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IN DEPTH

Combating Misinformation as a Core Function of Public Health

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The New York City Department of Health and Mental Hygiene determined that the spread of misinformation about Covid-19 was having a harmful health impact, particularly on communities of color with low vaccination rates. It established a dedicated Misinformation Response Unit to monitor messages containing dangerous misinformation presented on multiple media platforms, including social media, non-English media, and international sites, and proliferating in community forums. The Misinformation Response Unit and the Health Department collaborated with more than 100 community partners to tailor culturally appropriate, scientifically accurate messages to different populations. The Health Department and its partners were able to rapidly identify messages containing inaccurate information about Covid-19 vaccines, treatment, and other issues and to support the delivery of accurate information to various populations. Although the harms of misinformation and benefits of addressing the problem require additional evaluation, internal and external interviews suggested that the Misinformation Response Unit helped the Health Department counter misinformation and disseminate accurate scientific information to the community, thus improving health and vaccine equity during the Covid-19 pandemic.

The Challenge of Misinformation

Misinformation has run rampant during the Covid-19 public health emergency, challenging the communication and trust-building efforts of public health and medical professionals. Nearly

2 years into the global Covid-19 vaccination campaign, misinformation remains a driving force behind vaccine hesitancy, leading to calls for action from the U.S. Surgeon General,[1] the World Health Organization,[2] and medical experts.[3] Although health misinformation is not new, it has been exacerbated in this era of "fake news" and globalized social media. In a 2021 Kaiser Family Foundation survey, nearly 8 in 10 people endorsed or considered a common falsehood about Covid-19.[4] Misinformation has caused harmful societal effects, from reluctance to receive a Covid-19 vaccine or follow masking and quarantining guidance to distrust of and threats of violence against public health workers.[5]

In New York City (NYC), Covid-19 misinformation has permeated all five boroughs of the city, from Nation of Islam antivaccine posters in Bronx public housing that claim vaccines are a form of population control[6] to Russian-language statements in Brooklyn that western vaccines could turn people into monkeys.[7] Faith-based leaders reported that congregants asked worried questions about fetal cells in vaccines, while community groups highlighted pervasive misunderstandings of vaccine side effects reported to the national Vaccine Adverse Event Reporting System database.[8] Social media scans show the proliferation of antivaccine content in NYC online forums on Facebook, Twitter, WhatsApp, Nextdoor, and other platforms.[9]

Health Department Response

In recognition of the growing threat of misinformation, the NYC Department of Health and Mental Hygiene (hereafter referred to as the Health Department) formalized and implemented its response through a dedicated Misinformation Response Unit starting in March 2021. The unit focused on monitoring misinformation, rapidly responding by disseminating accurate information, and evaluating the need for ongoing responses to misinformation. The team consisted of a medical director, two program specialists with bilingual capabilities, and a director of policy and planning (J.K., M.P.-G., I.G.U., and J.J., respectively), who launched this effort as part of their pandemic response duties and spent up to 50% of their time on this project. The Health Department also relied on more than a dozen qualitative research, communications, and community engagement staff dedicated to the Covid-19 vaccine campaign. The Health Department convened these internal stakeholders in a weekly interdisciplinary Misinformation Working Group.

Pervasive fertility concerns and related misinformation demonstrated the need for an ongoing, multifaceted, community-based response. In the early months of the Covid-19 vaccination campaign in February 2021, the Misinformation Response Unit identified social media posts claiming that Covid-19 vaccines cause infertility, spread mainly through the accounts of anti-vaxxers. This early detection was brought to our weekly working group meeting, encouraging our communications team and reproductive health specialists to collaborate. They pulled together talking points, a public service announcement video,[10] and external resources[11] addressing reproductive health concerns and disseminated them to community engagement staff, medical providers, and trusted messengers such as the Health Department's doula network.

Our efforts focused on both disinformation, defined as deliberately created and disseminated falsehoods, and misinformation, which is unintentional but can be just as harmful.[12]

Misinformation and disinformation are both more likely to spread in the setting of data deficits, when "people can't easily access reliable information … [and] mistrust in actors and institutions related to vaccines is high."[13,14] During the Covid-19 pandemic, the Health Department recognized that this harmful lack of access to accurate health information was exacerbated by language and cultural differences, lack of reputable messengers, and use of informal information channels.

