

Conclusion

Numbers, Experts, and Policy-Making

The COVID-19 crisis and the resulting daily flood of models, graphs, and tables have shown how numbers – and the ways in which we visualize numbers – have grown ever more dominant since the period covered in this book. In many countries, political leaders and media outlets put forward the image of a COVID response “production line” in which statistics were automatically fed into policy-making via modeling: numbers fed into models, which produced prognostics, which then dictated policies. Some governments even cited the virus’s basic reproduction number (R_0) when justifying their response policies. This reliance on models in policy-making has led many researchers to voice concerns about the necessarily simplistic nature of such models.¹

And yet governments, despite experiencing similar transmission curves over time, undertook a large variety of different response measures: ordering the closure of different types of public establishments, for example, and enforcing different lengths of quarantine. This revealed the important role retained by policy-makers in interpreting the numbers. Policy-makers certainly continued to have leverage when it came to decision-making during the pandemic.² The French president, Emmanuel Macron, for example, went within a year from stressing the scientific nature of his decisions to calling the models – and hence the scientists – wrong. When facing increasing cases, policy-makers’ discourse also differed: Donald Trump, then the United States president, more than once blamed the high number of cases in the country on increased testing. Is it really true that there was an over-reliance on models, and that numbers were fed directly into policy-making? Or was this reliance magnified in part by communication strategies aimed at making policy-making

¹ Warwick Anderson, “The Model Crisis, or How to Have Critical Promiscuity in the Time of Covid-19,” *Social Studies of Science* 51, no. 2 (2021), 167–88.

² Sabina Leonelli, “Data Science in Times of Pan(Dem)ic,” *Harvard Data Science Review*, no. 3.1 (2021), 3.

“conceivable” and at “depoliticizing” the debate, as Warwick Anderson has suggested?³

It will be up to future historians to assess how wide a gap existed between numbers and policies during the pandemic, and the true role played by experts in the policy-making process. The “number culture” in global health governance, made all the more evident by the COVID-19 crisis, did not arise in a vacuum; this book recounts the budding of that very culture by tracing the historical process by which public health actors at different levels and in different places learned to speak the language of statistics, a language they used to grasp health conditions in distant parts of the world, consolidate authority in matters of global health, and increase trust in their policies.

A historical, transnational network of public health experts laid the foundation for the trust in numbers that characterizes international health governance today. Underlying that network was a political context that has always been crucial to the success or failure of statistical collection. The League of Nations had to tread carefully when it sent an expert to tour Asian colonies; the United Nations Relief and Rehabilitation Administration depended on cooperation from the Allied countries; the young World Health Organization (WHO) collaborated with the United States, which aimed to make the organization an all-encompassing clearing house for statistics; and in China and Taiwan, public health statistics were driven in different directions as the two competing regimes sided with different camps in the Cold War.

Another hurdle faced by this global network of statisticians was the heterogeneity of the territories involved. Whereas interwar statisticians from North Atlantic countries were entrusted with standard-making, those from other regions were involved only at a later stage: learning pre-formulated standards and using them to collect numbers. The United Nations’ ever-expanding membership eventually incited the WHO’s statisticians to take local knowledge into account by including statisticians from different regions at an earlier stage of standard-making and by tailoring standards to local capacities. Nevertheless, the instructions for how to collect statistics in public health fieldwork were decided at the WHO headquarters in Geneva, while statisticians in the regional offices assumed the main responsibility to help countries to implement the decisions; in-country experts again found themselves relegated to a passive role, their contribution limited for the most part to reporting problems encountered in the field. Although local knowledge was integrated into

³ Anderson, “The Model Crisis,” 177.

the global statistical reporting system, once that system was established, quantification ended up sidelining local knowledge.⁴

This was not yet completely the case in the period studied here. Most of the actors discussed in this book boasted varied skill sets. They had mastered biostatistics in addition to having expertise in public health issues and the technologies and measures for tackling them, as well as on-the-ground knowledge of the field. This was true even of experts from outside the global health policy-making centers: they were skilled at adapting statistical practices using their local knowledge and the resources at hand. Interwar Chinese experts, for example, adapted statistical systems to the Chinese context and were fluent in reporting numbers when needed. Postwar Taiwanese experts, too, trained fieldworkers to understand the importance of numbers in directing policy decisions; they published the numbers they collected in academic journals, provided field data to support the WHO's policy statements, and took part in WHO meetings, bringing Taiwanese experiences to the table. Although statisticians in the People's Republic of China (PRC) turned away from the WHO and mathematical statistics during this period, the Communist regime nonetheless continued to rely on numbers. Public health experts in the PRC continued to conduct fieldwork-based research that used the logic of sampling from mathematical statistics, despite it being a form of reasoning that socialist statisticians opposed.

