Successful, Easy to Access, Online Publication of COVID-19 Data During the Pandemic, New York City, 2020

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Making public health data easier to access, understand, and use makes it more likely that the data will be influential. Throughout the COVID-19 pandemic, the New York City (NYC) Department of Health and Mental Hygiene's Web-based data communication became a cornerstone of NYC's response and allowed the public, journalists, and researchers to access and understand the data in a way that supported the pandemic response and brought attention to the deeply unequal patterns of COVID-19's morbidity and mortality in NYC. (*Am J Public Health*. 2021;111(S3):S193–S196. https://doi.org/10.2105/AJPH.2021.306446)

Early in the COVID-19 pandemic, the New York City (NYC) Department of Health and Mental Hygiene (DOHMH) began reporting COVID-19 data on its Web page. The agency prioritized simplicity, user-friendliness, and transparency in its COVID-19 data communication. We describe the DOHMH's strategy, methods, and results.

INTERVENTION

Because the strategies behind how data are communicated are as critical as the data themselves, the DOHMH published data in a way that made them easy to access, understand, and use. Our goals were to inform the public, guide deployment of city testing and outreach resources, empower researchers and journalists with access to data, and help other jurisdictions plan for the impact of COVID-19.

PLACE AND TIME

The DOHMH in NYC began reporting NYC's COVID-19 morbidity and mortality data on its Web page in March 2020. Our work is ongoing.

PERSON

The DOHMH worked to reach the public, journalists, community advocates, elected officials, and researchers, both locally and globally. The DOHMH designed information for lay audiences to understand and provided details designed to support experts' data use.

PURPOSE

NYC was an early epicenter of the COVID-19 pandemic in the United States as initial undetected spread led to a dramatic acceleration of the local pandemic.[1] The DOHMH prioritized clearly communicating data so that the public, local officials, and other stakeholders could easily and accurately understand the local pandemic. During emergencies, it is vital to collect data on disparities to address them. Data published online by the DOHMH were among the earliest evidence of the disproportionate impact of COVID-19 on the Black and Hispanic/Latino populations in the United States and on high-poverty neighborhoods. Making data easy to access and understand helped focus resources such as testing and supportive services on communities with high burdens.

IMPLEMENTATION

Early in the pandemic, the DOHMH prioritized digitally publishing COVID-19 data. Its data communication strategy followed principles of user-friendliness, emphasizing explanation, open access

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to data and documentation, and iterative development.

User-Friendliness

To make data easy for all to access and understand, the DOHMH published data through interactive visualizations on standard DOHMH Web pages. The DOHMH used a tool called Datawrapper (www.datawrapper.de). This allowed the agency to design interactive visualizations that allow users to select metrics, filter data, and hover for values (Figure A [available as a supplement to the online version of this article at http://www.ajph.org]). These user-friendly visualizations helped make complex data easy to understand for nontechnical audiences.

Many Web data dashboard platforms fail to accommodate mobile responsiveness, make it difficult to access visualizations' source data, and have limited screen reader accessibility—all of which limit access to people with different needs. Publishing on standard Web page templates allowed the DOHMH to build Web content with basic programming skills in HTML and CSS, the cornerstone languages of the Internet, without requiring custom tools or specialized expertise. Standard Web pages provided flexibility to ensure keyboard navigation, which supported users with mobility impairments, and accessibility by screen readers, which allowed people with visual impairments to access the data. This made data more accessible, regardless of a user's impairments or need for adaptive technologies.

Emphasizing Explanation

A visualization's design affects audience comprehension of data and is especially important when an audience is unfamiliar with the subject. The DOHMH designed visualizations informed by evidence-based approaches to support comprehension,[2] such as simplifying charts by removing gridlines and borders and focusing the data displayed, using color for emphasis, and sorting values from high to low. These approaches are vital for communicating data clearly and effectively. The DOHMH also supplemented visualizations with simple explanations, metric definitions, and comments on limitations throughout the Web pages. Incorporating these explanatory strategies supports the broader use of data by making the stories in the data easier to understand.

Open Access to Data and Documentation

The DOHMH provided the data as machine-readable, comma-separated value files, which allows users such as media outlets, data aggregators, and academic researchers to easily pull data into their systems for analysis. The DOHMH manages these data files on GitHub (www.github.com), a widely used platform for open-source software. Using GitHub allowed the DOHMH to reach a large community of data-savvy practitioners who can automatically download data as they are updated. Furthermore, using GitHub allowed the DOHMH to post extensive documentation that supported users' interpretation and use of the data and avoided cluttering visualizations with footnotes that can compromise comprehensibility.

