

## ENVISIONING USE OF THE MOBILITY DATA IN PRACTICE

### *Moving from purpose to meaning with COVID-19 mobility data*

Understanding the meaning of mobility data in specific COVID-19 contexts was a much deeper and more complex question. The majority of groups understood the general relationship of how movement was related to the spread of COVID-19, and how various policy measures for movement restriction around the world could curb the pandemic. But the more specific questions that arose in Asia to support the national response, were different from questions and sharing needs that arose to support the response in the medium size county Colorado, United States. Another team in Barcelona, Spain aimed to support the European Commission with general updates, but did not intend to influence regional or local activities. Teams in Bogota, Colombia were facing questions about the utility of strict quarantine measures when perceived cases were lower than other parts of the world. Analyzing mobility data has *potential meaning* in understanding how social restriction policies impact population movement, but many teams hit their first road block at this stage.

### ROADBLOCKS

Geographic unit of analysis, community of practice, and analysis time periods created a series of initial barriers that kept some groups from attaining meaningful results that practitioners felt would be useful for their response activities. Where teams turned to as a result are further described in the brief "[Mobility Data Beyond Facebook & Data Seeking Behaviors](#)".

*"A key challenge to using mobility data is getting it at a scale that is relevant to what we are trying to do at a local scale. We didn't have analysts that were used to this data. We also had skepticism about the data."*

*- Integrated Data Team (IDT), NYC Dept of Health and Mental Hygiene*

### **Viewing space in the same way you communicate it**

Geographic units of analysis, or looking at movement at the neighborhood, town, or county level, presented many challenges for teams to navigate. were mapped in a way that practitioners felt were difficult to communicate to others, and for many, this further created a barrier for many to trust mobility data which they had never used before.

While the mobility data could be analyzed in specific geographic data formats such as county administrative levels and even census tracts, this was not necessarily how practitioners in many cities think or communicate information about public health issues and response activities. Frequently, the initial analyses.

For example, the New York City (NYC) public health team worked with a researcher to adapt the initial geographic unit of analysis to neighborhood tabulation areas (NTAs) to enable a more practical way to visualize different boroughs and neighborhoods across NYC. In Philadelphia, while the team was able to see a larger part of the city, they were most interested in administrative and planning districts at a much smaller scale which was valued by the Department of Public Health. Despite additional calls to request or explore a smaller unit of analysis, they were unable to solve this problem ([Brief 2](#)). This was described as a major barrier and one of the major limitations that resulted in non-use for the Philadelphia group. The Syracuse team moved from Facebook movement data to population density data as an alternative approach, while others in Kansas and New Orleans used census tract data to try to better highlight the meaning of the data for the specific groups they were trying to support.

### **Trying to resolve missing data**

For some groups, when the analyzed data was presented, something didn't look right. Areas of missing data were due to the way in which Facebook as a company acquires mobility data. Teams from Colorado, as well as rural areas of Chile with more sparsely populated regions, would see no movement.

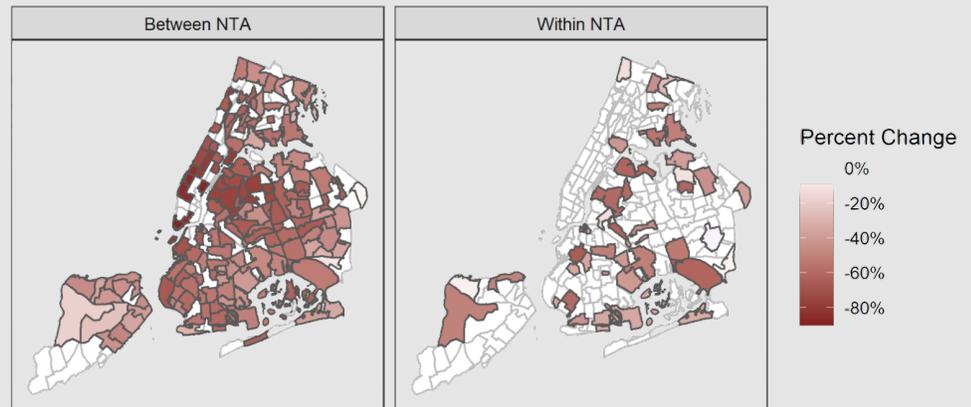
*"We are still iterating on how to present this in a way that would be useful and then we stopped when we realized we could not get more finely resolved data."*

*- Megan Todd, Public Health Scientist Philadelphia Department of Public Health*

*“The bottom of Staten Island was cut off, it was odd to see that it was missing. And then going back and addressing that. Nishant gave us in-kind support...The fact that we could talk to him, and he would build something and then we could talk about it. Was a real key.”*

*- Integrated Data Team (IDT), NYC Dept of Health and Mental Hygiene*

Percent Change in # of trips - NYC - Tue, Mar 31



in areas where they knew movement existed. They soon realized that it was the way that Facebook algorithms collected and anonymized data for privacy purposes.