Given these diverse practices, to what extent did statistics really serve as a world language of public health that experts from different organizations used to communicate with one another? This book has explored the narrowing distance that separated statistics from policy-making, and the evolving roles of experts (and their knowledge of the field). During the period under study, statistics were gaining ground, and unquantifiable forms of knowledge were becoming marginalized in the process. Whereas interwar experts would use statistical practices at the start of their programs, their individual knowledge still had authority vis-à-vis their sponsors, regardless of the numbers collected. Their postwar colleagues, on the other hand, were forced to engage with and interpret statistics in their policy statements. Nevertheless, while statistics became indispensable in policy-making and communication, postwar experts continued to play an essential role in making sense of the numbers and turning them into policy. The distance between numbers and

⁴ Merry, *The Seductions of Quantification*, 6–7. More recently, Seye Abimbola has written a poignant editorial calling for the inclusion of local-specific knowledge in knowledge production for global health (Seye Abimbola, "The Uses of Knowledge in Global Health," *BMJ Global Health* 6, no. 4 (2021): 1–7).

policy-making was narrowing, but experts (and their knowledge) were still the linchpins at both ends.

The quantification of health has accelerated on many fronts since 1960. The first and most significant change has been that health economists systematically factor the national economy into health policy-making, a calculation that still dictates most governments' allocation of resources. Two trends paved the way for this change. First, health economics emerged as a discipline, accelerating what historian Michelle Murphy calls "the economization of life."⁵ Second, during the neoliberal turn in the 1980s, when countries cut government spending, the WHO experienced a budget crisis, and the World Bank gradually replaced it as the leading financier of health projects at the international level. The World Bank emphasized the need for public health projects to produce an economic return, contributing to what anthropologist Vincanne Adams calls "audit culture," in which quantification and numbers are crucial to devising, monitoring, and assessing health policies.⁶

The economization of life became even more pervasive in policy-making with the rise of indexes.⁷ A case in point is the disability-adjusted life year (DALY) index, which was endorsed by the World Bank in 1993 to serve as the basic indicator of health policy design. Discussions of the DALY index have illustrated the dominance, and limits, of health indexes.⁸ Devised by the Institute for Health Metrics and Evaluation at the University of Washington, the DALY makes commensurate years of life lost due to fatal disease or injury with years of life lived with a disability. The DALY index rates diseases based on statistical records of how much they reduce the number of disability-free lives as well as life expectancy within a population. Based on this approach, a disease's level of emergency is not based on the number of deaths it causes but on how many disability-free years of life it costs. Younger lives thus count more.⁹ Over almost three decades of its existence, the DALY has become a predominant index for public health policy-makers at both the international and national levels. Tellingly, in 2020 alone, eighteen articles were published on PubMed that calculated the burden of COVID-19 using the DALY.

⁵ Murphy, *The Economization of Life*.

⁶ Adams, *Metrics: What Counts in Global Health*.

⁷ Indicators involve yet another set of dynamics in policy-making, on which sociologists and anthropologists have conducted in-depth analysis. See, e.g.: Davis, Fisher, Kingsbury, and Merry, *Governance by Indicators*; Merry, *The Seductions of Quantification*.

⁸ Jon Cohen, "A Controversial Close-Up of Humanity's Health," *Science* 338, no. 6113 (2012): 1414.

⁹ Without citing the DALY, the same rationale was also used in Italian hospitals when deciding which COVID-19 patients should receive treatment using a ventilator.