> *"Faith-based leaders reported that congregants asked worried questions about fetal cells in vaccines, while community groups highlighted pervasive misunderstandings of vaccine side effects."*

Addressing the impact of misinformation and disinformation on vaccine equity was a key goal. The Misinformation Response Unit was activated as part of the Health Department's Covid-19 Vaccine Operations Center's Equity Team, which focused on improving vaccine confidence and community-based messaging in communities of color and other groups.[15] Research has shown that misinformation is disproportionately targeted toward communities of color and more likely to take root in communities with institutional distrust due to experiences of discrimination and disinvestment.[16,17]

The Misinformation Response Unit used the framework of "infodemic" surveillance," which describes how, "similar to surveillance in pandemics we want to be able to detect outbreaks of misinformation, rumors, falsehoods, to counter them with facts or other interventions."[18] We also applied the concept of "infodemiologists" — "community-based vaccine champions" trained "in effective communication methods."[3]

Misinformation Surveillance

The Misinformation Response Unit created a system to closely track national social media and news media misinformation trends, leaning heavily on scans put together by external think tanks and analytic groups (Table 1). It also relied on input from a robust network of NYC community partners, as well as scans of NYC-based social media accounts. This approach

Table 1. NYC Department of Health and Mental Hygiene's Misinformation Surveillance Sources

• Public health industry reports*
• National and local news and social media scans
• Reports from community and faith-based organization partners
• NYC Covid Test and Trace Community Advisory Board feedback
• NYC Health Opinion Poll and other community surveys
• Focus group interviews within specific community engagement programs
• Health care provider roundtable and ongoing outreach
• City agency staff town hall
• NYC Department of Health and Mental Hygiene Vaccine Champion staff meetings

NYC = New York City. The Department of Health and Mental Hygiene tracked Covid-19 misinformation using a wide variety of sources. *Centers for Disease Control and Prevention Vaccine Insights, Project VCTR (Vaccine Communication Tracking and Response), The Virality Project, Kaiser Family Foundation Monthly Survey, First Draft News, El Detector, Factchequeado, Aos Fatos, and El Centro Latinoamericano de Investigación Periodística. Source: The authors

required continuously updating local data sources. Our methodology aligns with the Centers for Disease Control and Prevention's (CDC) new Social Listening and Monitoring guide, which suggests monitoring not just what misinformation is spreading, but also what questions are being asked by the community and how attitudes and emotions are affecting health decisions.[19]

A major element of this surveillance work was monitoring non-English and non-U.S. information. The Misinformation Response Unit identified early on that a large proportion of immigrant New Yorkers had exposure to non-English social media and non-U.S. news media. Relying on multilingual staff, we expanded our tracking of Spanish-language social media and other global sources. The unit staff reviewed reports put together by Project VCTR (Vaccine Communication Tracking and Response) and Spanish-language organizations such as El Detector, Factchequeado, Aos Fatos, and El Centro Latinoamericano de Investigación Periodística; their findings were validated with our community group liaisons during the working group sessions.

We further incorporated a global perspective by identifying trends circulating in other parts of the world from which many immigrants have come to NYC, including Latin America, China, and Russia.[20] We requested that our social media monitoring vendor, GroupSense, focus on global sources, and we commissioned deep dives into specific languages and community settings. We also collaborated with community groups such as those serving Russian-speaking communities in South Brooklyn, Yiddish-speaking Haredi Jewish communities in Brooklyn, and African immigrant communities in the Bronx. Our aim was to understand how information was spreading in their communities and what misinformation was catching on. These efforts led us to create tailored messaging strategies; for example, creating a Haredi-focused pamphlet, increasing our engagement with Russian-language television in Brooklyn, and hosting town halls with Caribbean immigrant groups. This multifaceted, global monitoring continues to be a key need because non-English sources are underrepresented in the scans of misinformation conducted by national partners. These sources also are more likely to evade content-monitoring efforts by social media platforms.[21]

Misinformation identified by the Misinformation Response Unit's surveillance program was classified into eight themes, with safety, side effects, trust, and conspiracy the most common themes, mirroring what is seen in the literature.[22] Recurrent findings included claims of ivermectin as an alternative to vaccines, concerns about vaccine side effects such as infertility, and conspiracy theories about vaccines such as microchips and population control.

