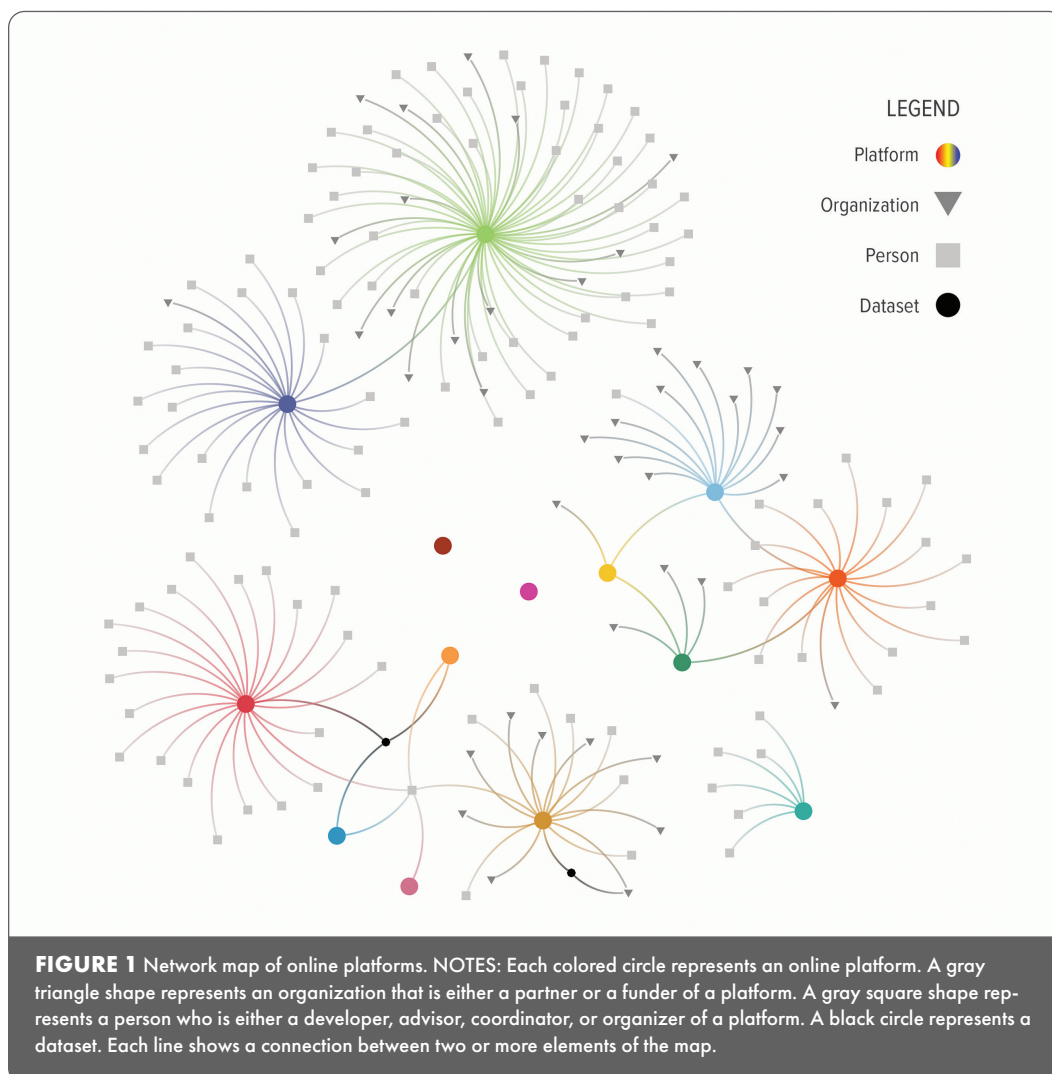# Mapping of Online Data-Sharing, Analysis, and Collaboration Platforms
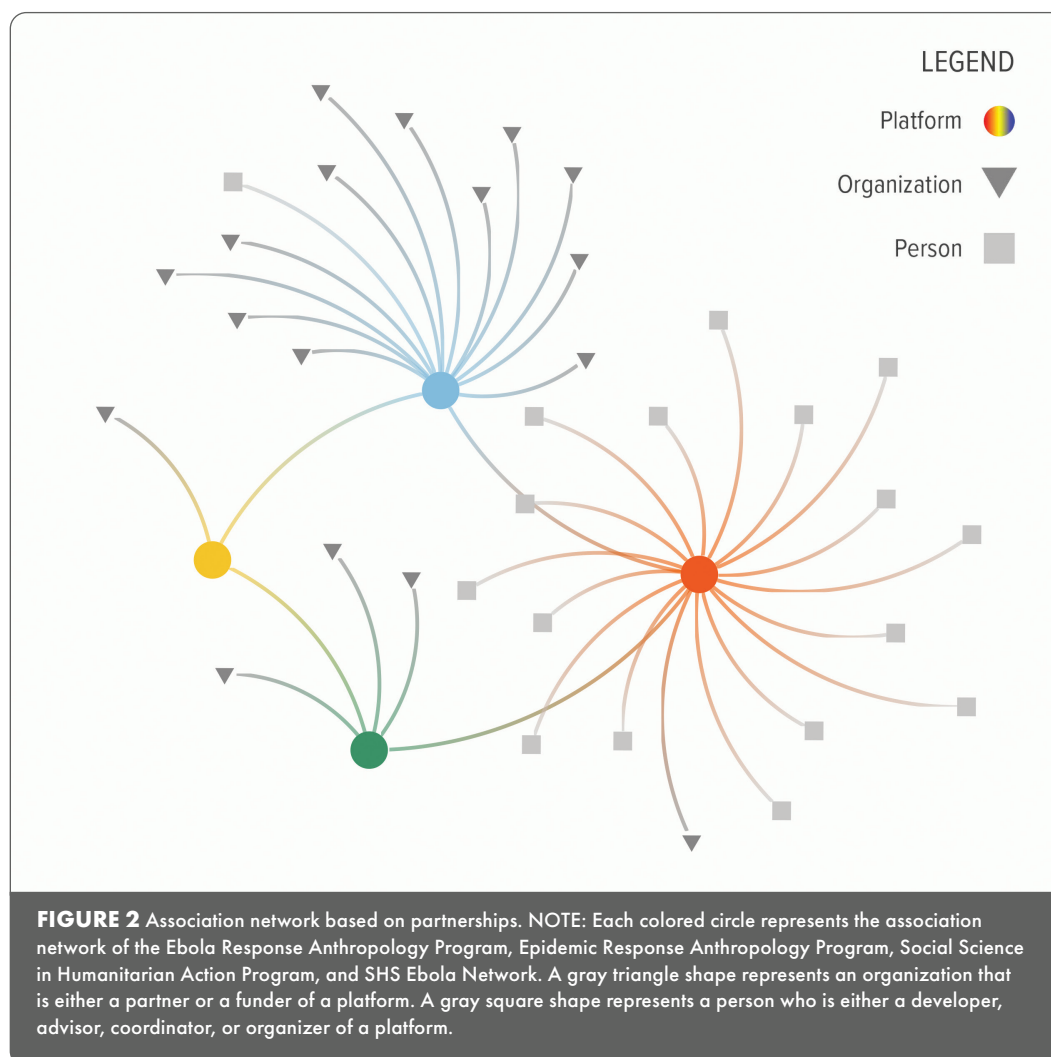
During the past several years, online platforms have been created by funding and scientific organizations and individual scientists to share data and scientific results, crowdsource analysis, and facilitate collaboration. Several of these platforms provided new opportunities for scientists to access information, work collaboratively to gain new insights, and/or challenge members to address outstanding scientific questions during the SARS-CoV-2 pandemic. The Committee on Addressing Inaccurate and Misleading Information about Biological Threats through Scientific Collaboration and Communication identified and evaluated platforms that include international scientists visualized in a network map (see Figure 1).

