be repeated at a set frequency (monthly, bi-monthly, weekly, daily) to capture mobility dynamics over time and refine accuracy or precision of data. 	Mobility tracking	Baseline area assessments; Baseline location assessments; Site assessments; Emergency tracking	Key informant interviews, direct observation, focus group discussions
To derive quantitative estimates of the flow of individuals through a defined location, and to collect qualitative information about populations on the move.	<ul style="list-style-type: none"> Implemented in contexts with full or limited access. Flow monitoring registry should be implemented as often as possible (preferably 7 days a week and 24 hours a day) to ensure accuracy of the data collected. 	Flow monitoring	Baseline assessment for flow monitoring (country level); Baseline assessment of flow monitoring points (local level); Flow monitoring registry	Key informant interviews, household or individual interviews, participatory mapping, direct observation
To derive census-like data on a population category using defined criteria for the population of concern, to inform operational response.	<ul style="list-style-type: none"> Implemented in contexts with full access. To be conducted upon the request of the government and/or humanitarian community for a specific purpose. 	Registration	Household registration; Individual registration	Household interview; Individual interview
To derive quantitative estimates (i.e. number, rate or proportion) of parameters representative of a population category, or	<ul style="list-style-type: none"> Target population for survey is known from credible secondary data sources. 	Surveys	Multiple tools depending on the information objective, broadly grouped under the following	Household survey; Individual survey

³ Table adapted from page 9 of http://www.reading.ac.uk/ssc/resource-packs/ICRAF_2007-11-15/research/ResMetRes/4/docs/Surveys/A%20Methodological%20Framework.pdf.

to provide qualitative information on a population category.	<ul style="list-style-type: none"> • Access allows for sampling. 		categories: Social and demographic surveys; Thematic surveys; Migration flow surveys	
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4. Description of DTM components, tools and methods

2.1 Mobility tracking

Mobility tracking aims to quantify presence of population categories, reasons for displacement, length of displacement and needs within defined locations, with a frequency that captures mobility dynamics. This component is well suited to quantifying groups of people, whether internally displaced, migrants in transit locations, stranded migrants or other populations of concern. Its approach is highly customizable: it can be light-touch or in-depth depending on the phase and requirements of the response, and often increases in depth and detail over successive rounds. Mobility tracking can be established quickly and is suitable for covering large areas, including for nationwide coverage. It is better suited for populations with some base level of stability and predictability of location, rather than highly mobile populations. However, in and out movement is routinely captured, and the event tracking tool can supplement to mitigate this limitation. The following tables provide an overview of the key tools and methods under this component:

Baseline Area Assessment

Description and objective	The objective of the baseline area assessment is to collect data on population presence in a defined large administrative area and to identify displacement locations for further assessment. It can be used following a sudden onset natural disaster or a conflict to quickly generate key information on the displacement situation, identify locations that will need to be assessed regularly, and provide a first indication of displacement figures, informing the scope and focus of subsequent data collection.
Data collected and examples of use	<p>The output is a list of locations (e.g. villages and neighbourhoods) where populations of concern (e.g. IDPs, migrants or returnees) are present, by the observed large administrative level.</p> <p>Data collected includes:</p> <ul style="list-style-type: none"> ▪ Number of individuals (IDPs, migrants or returnees) ▪ Reasons and date of displacement/return ▪ Shelter/accommodation arrangements <p>The results of the baseline area assessment can be used at the beginning of an emergency to rapidly identify the most affected areas and provide information on the scale of population movements, which can be shared to support partners. This systematic assessment of a defined geographic unit provides preliminary information and identifies locations that will need to be assessed regularly, forming the basis for more detailed assessments.</p>
Method	The data is collected through key informants and cross-checked with any available secondary sources.
Limitations and risks	The information gathered using this tool represents estimates and perceptions provided by key informants, with less precision due to the larger observation unit (e.g. district). Data accuracy is ensured through further assessments and triangulation of information when feasible.

