

**Methodological Framework used in Displacement Tracking Matrix Operations for Connectivity Maps using Flow Monitoring in Response to COVID-19**

<p><b>Description and Objective</b></p>	<p>The current outbreak of COVID-19 has affected global mobility in the form of various travel disruptions, restrictions and blockages. Understanding historic mobility patterns and the connections between geographic locations provide a benchmark for the possible pathways the outbreak could spread COVID-19. Additionally, it could also serve as a reference to measure the changes on human mobility due to the outbreak.</p>
<p><b>Data Source</b></p>	<p>Connectivity maps uses the DTM Flow Monitoring Registry (FMR) operational data. Flow Monitoring is one of the DTM methodological components and is used to derive quantitative estimates of the flow of individuals through a defined location to capture dynamics of highly mobile populations. Its objective is to provide regular and updated indicative trends for mobility at country and regional level and support decision making in development and policy processes that depend on a better understanding of risks, needs and drivers of migration. Specifically, FMR aims at routinely collecting rough estimates on the volume and basic characteristics of the migrant population transiting during observation hours at selected locations, or Flow Monitoring Points along high mobility migration routes.</p> <p><b>Target population:</b> Population on the move passing by FMP on buses, trucks, private vehicles, by foot, etc.</p> <p><b>Data collection method:</b> Data is collected through interviews with KI and direct observation. Information is triangulated with official sources (border post registry, health registry) or unofficial sources, when available.</p>
<p><b>Observation Units (Location Type)</b></p>	<p>For this exercise, the data is collected on high mobility locations, or Flow Monitoring points (FMPs) taking into consideration the following criteria:</p> <p>Relevance in filling information gaps for mixed migration mobility; Safety of migrants and opportunity to set up referral mechanisms; Access and security; Possibility to implement the data collection; Time available for surveys and registry; Staffing and schedule of movements; Relation with other FMPs in country, in the Region and on the whole route;</p>
<p><b>Population Categories</b></p>	<p>Even though FMR captures different population categories and nationalities, for the Connectivity Maps, only the total number of individuals in transit across the FMPs is considered.</p>
<p><b>Aggregation</b></p>	<p><b>Temporal:</b> Connectivity maps uses the aggregate of the total period of data collection. Such period is can be different for each FMP.</p> <p>Data is divided by two types of movements, <b>incoming</b> and <b>outgoing</b>.</p> <p><b>Incoming</b> movements corresponds to the individual movements coming from abroad the country of survey with destination some location inside the country of survey. Those movements are shown in green in the connectivity maps.</p> <p><b>Outgoing</b> movements corresponds to the individual movements departing from some location inside the country of survey whose destination is outside the country of origin. Those movements are shown in blue in the connectivity maps.</p> <p><b>Spatial:</b> Individual movements are aggregated by FMP. Depending on the type of movement, i.e. <b>incoming</b> or <b>outgoing</b>, the individual movements are also aggregate by Admin level 1 of origin (for incoming movements) or Admin level 1 of destination (for outgoing movements) and by Destination Admin Level 1</p>

<p><b>Data Analysis</b></p>	<p>There are two types of Connectivity maps, ‘<i>incoming</i>’ maps and ‘<i>outgoing</i>’ maps depending on the type of movement. Additionally, those maps could be</p> <p><b>Sub-national</b> (showing the movements connections between FMPs and Admin Levels 1 inside the country of survey) or;</p> <p><b>International</b> (showing movements between FMPs and countries)</p> <p>The maps are produced using lines to connect the different locations to the FMPs. An edge bundling algorithm is used to improve the visibility of the links, clustering the links according to their similarity. More details could be find in the paper <i>Holten et al</i> <a href="#">Force-Directed Edge Bundling for Graph Visualization</a>.</p>
<p><b>Limitations</b></p>	<p>Data collected for FMR exercises should be understood as <b>estimations only</b>. They represent only part of the total population flows passing through the flow monitoring points. The spatial and temporal coverage of this data collection activity is therefore incomplete.</p> <p>Connectivity maps shows <b>only geo-referenced</b> data, that means it is not showing the entire data set of FMR. For <b>Subnational</b> maps, the information about the Admin Level 1 is not <b>always</b> available.</p>