FIGURE 1 Network map of online platforms. NOTES: Each colored circle represents an online platform. A gray triangle shape represents an organization that is either a partner or a funder of a platform. A gray square shape represents a person who is either a developer, advisor, coordinator, or organizer of a platform. A black circle represents a dataset. Each line shows a connection between two or more elements of the map.
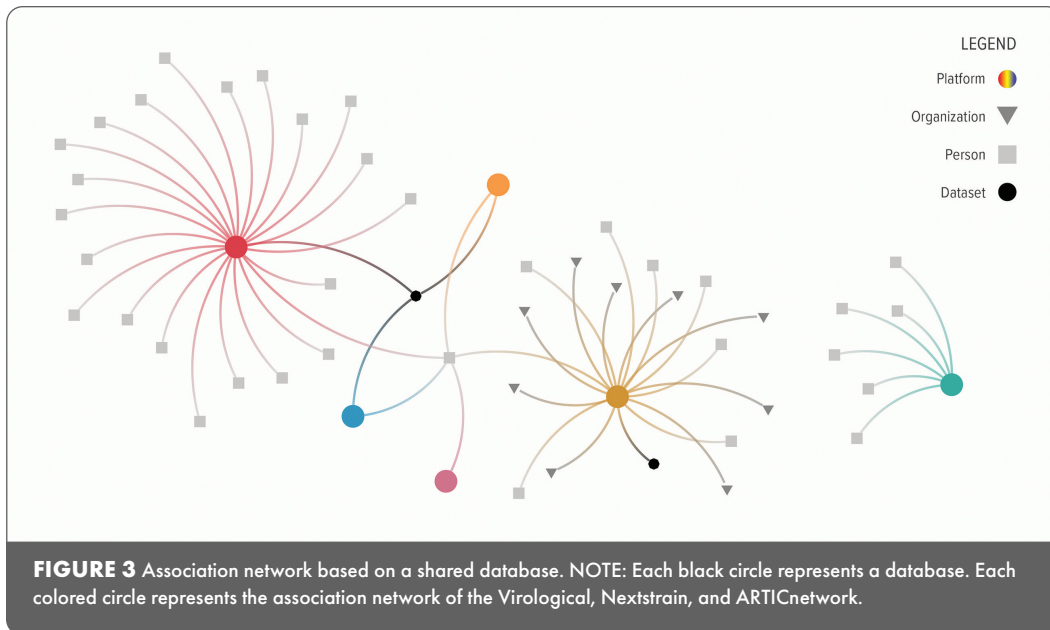
These platforms are as follows: Virological, Kaggle's COVID-19 Open Research Dataset, 3D Experience Lab, Open Access India, Open Access Week, Zenodo's Coronavirus Disease Research Community–COVID-19, Nextstrain, PreReview, Epidemic Response Anthropology Platform, Social Science in Humanitarian Action Platform, Ebola Response Action Platform, Sciences Humaines et Sociales sur Ebola (SHS Ebola) Network, Ebola Response Anthropology Platform, COVID-19 Genomics UK Consortium (COG-UK), and ARTICnetwork. Preprint servers such as bioRxiv and medRxiv, journals, scientific article aggregators such as PubMed, and open-access sites were not included in the network map because they are not platforms for collaboration and crowdsourced analysis. The network map analysis focuses specifically on those platforms that enable collaboration and/or crowdsourced analysis across geographic regions and scientific disciplines. For each platform, documented associations exist between the platform and publicly listed partners, funding sources, datasets, and people listed as developers, advisors, coordinators, or organizers of the virtual community. The data were visualized using the online, public network mapping resource, Kumu.[1]

