

The World Needs a “Pandamic” Solution for a Pandemic Problem

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Two decades ago, the term “infodemic” was coined right after the Severe Acute Respiratory Syndrome (SARS) emerged (1). The World Health Organization (WHO) defined infodemic as “*too much information including false or misleading information in digital and physical environments during a disease outbreak.*” While fully realizing the negative impact of misinformation and disinformation during an epidemic, we argue that most epidemic related information was generated not as a result of bad intention, but as a result of haste, confusion and the lack of reliable information. This is especially true for coronavirus disease 2019 (COVID-19), the emergence of a novel virus and uncertainties surrounding variants and vaccines. With a lack of timely scientific evidence, it is reasonable and even recommended for global citizens to debate and voice skepticism on certain matters. Of the past 3 years of the COVID-19 pandemic, there was some degree of infodemic during the first year. As time progressed, citizens had wider access to a range of information and more matured judgement leading to quality information trumping in an infodemic.

Therefore, we propose not to simply and pejoratively label an infodemic as the over-abundance of false or detrimental information. Instead, we propose a 3-dimensional view of an infodemic: 1) genuine information of the epidemic, 2) false information by the epidemic, and 3) intelligent information for the epidemic. The 1st dimension refers to the narrow scope of objective information concerning the epidemic itself that usually has limited circulation within government agencies and public health authorities. The 2nd dimension refers to misinformation and disinformation that are by-products of the epidemic, usually resulting from non-professionals. The 3rd dimension refers to (big) data technologies and applications for fighting a pandemic.

To further stress the importance of the 3rd dimension, we propose a new term: “pandamic” (pan-da-mic). It is similar to “pandemic” in form but conveys a completely different meaning and tone. “Pan” could be interpreted as the literal meaning of a cooking pan or in the context of Darwin’s pangenesis

theory and the emerging concept of pan-genome invoking all of nature (2); “da” refers to data applications widely used and dearly needed to fight and prevent pandemics in the most meaningful sense; “mic” means microbiology and, in particular, various omics technologies. Therefore, “pandamic” stresses the deep fusion of bio-technology (wet) and info-technology (dry). Compared to “pandemic,” “pandamic” differs by one letter “a” which stands for applications. Without well-designed applications (APP), the smartphone that each of us relies on would instantaneously become a dummy. Therefore, the letter “a” used to replace letter “e” in “pandemic” is indeed powerful and meaningful.

Based on Wiktionary.org, “pandamic” is defined as “misspelling of pandemic,” which showed up in the title of an article published in April 2020. From now on, “pandamic” is not the misspelling of “pandemic” any more. Rather, it is a framework to address pandemic problems. We now added a new entry onto Wiktionary.org, and defined “pandamic” as “*a broad fusion (“pan”) of data applications (“da”) and microbiological research (“mic”), especially in the context of controlling and preventing pandemics.*” To facilitate the translation of this new term to other languages, we suggest the Chinese translation of “pandamic” to be “大生信” (dà shēng xìn). These three characters literally mean “big, biology, information” respectively. Interestingly, “信” also means trust. It emphasizes that information and trust should support each other. The Chinese translation for “pandamic” even rhymes with that for “pandemic” — “大流行” (dà liú xíng). Splitting “pandamic” into three widely used characters should provide a good reference for translating it into other languages using etymological approaches.

The onset of COVID-19 sparked a new wave of big data technologies to support the fight against a global pandemic. Additionally, the wave helped ensure global health security, from generating and sharing severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) genome data and tracking the pandemic in real-time to facilitating diagnosis and drug repurposing (3). The “mic” part of “pandamic” stresses the importance of fully studying invisible

microbes in addition to visible humans. This is in line with the One Health concept. Artificial intelligence (AI) based tools such as Alpha-Fold could be used to reliably predict the micro-structure of proteins (4), including the SARS-CoV-2–human interactome, to explore genetic and drug perturbations (5). Research along these lines could get to the bottom of how virus spike proteins grab human cell receptors more and more effectively as transmissible variants emerge. This 3-dimensional research is much more powerful than the traditional 1-dimensional phylogenetic research used to assign a Greek label (i.e., Delta and Omicron) for emerging variants without a deep dive into the biology.

Another promising microbiological application is a scalable solution for wastewater genomic surveillance that allows early detection of SARS-CoV-2 variants and identification of cryptic transmission (6–7). This is more hassle-free and cost-effective than conducting mass testing on millions of people daily. Under the dynamic zero-COVID policy, China has been able to mobilize resources to conduct mass nucleic acid testing of millions on a regular basis, but this is not viable or even imaginable in many other parts of the world. Isolating and detecting pathogens from the vast sewage system is akin to finding a needle in the ocean. We choose to do this, not because it is easy, but because it is necessary. Further upgrading the technology shall push microbiology research to a new level that can eventually deliver applicable solutions to make a difference towards a more secure global public health.

About 100 years ago, Charles-Edward Winslow defined public health as “*the science and art of preventing disease, prolonging life, and promoting health*” (8). About 80 years ago, “global health” first appeared in the literature as a scientific term. Koplan et al. defined global health as “*an area for study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide.*” This time, the keyword “practice” is added. Through COVID-19, we see that science and art are not enough. The world needs practical and applicable science and technologies that can work effectively on the ground. Major pandemics in the 21st century brought the concept and global awareness of “One Health” (9). The introduction of “pandemic” comes timely and fits nicely into “One Health.” After all, we propose “mic” in “pandemic” to represent “microbiology,” which is a key component of One Health. Throughout the COVID-19 pandemic, the “da” part of “pandemic” has been highly visible, with

data applications on both personal level and international stage. Examples of efforts include the building of a global hub for pandemic and epidemic intelligence with modern approaches to surveillance and risk assessment (10).

The COVID-19 pandemic is devastating, but it is now time to rethink positively and rebuild prospectively. Rephrasing “pandemic” to “pandamic” is not only a letter change, but hopefully a change of our mentality to be ready for future pandemics.

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