Baseline Location Assessment

Description and objective	The objective of the baseline location assessment is to collect data on population presence in defined locations identified through the baseline area assessment (human settlements, such as villages and neighbourhoods). This allows for the collection of more exact figures at a lower level of observation. The assessment identifies where people are living and informs target sites for more detailed site assessments.
Data collected and examples of use	<p>The output is a list of sites where populations of concern (e.g. IDPs, migrants or returnees) are present, by the observed lower administrative level.</p> <p>Data collected includes:</p> <ul style="list-style-type: none"> ▪ Number of individuals (IDPs, migrants or returnees) ▪ Reasons and date of displacement/return ▪ Shelter/accommodation arrangements ▪ Needs (depending of the context) <p>The results of the baseline location assessment can be used to confirm and verify the results of the baseline area assessment and provide more granular information at a lower administrative level. They are also used to map and georeference the sites.</p>
Method	The data is collected through key informants and cross-checked with any available secondary sources.
Limitations and risks	The information gathered using this tool represents estimates and perceptions provided by key informants. However, key informants are likely to have more detailed information given the size of the observation unit (e.g. village instead of district). Data accuracy is ensured through regular assessments and triangulation of information when feasible.

Site Assessment

Description and objective	The objective of the site assessment is to collect detailed data on the living conditions and needs of populations in particular sites identified through baseline location assessments. The target population for site assessments depends on the specific scope and purpose of DTM implementation in a given context, and may include only population in camp/camp-like settings, or populations residing within host communities and/or areas of return of the observed population of concern.
Data collected and examples of use	<p>The output obtained is detailed data on the numbers, demographics, needs and mobility dynamics of populations of concern (e.g. IDPs, migrants or returnees) by site.</p> <p>Data collected includes:</p> <ul style="list-style-type: none"> ▪ Number of individuals (IDPs, migrants or returnees) ▪ Reasons and date of displacement/return ▪ Shelter/accommodation arrangements ▪ Characteristics and accessibility of the site ▪ Data on multi-sectoral needs (WASH, food, health, livelihoods, protection, communication, etc) <p>The results of the site assessment can be used to guide operational responses by identifying needs and gaps in assistance.</p>
Method	Data collection varies according to the context, resources and phase of the response. Modalities include interviews with key informants, direct observation, focus group discussions, measurements and counts.

Limitations and risks	The information provided is meant to provide basic information related to different sectors (food, wash, livelihood, etc.), which can be used to flag areas for assistance or more detailed technical assessments by sector experts.
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Emergency Event Tracking

Description and objective	The objective of event tracking is to quickly collect initial information on displacements caused by particular events, to keep pace with rapidly evolving situations during emergencies. It can serve to identify displacement events prior to the roll-out of other mobility tracking components or to provide timely updates on new displacement events occurring between assessment rounds.
Data collected and examples of use	<p>The output is an ad hoc or regular report, compiling information about recent displacements in a particular area or location that are linked to a specific, defined event and population group.</p> <p>Data collected includes:</p> <ul style="list-style-type: none"> ▪ Population group description and numbers ▪ Location the group is displaced from ▪ Location the group is displaced to ▪ Shelter/accommodation arrangements ▪ Any initial data on sectoral needs <p>Event tracking generates immediate alert reports regarding new displacements, which may trigger rapid response mechanisms for assistance. Event tracking data also feeds into planning for baseline location assessments, when required.</p>
Method	Data collection varies according to the context, available resources and phase of the migration crisis response. Modalities include interviews with key informants, direct observation and collection of secondary data.
Limitations and risks	The information provided is related to a specific event and does not always provide an overview of all population movements within a location. Only information that can be gathered quickly is captured, and it may thus be incomplete. The data collected through this method can be used to identify locations where specific assessments need to be conducted to obtain more information, and/or to deliver rapid assistance.

4.2 Flow monitoring

Flow monitoring aims to derive quantitative estimates of the flow of individuals through specific locations and to collect information about the profiles, intentions and needs of the people moving. This component is well suited to quantifying highly mobile populations and providing a picture of complex mobility dynamics. It can be established quickly and is suitable for comprehensively covering distinct points. The following tables provide an overview of the key tools and methods under this component:

Baseline Assessment for Flow Monitoring (country level)

Description and objective	The objective of the baseline assessment conducted at country level is to identify areas with population movements of interest where Flow Monitoring Points could be established, if needed.
Data collected and examples of use	<p>The output is a list of potential Flow Monitoring Points.</p> <p>Data collected includes:</p>

	<ul style="list-style-type: none"> • List of key informants • List of points (location, type of points, type of movements) • List of institutions, NGOs, international organizations operating in the identified areas <p>The data is used to guide the implementation of Flow Monitoring exercises, when locations of interest for Flow Monitoring Points are not already known.</p>
Method	Data is collected through participatory mapping with authorities and concerned partners.
Limitations and risks	The information provided are collected through discussions with key informants and only give initial indications about areas with high mobility. Field assessments need to be conducted to verify and confirm the information provided.