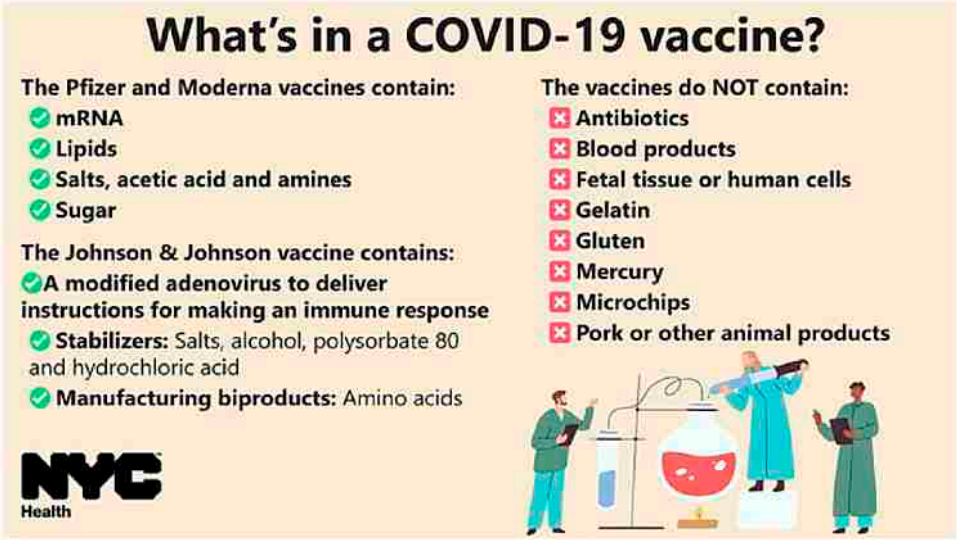
> *"A major element of this surveillance work was monitoring non-English and non-U.S. information. The Misinformation Response Unit identified early on that a large proportion of immigrant New Yorkers had exposure to non-English social media and non-U.S. news media."*

As a key example of our surveillance infrastructure, the Health Department identified early on that microchip conspiracy theories and vaccine ingredient worries were becoming entrenched in

FIGURE 1

Sample Infographic

This later version of a New York City (NYC) Department of Health and Mental Hygiene Covid-19 vaccine infographic included talking points not just about what is in the Covid-19 vaccines, but also what is not, such as microchips and fetal cells.



mRNA = messenger ribonucleic acid.
Source: New York City Department of Health and Mental Hygiene
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multiple communities with low vaccination rates and distrust of the medical system. Alerted to this trend, our communications department quickly expanded our talking points on which we trained community partners and developed multimodal materials to address our concerns (Figure 1), all with a focus on trust and transparency. We continued to monitor for these concerns, particularly through community forums, health care providers, and group staff interviews, to further refine our response and pinpoint specific vaccine-ingredient concerns that arose.

Responding to Misinformation

To effectively combat misinformation, the Misinformation Response Unit joined in broader Health Department efforts to build vaccine confidence. In addition to traditional public health media campaigns, the Health Department developed relationships with more than 100 community-based organizations as part of its Covid-19 vaccine campaign.[23] These groups were key partners in rapidly disseminating accurate, culturally tailored information through leaders and representatives trusted by local communities.

To support these partners, the Misinformation Response Unit facilitated early, sustained, and coordinated messaging from multiple and trusted messengers — ideally before the misinformation became widespread.[24] We provided them with insight into key misinformation

trends occurring in specific communities; suggested effective messaging to counter it; and convened stakeholders to deploy a coordinated response focused on the timely dissemination of accurate, culturally tailored information through trusted messengers.

Feedback on Health Department messaging, including our Health Opinion Poll and other sources, suggested that the rapid dissemination of talking points and materials helped build trust at the community level and mitigate the impact of circulating disinformation. Our communications office reflected on the positive impact of their question-and-answer communication strategy — the "trusted talking points" went out to 300 people every day in city agencies and community-based organizations. "We learned quickly that having one set of information that people could trust and know was most current was really vital," one staffer said. Community engagement staff echoed the importance of information and data sharing at the community level. "People are just so engaged and mind-blown by the information on our website," another staffer said.[25]

