

**Contagion:
Between Property and the Commons in
the WHO's Global Influenza Surveillance Network**

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[A bit of context for the pages that follow: I'm about to undertake some in-depth field research on the scientific network described below. One important dimension of that project will consider what this case study can help us understand about what makes commons-based production of science work and fail, and in particular what happens when commons-based production systems butt up against property-based production systems. Because any conclusions will have to await the interviews and archival research that I'll be doing, what follows is an attempt to defend this context as an interesting one in which to ask questions about the commons, and to define some of the important questions that we should be asking when studying a science or cultural commons. I also offer some initial thoughts on what the case study might show us, but these are quite provisional. Given the very early stage of the project, I particularly look forward to your reactions.]

For more than sixty years, the World Health Organization's Global Influenza Surveillance Network has provided the backbone of global efforts to combat seasonal and pandemic flu. The "GISN," as it is called, has two main tasks. The first is global influenza surveillance. By collecting epidemiological data and virus samples from more than 100 countries and 175,000 patients each year, the network is able to track the degree of change in the virus's virulence and genetic makeup, and thereby provide early warning of future epidemics and pandemics.¹ The second task of the network is vaccine optimization. Since the early 1970s, scientists in the network have used the samples and data collected through the network to inform

¹ See WHO Global Influenza Surveillance Network, <http://www.who.int/csr/disease/influenza/surveillance/en/>.

the choice of strains that each year are targeted by the trivalent vaccine, the one that we Americans are encouraged to receive each year, and that remains perhaps the single most important public health tool to combat influenza.

While little known, the GISN is of profound importance to global health. Although most of us think of the flu as an inconvenience, even the mild seasonal form causes substantial morbidity and mortality, for example killing an average of 38,000 people each year in the U.S. (mostly among the elderly).² Moreover, viral drift at times leads to particularly virulent new strains and thus to much more lethal pandemic outbreaks. In 1918-1920, an estimated 50 to 100 million people around the world – or about 3-6 percent of the world’s population, this time mostly young adults – were killed by the so-called “Spanish Flu.”³ A similar flu would kill 200 to 400 million people today. While there is little that the GISN can do to prevent dangerous mutations (which can occur at any time, and anywhere that animals, particularly birds and pigs, live in close contact with people), surveillance is key to limiting the impact of pandemic flu. An early warning can slow the spread of a virus, perhaps in very lucky cases even containing it within a particular country or region. Containment is more and more difficult given global patterns of travel and trade, but good surveillance can give sufficient time for an effective vaccine to be

² Thompson et al., Mortality Associated with Influenza and Respiratory Syncytial Virus in the United States, 289 JAMA 179, 185 (2003); Thompson et al., Influenza-Associated Hospitalizations in the United States, 292 JAMA 1333 (2004).

³ See, e.g., Patterson & Pyle, The Geography and Mortality of the 1918 influenza pandemic, 65 Bull. Hist. Med. 4 (1991).

produced, manufactured, and distributed, thus making the difference between a serious and truly catastrophic public health disaster.

The GISN is thus critical to our ability to track and react to the annual and pandemic risk associated with flu. As a highly successful, profoundly transnational network producing global scientific data and knowledge, it is also worthy of study in its own right. It has persisted for over sixty years, in that time dramatically expanding its geographic reach, adapting to changes in science, and weathering substantial changes to national and global legal regimes governing informational goods – all with remarkable success. Countries rely heavily on its recommendations when undertaking flu preparedness measures, and companies rely exclusively on its recommendation when formulating hundreds of millions of doses of flu vaccine each year. When well-matched to the prevailing strains, that vaccine reaches 90-100% efficacy for adult populations.⁴ Although some argue that the WHO reacted rashly to the 2009 swine flu outbreak, and its surveillance activities have been criticized as too slow at other times, there are also cases, such as the 1997 outbreak of avian flu in Hong Kong, where experts believe that the GISN may have helped to avert a global pandemic (in that case, by raising an early alarm that led to massive culling of affected poultry).⁵

⁴ The vaccine seems to have somewhat reduced efficacy for the elderly, although still in the realm of 60-70%. Its surprisingly hard to quantify vaccine efficacy here, in part because of the difficulty of doing a placebo controlled trial when the vaccine is the accepted standard of care for so many populations, and given the confounding issue of whether the vaccine is well-matched to the prevailing strains. There's much more nuance to be added to the story of vaccine efficacy, and much of the relevant data and references can be found here:

<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5908a1.htm>.