The visualization of these platforms demonstrates that little interconnectivity between the online platforms was identified. Four groups of connections between platforms were identified. One group is the Ebola Response Anthropology Program, Epidemic Response Anthropology Program, Social Science in Humanitarian Action Program, and SHS Ebola Network, which demonstrated association through partnerships (see Figure 2). Another is Virological, Nextstrain, and ARTICnetwork—all of which use the same dataset (GISAID) (see Figure 3). One individual was associated with five platforms: COG-UK, Kaggle's COVID-19 Open Research Dataset, Nextstrain, Virological, and ARTICnetwork. Open Access India and Open Access Week are associated via partnership. No other apparent associations were identified between the other platforms.

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[1] See https://kumu.io.

FIGURE 2 Association network based on partnerships. NOTE: Each colored circle represents the association network of the Ebola Response Anthropology Program, Epidemic Response Anthropology Program, Social Science in Humanitarian Action Program, and SHS Ebola Network. A gray triangle shape represents an organization that is either a partner or a funder of a platform. A gray square shape represents a person who is either a developer, advisor, coordinator, or organizer of a platform.

FIGURE 3 Association network based on a shared database. NOTE: Each black circle represents a database. Each colored circle represents the association network of the Virological, Nextstrain, and ARTICnetwork.

A limitation of this analysis is its reliance on publicly described information. Platforms that do not provide or poorly describe information about partnerships, funders, leaders, members, datasets, and other relevant information limit this and any other analysis of interconnectivity of the platforms. Still, the current analysis suggests that partnerships between platforms may be a strong indicator of their association. This association may be leveraged to engage a diversity of scientists in addressing inaccurate and misleading information. Whether platforms that are associated through individuals or datasets also may be leveraged is unclear. Therefore, these types of visualizations help to understand which organizations may be particularly beneficial to engage.