Despite this strategy, ongoing surveillance showed that misinformation about vaccines and infertility continued to spread. By summer 2021, reproductive health concerns were a leading cause of vaccine hesitancy among both women and men, according to national surveys (Kaiser Family Foundation Vaccine Monitor) as well as local feedback (e.g., focus groups of NYC-based nursing home staff and reports from community partners). This situation led our communications team to develop additional tailored messaging, including a handout on Covid-19 vaccines and reproductive health,[25] a vaccine champion training for congregate-setting staff, and an evidence brief on Covid-19 vaccine safety created in collaboration with the Jewish Orthodox Women's Medical Association. This last brief was shared through NYC-based Haredi Jewish social media channels in February 2022 and generated positive community and provider feedback.[26] NYC nursing home leadership and health care providers also found our reproductive health materials helpful in debunking fertility concerns.

In line with public health best practices, the Health Department generally avoided repeating misinformation in these messaging pieces. However, when fertility concerns and other misinformation claims became so widespread, we determined it would be more harmful to let them continue unchecked than to respond directly. In such cases, we used strategies such as the "truth sandwich," or reframing misinformation items to highlight the correct information.[27,28] One example was the Health Department's multimedia "True/False" myth-debunking campaign in fall 2021.[29] Another was a later campaign called "You're Right, You Should Know," which directly addressed several circulating myths about the vaccines' supposed ineffectiveness and lack of safety, natural remedies to Covid-19, and the claim that prior Covid-19 infection provides sufficient protection against future infections.[30]

"*Feedback on Health Department messaging, including our Health Opinion Poll and other sources, suggested that the rapid dissemination of talking points and materials helped build trust at the community level and mitigate the impact of circulating disinformation."*

In unusual cases, a rapid response (1–2 days) was required to address flare-ups of misinformation, particularly if there were legal or safety concerns. Examples included the identification of a flyer falsely claiming to be an NYC Police Department bulletin warning against the distribution of N95 masks; an antivaccine flyer posted in Brooklyn neighborhoods targeting Haredi Jewish communities; and disruptive antivaccination protesters at a community event staffed by the Health Department. In these instances, the Misinformation Response Unit immediately escalated the concern to Health Department Communications and Community Engagement leadership and called for a rapid response, including the involvement of other city agencies and partners. For example, the NYC Police Department was asked to coordinate a response to the fake police bulletin by their media team, while community groups helped find and remove flyers.

Evaluation of Misinformation Monitoring and Response Efforts

To assess the impact of our work, we gathered feedback on Health Department communication campaigns, solicited input from Health Department staff and community partners, and monitored misinformation trends over time. We also undertook formal qualitative interviews of Health Department staff in April 2022 in response to the Surgeon General's Request for Information.

We originally sought to undertake a more quantitative analysis. However, the fluid and diffuse nature of the misinformation spread made it challenging to measure the rate or amount of misinformation being disseminated in specific communities, the number of people affected over time, or the direct impact on vaccination rates.

Feedback on communication efforts came from our Misinformation Working Group forums, community advisory boards, community town halls, and focus groups with community members. Our questions included: Do we understand underlying community concerns and data deficits driving the spread of misinformation, and are they being addressed? Are we adequately supporting community partners in their role as trusted messengers, particularly in communities with low institutional trust? Is misinformation affecting the Health Department's efforts to build health literacy, vaccine confidence, and institutional trust in the Health Department?

We used this feedback to rapidly adjust our approach, using a "Plan-Do-Study-Act" quality improvement model. For example, we confirmed that community organizations were eager for more support in tackling misinformation, and we focused on communication materials that could be most impactful. We found that these organizations liked to disseminate infographics and personal stories on social media and that these materials were helpful in "drowning out" disinformation spreading via videos and memes (Figure 2A, Figure 2B). Our communications team responded by making our existing materials more accessible and increasing the use of storytelling videos.[31,32] This work helped the Health Department make the most of limited resources, improve collaboration with local groups, and plug gaps in our communication strategy.

Through staff feedback, we found that staff appreciated our alerts of early circulating misinformation because it helped them prepare and monitor its spread. They requested additional reviews of fast-changing factual information on the vaccine to help their frontline

FIGURE 2A

Sample Social Media Materials Created by the Department of Health and Mental Hygiene Communications Team

A New York family of Caribbean descent shares their personal story in the Garifuna language of choosing to receive the Covid-19 vaccine.