⁵ Scales 136.

Insiders consider the GISN one of the WHO's greatest successes,⁶ and it seems to have worked astonishingly well – until 2007. At that time, the global health community was on high alert, because a worrying new strain of avian influenza had emerged in Southeast Asia, with a fatality rate of as high as 80% among adults.⁷ The epicenter of the outbreak was Indonesia, and yet at this most critical moment for global health, Indonesia, which had been an active participant in the network since 1962,⁸ announced that it would no longer contribute to the WHO network until the WHO could guarantee more fair and transparent norms governing the network. This was the first time any country had taken such an action; the alarm in the global public health community was immediate and acute.⁹

The Indonesian Health Minister cited two main reasons for her decision. First, she had learned that an Australian company had obtained gene patents based on genetic material given by Indonesia to the GISN. And second, despite the increasingly acute flu situation in her country, she was unable obtain affordable vaccines and medicines.¹⁰ Prices were high and supplies very low, in part because wealthy countries concerned about a pandemic had snapped up the available supply.

⁶ Scales at 10.

⁷ Sedyaningsih et al., Towards Mutual Trust, Transparency and Equity in Virus Sharing Mechanism: The Avian Influenza Case of Indonesia, 37 Ann. Acad. Med. Singapore 482, 482 (2008).

⁸ Scales at 137.

⁹ Scales; Heymann; New Scientist; Holbrooke & Garrett.

¹⁰ Sedyaningsih et al.; Scales.

By refusing to cooperate with the GISN at a time of grave threat of pandemic flu, Indonesia threw the network into crisis, and was able to prompt a new multilateral negotiation over the framework governing the network. As became clear only once Indonesia refused further cooperation, the norms of sharing that characterized the GISN were developed almost entirely informally.¹¹ Indonesia's intervention precipitated the first formal negotiation about the norms that govern the network, which after five fraught years yielded, just this past April, a legal instrument that will govern the network. The framework is path-breaking in several respects. It mandates all companies who take samples from the GISN to contribute 10 percent of any resulting influenza vaccine or medicine to the WHO, for distribution in developing countries.¹² The obligation is to be enforced by a standard material transfer agreement, which will be governed by binding international arbitration. For the first time, too, companies will contribute to the cost of operation of the GISN, having agreed to pay 50% of its costs each year.¹³ Finally, national labs that receive samples from the GISN are forbidden from seeking IP rights on those samples.¹⁴ This resolution is in several senses unprecedented: it represents the only international legal obligation ever imposed upon companies to share their products with an international organization or developing countries, and

¹¹ For example, in defense of their position, the Indonesians seized on a page-long 2005 "guidance" document on best practices for the GISN that had been published on the WHO website. That document indicated that viruses would not be shared with companies without the informed consent of donor countries – although the network had for years done just that. The 2005 guidance document quickly disappeared from the WHO website, and was soon replaced with a guidance document that validated the then-existing practice of giving sample viruses to companies. See <http://www.twinside.org.sg/title2/avian.flu/news.stories/afns.003.htm>.

¹² Report of the Open-Ended Working Group of Member States on Pandemic influenza preparedness: sharing of influenza viruses and access to vaccines and other benefits, 64th World Health Assembly (May 5, 2011) A64/8.

¹³ *Id.*

¹⁴ *Id.* Art. 6.1.

a rare example of the pharmaceutical sector being required to contribute to the cost of what had previously been a publicly-funded public good. The binding arbitration feature gives the agreement unusual heft, and represents a significant shift in the governance of the GISN away from an informal, norms-based regime, to a formal and legalized regime.