Baseline Assessment of Flow Monitoring Points (local level)

Description and objective	The objective of the baseline assessment conducted at local level is to collect detailed information about the Flow Monitoring Points through field visits. These points might have been identified during the mobility area assessment at national level or were previously known locations of interest.
Data collected and examples of use	<p>The output is a profile of Flow Monitoring Points.</p> <p>Data collected includes:</p> <ul style="list-style-type: none"> • List of key informants • Description of points (location, type of points, mode of transport, direction of flows) • Assistance available • List of institutions, NGOs, international organizations operating in the identified areas
Method	Data is collected through interviews with key informants and through direct observation.
Limitations and risks	The information provided are collected during brief field visits and only give a general overview of the population flows transit through identified points. More detailed assessments are required to better understand the mobility dynamics in these Flow Monitoring Points.

Flow Monitoring Registry

Description and objective	The objective of the flow monitoring registry is to collect information on the volume and basic characteristics of populations transiting during observation hours at selected Flow Monitoring Points.
Data collected and examples of use	<p>The output is data on the individuals and groups moving through a transit location where a Flow Monitoring Point has been established.</p> <p>Data collected includes:</p> <ul style="list-style-type: none"> ▪ Number, age and sex of individuals in the group in transit (disaggregation by age and sex may not be possible in early stages) ▪ Previous transit point(s) and next destination (when possible, intended final destination as well) ▪ Nationality ▪ Means of transportation

	The data collected is used to assess displacement or migration flows and trends inside a country, within a region or among regions.
Method	Data collection techniques include short interviews with individuals and key informants, or direct observation depending on the context, access and time allocated for the exercise.
Limitations and risks	Data collected represents the situation at specific points of transit at certain times, and provides only a partial view of the volume and characteristics of population flows transiting through the Flow Monitoring Points. This tool does not intend to provide a total number of all transiting populations, but rather to estimate volume and characteristics of population flows transiting through an observed point.

4.3 Registration

Registration aims to derive census-like data in a location or locations, against defined criteria for the population of concern. This component captures detailed data at individual or household level. It can be time and resource intensive, and is suitable for established locations hosting populations of concern.

In humanitarian contexts, the scope and purpose of registration activities are limited to support the targeting and delivery of assistance, and are well-regulated in terms of data protection to minimise personally identifiable data. Registration data is collected to the minimum level of detail required to allocate assistance and services, and is maintained for the shortest duration necessary to complete those activities, in line with data protection policies and guidance.

Registration

Description and objective	The objective of registration is to derive census-like data on the population of concern in a location or locations, against defined criteria.
Data collected and examples of use	<p>The output depends on the specific purpose of the exercise, but will generally be core census-like data on the population of concern against the defined criteria.</p> <p>Data collected includes (at minimum):</p> <ul style="list-style-type: none"> ▪ Names, age and sex of individuals ▪ Information on individuals with specific vulnerabilities ▪ Place of origin <p>Registration data has been used for a wide variety of direct assistance programs (e.g. food distribution, construction of shelter, support to the most vulnerable individuals, etc.) as well as for assisted movements such as relocation and return operations.</p>
Method	Registration generally involves three phases: (i) 'fixing' (identification of population of concern); (ii) data collection (household or individual registration); and (iii) data processing/analysis. In some contexts, registration is conducted using biometric technology.
Limitations and risks	The information collected through this method contains personal data which can be misused if not handled properly. To mitigate the risks, registration processes are conducted as per the IOM data protection principles.

4.4 Survey

A survey is a standardized way of collecting information on a population of concern. In case of a large group, a survey may be conducted on a sample of the population. In case of a small group, the entire population may be surveyed.

The survey component of DTM is used to enrich and complement the other components. It describes characteristics and provides a deeper understanding of populations of concern (e.g. IDPs, returnees, migrants). The data can be collected through qualitative or quantitative methods, based on the type of information required, and through individual or household interviews. Surveys used by DTM can be broadly grouped into the following categories: social and demographic surveys, various thematic surveys and migration flow surveys.

When the method chosen is a quantitative one, the sample can be designed to be statistically representative of the population under study (the “universe” for analysis) or not. In the case of a representative sample, the findings can be extrapolated to the universe. To be able to design a statistically representative sample (also called a “probabilistic” sample), a sample frame or sample list needs to be retrieved or built. The sampling list is a list or a count of all the units that make the universe, so that a sample can be drawn from that list.

Through its registration, mobility tracking and flow monitoring components, the DTM system normally builds and regularly updates what can be considered and used as a sampling frame (master list of locations and numbers). Using the master lists as sampling frames allows DTM to draw probabilistic samples of individual IDPs or people on the move and produce findings that can be generalized to the entire population.