For other teams there was data missing from the early days and weeks of the COVID-19 pandemic. Groups that joined the Network later in the COVID-19 pandemic would only trigger data collection for their region at that time, unless another group from the region had asked for the data earlier. Comparisons to baseline, and comparisons to previous days and weeks, were crucial comparisons for many groups. For many without data from January and February of 2020, the missing data became the impediment of attaining meaningful analysis. Teams in Tennessee and in British Columbia, Canada were some examples, and they both sought out other mobility data sources to meet their needs. (See Brief- [Mobility Data Beyond Facebook & Data Seeking Behaviors](#))

In NYC, original analysis in March 2020, showed no movement in a portion of Staten Island, which was not possible intuitively by those familiar with this borough. They brought this to the attention of Nishant Kishore, their research collaborator and a graduate student at Harvard University, to try to resolve the missing data. In the end, the NYC group was able to resolve the missing data, providing a more comprehensive view of mobility changes during the largest outbreak in the United States at that time.

### **Achieving a level of trust**

There were more fundamental challenges that groups faced, specifically trusting mobility data. Facebook mobility data has novel metrics often not previously used by public health specialists or emergency operational managers. It proved difficult for even government data teams to explain the results to managers and other decision-makers. The lack of data literacy around mobility data in public health and policy environments likely contributed to the lack of trust at the decision-making level. This project was limited in directly interviewing primary decision-makers involved in response activities. Lessons learned from disaster and humanitarian settings have shown that trust plays a key role in adoption of new ideas and new ways of working. In high pressure settings, often trusting what you don't know and can't understand can be a herculean task.

Many practitioners found Facebook's mobility data and its lack of clarity on representativeness a barrier to trusting the data. Facebook mobility data is dependent on users who must consent to be tracked on the application. In parts of India it is widely known that other apps such, as Whatsapp, are much more frequently used than Facebook. Adoption patterns, digital literacy, and the prevalence of SMARTphone technology were some contributing factors. Some felt there was a lack of transparency about which population groups were under or over-represented. The NYC team initially struggled to trust mobility data because they believed it lacked representativeness. The data team, composed of data specialists, public health providers, and GIS analysts in NYC, worked closely with Nishant Kishore. Initially, the data's representativeness was felt to be a major data requirement for integrating these data sources into traditional public health planning. They recognized that the mobility data presented a whole new data stream that they were not familiar with. They also learned how to communicate the value of mobility data to decision-makers and policy makers. Ultimately through a series of iterations and collaborations, the team was able to share their findings at incident command meetings and are now using mobility data in models to anticipate the second wave of COVID-19 cases.

*"We had no idea who was in the sample, and what the sample looked like. And that was a major point of contention when we had to explain it. In public health you have to document rigorously what your sample looks like, and how generalizable it is, and how it affects your interpretation."*

*- Integrated Data Team (IDT), NYC  
Dept of Health and Mental  
Hygiene*

*"To explain that, this is a new frontier, including how it is collected, and analyzed, and what are the limitations."*

*- Integrated Data Team (IDT), NYC  
Dept of Health and Mental  
Hygiene*

Two other research groups, one in Asia and another in British Columbia, appeared to have a familiarity with mobility data during previous outbreaks of disease, and also have pre-existing relationships with their respective governments at the national and provincial levels. A researcher who worked with public health officials in Asia had previously designed training sessions on how to use mobility data before COVID-19. Pre-disaster data literacy and pre-existing relationships likely played a significant role in establishing a level of trust between the researchers and national-level public health officials before the COVID-19 pandemic.

Mobility data presented not only new metrics unfamiliar to many public health practitioners and emergency managers, but challenged some public health principles of representativeness. For some groups, the lack of relevant meaning from analyses further eroded trust in the data and likely led to its non-use. For others, it may have had meaning but for the end decision-maker it may not have been trusted, limiting its use. Nonetheless, based upon 40+ interviews across the Network, many groups were able to iterate and in near real-time learn about the limitations and added value of mobility data, eventually using it in their response activities.

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