The story of the recent GISN negotiations is important in its own right, with the Indonesians relying on the Convention on Biological Diversity to claim a form of “viral sovereignty” and the U.S. and Europe fiercely rejecting any incursion of property rhetoric that would have generated obligations for their pharmaceutical companies. That topic will be the subject of a parallel paper of mine, so for the moment, I want to set the dynamics and rhetoric of the negotiation aside, and focus on the GISN itself, as an example that can shed some light on the conditions of success, and failure, of a commons-based system of cultural or scientific production.

My aim in here is not to come to conclusions but rather to motivate and orient an inquiry into the nature of the GISN – into what has made it work and, for a time, fail – and to use this example to help us think about the kinds of questions we should be asking about the scientific or cultural commons more broadly.

So, what makes the GISN a good case study for those interested in the cultural commons? As a threshold matter, it seems to have many of the key features of a cultural commons. Though there is dispute about how precisely to define such a

commons, the GISN seems an uncontroversial example, because it is characterized by (1) a background commitment to voluntary and open sharing of assets (not without any restrictions, but rather with maximal sharing and/or public good, rather than, say, maximal profit as its goal); (2) a voluntary, collaborative, largely self-organized structure (while the WHO has been the home of the GISN, it is truly a network, governed until recently almost exclusively by the norms and agreements of the scientists and public health officials involved); and (3) it is supported and sustained not by property entitlements and revenues achieved by the sale of information goods, but rather by norms of cooperation, and funding cobbled together from a wide variety of sources, including in-kind donations from national labs and government funding to the WHO.

Strandburg, Frischmann, and Madison very helpfully lay out some of the key and distinctive questions raised by the phenomenon of the cultural commons, and I agree with much that they say in their formative article. As they make clear, the questions we should ask about the cultural commons are fundamentally about how investment and collaboration are sustained. These issues are clearly profiled by the GISN example, and in a particularly helpful way because it offers a story of both success and failure (helping counteract the tendency to study successes but not failures, or as social scientists say, to sample on the dependent variable).

The GISN is also an especially good case study, I think, because it helps us get at four questions in particular that we should focus on when we investigate the

scientific or knowledge commons. First, when we talk about a cultural commons we are often dealing with communities that are in no way geographically proximate to one another (Linux, Wikipedia, etc). This is interesting because of the important role that proximity and observability plays in Ostrom's early articulation of how communities can track and punish free riders, and thus make a natural resource commons sustainable. The GISN is a profoundly disaggregated network that is producing an important scientific good. Although there is no concern about overuse of this resource, the conventional Demsetz/Hardin model suggests that efforts to contribute could be subject to free rider problems. A country might perceive itself as best off if it could free-ride off the virus collection efforts of others, thus saving resources and avoiding unwanted scrutiny of outbreaks within their borders. As many as 25% of the over 100 national influenza centers that exist today do not send viable or timely samples to the network, yet this is generally perceived as a problem of capacity rather than will.¹⁵ This rate of non-cooperation also suggests a rather high rate of cooperation, i.e. 75%. And while some countries have clearly experienced very costly disruption of travel and trade as a result of epidemiological data supplied to the WHO,¹⁶ most countries continue to contribute such data to the influenza network. What explains this? Modern technology permits surveillance of the participation levels of this disaggregated group, but the GISN can marshal no punishment for shirking. Indeed, as Indonesia showed, countries are not even under a clear (soft) legal obligation to participate. How does the GISN function, without

¹⁵ Hampson S11-S12.

¹⁶ See e.g. Cash & Narasimhan, Impediments to Global Surveillance of Infectious Diseases. Bull. World Health Org (2000).

coercive structures to help overcome free-rider problems? The transnational dimension of the GISN is particularly relevant here, not only because it makes any coercive apparatus more complex, but also because it complicates the normative frameworks that might be mobilized in the absence of coercive power.