Source: New York City Department of Health and Mental Hygiene

staff feel confident in debunking misinformation in real time, as well as targeted training on countering misinformation and building trust. The need was shared by multiple programs, from our "Key to NYC" business inspectors and Public Health Detailing team to our community organization liaisons and youth outreach group. In response, we helped develop specific materials around "how to talk to friends and family about vaccines" and a Vaccine Champion toolkit. By training staff in misinformation response best practices, our interviews suggested that we could help reduce burnout and frustration among frontline staff who were confronted daily with misinformation.

> *"Misinformation around vaccine ingredients, safety for people with chronic conditions such as asthma and HIV, and the use of ivermectin could be balanced by clear facts and data. Conversely, misinformation around fertility concerns was harder to address due to reluctance by the CDC and national organizations to issue definitive statements until robust studies had been completed."*

Finally, our misinformation monitoring helped identify which misinformation would be more challenging to counter. Misinformation around vaccine ingredients, safety for people with chronic conditions such as asthma and HIV, and the use of ivermectin could be balanced by clear facts and data. Conversely, misinformation around fertility concerns was harder to address due to reluctance by the CDC and national organizations to issue definitive statements on vaccine safety for pregnant women until robust studies had been completed. Their nuanced statements were

FIGURE 2B

Sample Social Media Materials Created by the Department of Health and Mental Hygiene Communications Team

An infographic highlighting a Latina New Yorker's personal choice to receive the Covid-19 vaccine while pregnant addressed fertility concerns.

Source: New York City Department of Health and Mental Hygiene

often no match for blunt disinformation. This situation taught us to be transparent with the public about what we do not know, rather than to stay silent in the face of heightened community concern. Misinformation around vaccine safety was also pervasive due to the ability of bad actors to manipulate complex topics, such as the national Vaccine Adverse Event Reporting System database and pharmaceutical company reports. Addressing this disinformation required more nuanced messaging and a focus on health literacy building, especially related to vaccine development and safeguards.

Other Approaches to Curbing Misinformation

Although making progress through traditional media and community engagement, the Health Department had limited ability to curb misinformation on social media. We developed alternative

strategies to broaden our impact. In 2021, the NYC Health Commissioner published a letter to major social media companies calling for broader efforts to curtail deliberate disinformation, particularly from the most notorious spreaders of disinformation and from non-English language sources.[33,34] The Health Department also engaged with the Public Good Projects,[35] a national health literacy organization, to mobilize social media microinfluencers to disseminate pro-vaccine messaging in NYC as well as train community-based organization partners to develop effective social media campaigns. Finally, the Health Department partnered with community media groups such as BRIC Arts Media and the New York Latino Film Festival to craft culturally appropriate, multilanguage-tailored videos and print ads that resonated with communities and addressed broad misinformation themes.

Lessons Learned

The Covid-19 public health emergency has made clear that responding to misinformation is a core function for public health. Robust response is essential to reducing the detrimental impact of misinformation on health equity and community well-being. The Misinformation Response Unit, initially developed for the NYC Covid-19 vaccination campaign, has now been incorporated into the NYC Health Department's permanent communications and epidemiology infrastructure. We continue to tackle misinformation through the lens of health equity, trust-building, and community engagement. Our experience can serve as a road map for other health departments and systems in combating misinformation in future health crises.

The NYC Health Department and other health departments and systems can build on the multitude of reports published by the CDC and other monitoring groups, as well as proprietary social media monitoring services. We recommend dedicating additional resources to tracking the spread of misinformation at the community level — including from non-English and international sources — and maintaining a focus on community concerns. Various social listening toolkits have recently been published and can be used to guide this work.

The importance of building strong relationships with community partners, from community-based organizations to employers to medical associations, cannot be overstated. We encourage health departments and health care providers to collaborate with community groups that can prioritize local perspectives, tailor health messaging, and offer feedback on how those messages are received in the community. Community partners are essential for implementing proactive strategies, such as positive storytelling from community members.

Finally, we emphasize the importance of continuously evaluating health misinformation response efforts to support rapid improvements and guide resource allocation. This is a nascent field of behavioral science research. The Health Department's evaluation efforts to date have been qualitative and interview based. We supported the Surgeon General's Request for Information to evaluate the impact of Covid-19 misinformation, and we call for additional behavioral science research into this important topic. Evaluations should be grounded in equity to ensure that the needs and concerns of disadvantaged communities are prioritized.

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