Iterative Development

As the COVID-19 pandemic evolved, the most important questions of the moment also evolved. Throughout the pandemic, the DOHMH released additional data and visualizations, including ways for users to view data by neighborhood, and displays of recent trends as cumulative data became less informative. These iterative developments were informed by user feedback. Through surveys for Web page visitors, GitHub comments from active users, formal data presentations to local officials, and monitoring social media conversations, the DOHMH solicited user feedback to understand what data elements needed improvement and enhanced the data, visualizations, interactivity, and documentation to aid understanding and use. This ensured that as the pandemic evolved and people asked new questions, the data could continue to help shape the narrative and inform the response.

EVALUATION

After launching, the COVID-19 data Web pages became the most trafficked portion of the DOHMH Web site. From April to November 2020, the data Web pages averaged more than 1.5 million monthly page views, making up more than 40% of all DOHMH Web traffic (Figure 1). The intense interest in these Web pages strongly suggests that they aided access to and use of the data and that clear data communications can be a powerful way to engage audiences.

With news outlets and academics able to easily and reliably access data through GitHub, these data were shared with larger audiences through articles and academic papers, including graphical features in the *New York Times*,[3] and academic papers on profound disparities in the United States.[4]

Widely accessed and used, these data helped frame the narrative on the exacerbation of disparities during the COVID-19 pandemic. Informed by these data, NYC launched "hyperlocal" activations

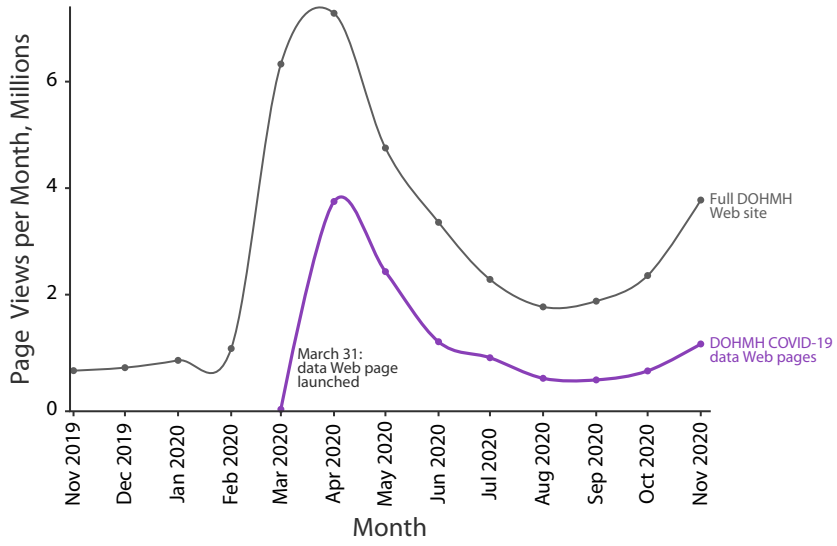

FIGURE 1— Monthly Page Views to the Department of Health and Mental Hygiene (DOHMH) Web Site and to the COVID-19 Data Web Pages: New York City, November 2019–November 2020

providing outreach, testing, and supportive services to historically disinvested communities that suffered the highest levels of morbidity and mortality during the first wave of COVID-19.[5]

ADVERSE EFFECTS

No adverse effects were identified, but the DOHMH continues to monitor how data are received and understood by users to ensure that its data are easy to understand and use.

SUSTAINABILITY

For this work, the DOHMH used free products that required few specialized skills and strategies that can be replicated in other jurisdictions. Many public agencies may have limited expertise or infrastructure to produce high-quality digital products, but the DOHMH has shown that communicating data effectively does not require additional resources or specialized technical expertise.

PUBLIC HEALTH SIGNIFICANCE

Collecting and sharing data are core functions of public health agencies,[6] and a part of this responsibility should include providing data in formats that the public can access, understand, and use. By providing open access to data and reliable updates, the DOHMH engendered trust with influential audiences, supported broader use of its data, and laid foundations for future data communication practices.

The COVID-19 pandemic has been marked by inconsistent data availability, sometimes conflicting data,[7] and severe disparities by race, ethnicity, and poverty. An effective population-based response is rooted in part by data that are trusted and understood by many different communities. With a strategy of user-friendliness, explanation, open access, and iterative development, the DOHMH allowed its data to play a powerful role in the response to COVID-19, shape public understanding of the pandemic, and equip all with data that can help people respond. AJPH

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

HUMAN PARTICIPANT PROTECTION

The work described did not include human participants, so no institutional review board approval was necessary.

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