Despite its sweeping influence, little attention has been paid to the fact that the creation of the DALY involved a number of experts and astute stakeholders. Since 1993, many have sought either to change the DALY's formulae or to include databases to draw attention to health problems in which they are interested.¹⁰ The index has become central to public health policy-making despite raising considerable controversy. It is yet another case in which a deep trust in quantification has played an important role in today's global health goal-setting and policy-making. The controversy surrounding the DALY demonstrates the importance of studying the historical process by which health is quantified.¹¹ It is equally important to investigate how economic thinking and public health interact in real-life policy-making. Specifically, how did economics impact the ways in which health organizations perceived their programs when health affairs were integrated into the national economy? Are the numbers being collected directly linked to policy-making? What roles are played by experts in interpreting data? These are essential questions if we are to understand international health programming since the 1960s.

Recent growth in data-set size and computing capacity, producing what is known as Big Data, is another critical aspect that impacts our lives in numbers.¹² People have come to accept the collection and calculation of numbers in more and more areas of modern life. This includes epidemiology: as the number and types of communication devices and electronic medical equipment have exploded, data on the health conditions of their users are now stored digitally, ready for analysis.¹³ "Infoveillance," epidemiological surveillance based on syndromic data posted online, has become an indispensable method for studying the recent epidemics of Zika virus disease and COVID-19, among others.¹⁴ Apart from infoveillance, Big Data technologies have grown so pervasive that research on COVID-19 includes aspects that range from modeling to the identification of social and environmental needs, as Sabina Leonelli has

¹⁰ Cohen, "A Controversial Close-Up of Humanity's Health," 1415–16.

¹¹ George Weisz and Noemi Tousignant have studied the historical context of the beginning of the DALY. See, e.g.: George Weisz and Noemi Tousignant, "International Health Research and the Emergence of Global Health in the Late Twentieth Century," *Bulletin of the History of Medicine* 93, no. 3 (2019): 365–400.

¹² For a historical investigation into the phenomena of Big Data, see: Elena Aronova, Christine von Oertzen, and David Sepkoski, "Introduction: Historicizing Big Data," *Osiris* 32, no. 1 (2017): 1–17.

¹³ Marcel Salathé et al., "Digital Epidemiology," *PLoS Computational Biology* 8, no. 7 (2012): 1–5.

¹⁴ On the Zika virus disease epidemic, see: Effy Vayena et al., "Policy Implications of Big Data in the Health Sector," *Bulletin of the World Health Organization* 96, no. 1 (2018): 66–8.

identified.¹⁵ At the same time, the surveillance of health conditions has also drifted away from the holistic ideal of “complete physical, mental, and social well-being,” as defined by the WHO,¹⁶ and is increasingly based upon atomized bodily data, such as heart rate and blood pressure. And statistics are no longer just in the hands of experts; ordinary individuals can also monitor and adjust their lifestyles using quantified data.

As quantification has become pervasive, aspects that cannot be quantified have lost their visibility. To this day, geographical inequality in data has persisted, if not worsened. Data is being generated at an explosive rate in wealthy countries, but the WHO is still struggling to collect statistics in regions with weak public health services. The Ebola crisis in 2013 demonstrated the lack of reliable epidemic statistics reporting in some regions, a deficiency that delayed and hindered relief work.¹⁷ The rise of an “audit culture” had created a blind spot in global health policy-making: territories that do not produce sufficient statistics are relegated to a secondary position, as they do not have the reliable quantified data required for putting forward a convincing argument for obtaining funding from international organizations.

As statistics penetrate all aspects of health policy-making, fully understanding the implications of public health numbers, indexes, and models has become an urgent issue. Only by disentangling the methodological presumptions behind statistical collection and examining reporting procedures in detail can global public health policies be decoupled from the rationale of economic returns, and the policy-making process be made truly transparent. And only by opening the black box of data can we use numbers in a well-informed way when devising global health policy.

¹⁵ Leonelli, “Data Science in Times of Pan(Dem)ic.”

¹⁶ International Health Conference, “The Constitution of the World Health Organization,” 1946. www.who.int/about/governance/constitution.

¹⁷ Suerie Moon et al., “Will Ebola Change the Game? Ten Essential Reforms before the next Pandemic. The Report of the Harvard-LSHTM Independent Panel on the Global Response to Ebola,” *The Lancet* 386, no. 10009 (2015): 2204–21.