ENVISIONING USE OF MOBILITY DATA IN PRACTICE

Data doesn't always equate to purpose and meaning

The COVID-19 Mobility Data Network (CMDN) introduced not only big data but also a whole new type of data to government agencies throughout the world. The Network's intent was to

> *"...establish routine analytic pipelines between tech companies and policy makers, providing meaningful policy-relevant information supported with scientific evidence and methodological rigor. These data will prove useful to communities, businesses and governments as restrictions are relaxed and policies to resume lives and livelihoods are planned, as national lockdowns and travel restrictions have resulted in highly unusual migration patterns." - COVID-19 Mobility Data Network*

Mobility data faced similar challenges of adoption that many other large and new data sources face during dynamic and uncertain settings, especially during disasters. Balancing the proposed and theoretical opportunities of using mobility data with more traditional data types (e.g., case data, hospital facility data, socio-economic data) was often difficult for some government teams to manage. Using Facebook mobility data and having little familiarity with its limitations created a challenging landscape not only for practitioners but also for some researchers with public health, engineering, data, and Geographic Information System (GIS) expertise.

This experience is not new in disaster and humanitarian settings. For the CMDN, the road to translating data into action was often a road less traveled and bumpy at times. It had many turns and some unexpected roadblocks. For few, it became a dead end. One early challenge groups faced was achieving a deeper and more targeted understanding of how this data could meet the purpose of their COVID-19 response work. And, more importantly, how could the results of the data fulfill a purpose or need specific to their city, county, or region. Would the results prove meaningful to their daily response activities?

"Finding ways to make big data useful to humanitarian decision makers is one of the great challenges and opportunities, of the network age."

-United Nations Office for the Coordination of Humanitarian Affairs (OCHA)

FORMULATING A QUESTION THAT MEETS THE PURPOSE

One of the first steps of aligning data and use is a common understanding among collaborators about 1) the ultimate goal for using the data and 2) if the meaning or insight that emerges from the data is aligned with the group's specific purpose.

As expected, government collaborators in the Network easily understood the relationship between the individual or group movement and the spread of COVID-19. Social distancing policies, from travel restrictions to quarantine, were a familiar lived experience around the world. So, theoretically, looking at data about movement made sense but getting to the next step was a challenge for many collaborators.

Specifying relevant questions for each group required not only access to data, but also data literacy, often a data translator, and time to formulate specific questions and envision how the results may impact their daily work. Teams in British Columbia and Southeast Asia had previous experience using mobility data and were able to progress more quickly. The communications team from Los Angeles, California was able to specify their purpose and objective, enabling a smoother journey with Christine Tedijano, a doctoral student at the Harvard TH Chan School of Public Health.

ASKING QUESTIONS THAT THE DATA COULDN'T ANSWER

Many public health providers and government practitioners thought that the Facebook mobility data would show them which priority neighborhoods in their jurisdiction were abiding by the social distancing policies. For some, achieving an action-centered neighborhood view was not possible. In Philadelphia, the neighborhood level data looked different from the way city public health teams were defining neighborhoods in their daily activities, ultimately not providing them the specific neighborhoods or locations that they were most interested in.

"Although they were less familiar with these types of data products, we fine tuned metrics that were useful and easy for them to understand. They were always really clear about their objectives."

- Christine Tedijano, graduate student, Harvard University

"It took a bit of time to wrap our heads around it. As there was nothing to compare it to from the past."

- Senior Data Fellow, Florida

"This is really hard, we were all scrambling, they didn't know what the important questions were, and we didn't know either. We didn't have time to devote to thinking about it"

- Ayesha Mahmud, Department of Demography, University of California Berkeley

Many also hoped that the data would show them deeper insights about age, gender, and socioeconomic status (SES). Others realized that the areas they were most interested in did not contain enough Facebook data due to tile sparsity. As a result, some groups sought other datasets to meet their needs.

HEALTH FACTORS
RANKINGS
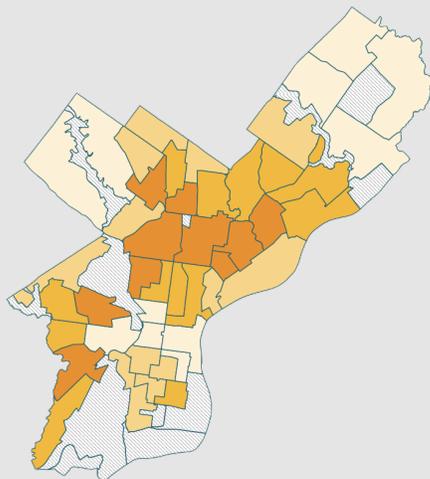
Percent Change in Number of Trips: Philadelphia
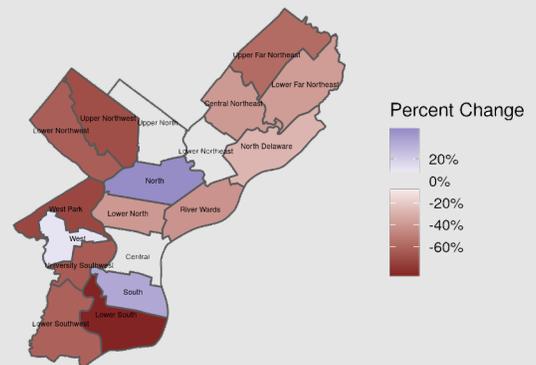
IMPACT ON COLLABORATIONS AND EVENTUAL USE

In Philadelphia, while the data showed general movement within the city, it lacked the neighborhood specificity that they needed. Despite being able to integrate a few demographic variables of interest, the team wasn't able to achieve a level of meaning that was useful for their Department of Public Health. In the end, even though there was an abundance of Facebook data to work with, it lacked meaning for the purposes that were important to them. In Tennessee, a university hospital data analyst was unable to use the data as it lacked the location specificity of interest; bars and restaurants.

"it was Easter Sunday, and there was this huge spike in mobility. And so, that really got us interested in being able to layer [mobility data] with other [data] and map it. And we had conversations around mapping ... specific weekends or if we knew there were going to be events happening."

- Amanda Darcangelo, Data Engineer, Syracuse County

It also lacked mobility data from the beginning of the pandemic and could not be integrated into larger data models that the university hospital was using to support statewide public health groups. Keith Britt ended up using other data sources to meet his needs. (see Brief - Mobility Data Beyond Facebook)

Teams in other contexts were able to learn more about whether the results were meaningful and eventually found alignment. Achieving this alignment, however, often took significant work, such as continuous probing and manipulation of the data. For example, the Chile team (Case Study 1) and the Syracuse team (Case Study 2) eventually aligned the data over time to their evolving priorities and overall purpose. The Syracuse team was able to directly manipulate Facebook population data as a proxy for movement, confirming that there was increased movement across the city during Easter holiday weekend (4/11-4/12/2020). As the team learned more about the opportunities and limitations of the Facebook data they refined their approaches, ultimately aligning their purpose of monitoring holidays and other specific events and phases of reopening. The Chile team was able to adapt and integrate socioeconomic data to achieve insights about whether movement was associated with socio-economic disparities.

Team adaptation through dynamic learning and communication can help both researchers and practitioners build data literacy, helping them get over the initial hurdle of expecting that data alone can provide meaningful results that align with their specific purpose and priorities. In the future, helping groups gain a deeper understanding of why data doesn't always equate to purpose and meaning can help teams further iterate and adapt their collaborative work.

For a more detailed discussion see the following brief, "*Moving from Purpose to meaning with COVID-19 mobility data.*"