When an individual list is available, built through a registration exercise, units can be drawn and interviewed. When the list is built through mobility tracking and flow monitoring components, the list is not individual. Thus, only the sample size can be determined and the allocation of the sample will be done at field level. In those cases, the allocation of the sample or the selection of individuals to interview can be done based on DTM field teams’ knowledge of the territory, acquired through the implementation of other DTM components.

5. Limitations and risks

Data collection methods carry certain limitations and risks, to be considered and mitigated to the extent possible during the design and implementation of DTM activities. Specific limitations and risks associated with DTM tools and methods covered in this framework are indicated in the tables in the previous section. Limitations and risks may vary depending on the tools and methods that are adapted or combined. The characteristics of a particular implementation approach and any related caveats for analysis or use of the data produced, may be indicated in the methodology section of DTM information products.

In the early stages of a response, provision of the best information possible within the shortest time frame may be prioritized over statistical robustness of data, in order to produce an initial indication of population movements and needs to kick-start response planning. As access expands and the universe of analysis becomes known with more certainty, DTM exercises may be adapted or expanded to incorporate additional tools and methods, generating information with greater precision or granularity. Data collection through DTM is repeated in multiple rounds to regularly refresh and refine available information and to adapt as needed to changes in the operational context or information objectives. Past implementation experience has shown that different components, tools and methods may become relevant at different stages of an operation, and combining elements can strengthen an approach and enrich the data and information produced.

Given variations in approaches and operating environments, a risk assessment is recommended when designing a DTM exercise to identify areas of concern specific to the context and ensure mitigation measures are in place throughout implementation.⁴ This includes identification of potential risks for

⁴ This is an important exercise, that often does not need to be time or resource intensive. The aim is to ensure potential risks are anticipated, recognized and mitigated in all stages of the DTM process.

mobile populations when selecting components, tools and methods during the planning stages, as well as regular monitoring and adjustments to minimize risks throughout implementation. Do No Harm is to be prioritised throughout the entire process, including during analysis of results and sharing of data. Including an explanation of the approach, objectives and limitations of data collection when disseminating DTM products can mitigate the risk of inaccurate or misleading data analysis by third parties, for purposes that undermine the well-being of populations on the move.

6. Selection of data fields, indicators and questions

Following the selection or combination of elements for DTM implementation, it is necessary to designate key data fields, indicators and questions for the selected tools. A Data Dictionary exists at the global level to guide and simplify this process, facilitating standardization and comparability of data attributes (values and formats) and indicators among country exercises, and streamlining workflows for aggregation. The Data Dictionary further supports data sharing with partners, providing metadata to orient users on the content of DTM datasets.

The Data Dictionary includes core indicators and data attributes for each DTM component, to be included in all exercises, as well as standard indicators that can be incorporated as useful and relevant for a given context. Additional indicators can be integrated into ongoing DTM exercises over time to fill information gaps or respond to changing needs within the operating environment. Data attributes that were collected previously should not be changed or removed when new indicators are added, to ensure the completeness of the database for future historical record and analysis.

DTM identifies vulnerable groups and gathers sex and age disaggregated data where possible to enhance inclusivity of response activities. DTM uses commonly agreed categories for the identification of vulnerable groups, included in the Data Dictionary, while also incorporating context-specific indicators of vulnerability.⁵

7. Data classification and responsibilities

DTM data is governed according to IOM's Migration Data Governance Policy and Guidelines. Datasets are classified according to risk exposure in case of unauthorized access. Data responsibility of IOM staff is defined according to roles (Data Trustee, Data Steward, Data Manager and Data Custodian). IOM staff working on DTM should read IOM's Migration Data Governance Policy and Guidelines.

8. Conclusion

DTM exercises have been developed, tailored and refined during years of operational experience in a wide range of contexts to track and monitor mobile populations and their needs. A key factor in DTM's effectiveness to date has been the flexibility to customize the design and approach by selecting and combining tools and methods to achieve the desired objectives within a specific operating environment.

This framework aims to facilitate continued innovation, adaptation and learning, while promoting quality, coherence and application of good practice across DTM operations worldwide. The previous sections have been designed to support the identification of appropriate components, tools and methods for designing DTM activities, within a framework that prioritises core principles, quality assurance, data governance and other related concerns.

⁵ For example, in many contexts, young males are particularly prone to forced recruitment but are often excluded from standard vulnerability categories.