Second, while Ostrom's path-breaking work largely accepts the rational actor model of behavior (which posits that people are rationally self-interested, and interested primarily in material gain), work on the cultural commons – and here I am thinking particularly of Yochai Benkler and Wendy Gordon – sometimes questions the utility or accuracy of this assumption, at least where the production of cultural goods is concerned. Motivations like curiosity and community are often invoked, and a well-functioning cultural commons seems to require at least as much attention to how it can feed human desires for connection, creativity, and even fairness, as it does to how it can feed human desires for material gain. Here, the GISN is interesting because if we were to draw a scale of the ratio of private / public gain from an activity, with activities with very low private rewards but very high public gain on the left, the GISN would undoubtedly be far to the left. Many of the countries involved in GISN have received few tangible benefits over many years. This is particularly so for developing countries, which have long had little access to the vaccines and drugs that were the main tangible benefit of the network, and that anyway perceive themselves at relatively low risk for influenza, certainly as compared to other existing health challenges. Yet for decades, countries like Indonesia provided, without any direct compensation or real conditionality,

resources that were of enormous benefit to other countries, as well as to multinational pharmaceutical companies. While the scientists and health workers involved in GISN are typically compensated, they are in no way “incentivized” via the promise of a share of the social good that they create, in contrast to the vaccine companies to which they contribute critical information. Clearly, something other than incentives and direct material gain is involved in the sustenance of this commons. And in the recent renegotiation of the terms of GISN, and particularly the benefit sharing component, we can begin to deduce some of what may matter to sustaining the kind of cooperative contributions that make up the fabric of the regime.

Third – and this is a point that the triumvirate of Strandburg, Frischmann, and Madison make in a slightly different form – those governing a cultural commons often face important and pressing issues about how they want to interact with the intellectual property system. This is a particularly acute issue in the cultural context, because information builds on information. Whatever is produced in a cultural commons will be the raw material for future cultural production, and available for appropriation by those who use exclusive rights strategies down the line. The GISN again illustrates this nicely: it puts front and center the question of the relationship between the commons it created in virus surveillance and genetic resources, and the IP-driven system layered over top of it that produced the vaccines and drugs that were a primary aspect of the public health response. For many decades, GISN operated by treating the resources it collected as properly open

to all, and thus engaged in a kind of gift-giving relationship with the private sector.¹⁷ Is such an arrangement sustainable, or was the Indonesia crisis – a breakdown in gifting or collaborative norms, and a assertion of norms of proprietorship and market exchange – inevitable? The GISN example allows us to explore this interface between property and the commons, and all of the questions about the compatibility or corrosiveness of these two models that ensue.

Fourth, and finally, although many conversations about the cultural commons implicitly invoke the same values of efficiency and welfarism as do the Demsetz / Hardin account that they respond to, many of the conversations about commons-based cultural production seem to assume that other values matter too. So, for scholars like Lessig, part of the point of the Creative Commons isn't just the production of more stuff, or the efficient allocation of resources to inventive effort, but rather, promoting decentralized acts of cultural and political participation. But in my reading of the commons work, there is often an instability about whether this kind of participation is valuable in its own right (say, even if it undermines welfare, however measured), or whether it is valuable precisely because it promotes welfare. In the scientific context, it is less participation as a value, and more values of equity and fairness in the distribution of goods, that appears to compete with the value of efficiency. The GISN example is a productive one in this light because it allows us to ask the question of where values like sharing and equity fit in the conversation about the commons – whether such values are invoked merely in the service of the

¹⁷ Chan Chee Khoo, *Peace With Justice: Equitable Access to Pre-Pandemic Avian Flu Vaccine*, *Asian Bioethics Review* (2009).

instrumental efficiency of the commons, or whether those who invoke them seek to defend these values in their own right. The GISN framework agreement reached this last May arguably threads the needle, promoting both welfare (by keeping intact the surveillance network), and equity (by guaranteeing a minimum level of benefit sharing for resulting drugs and vaccines). But the debate around the framework may nonetheless allow us to ask, is there any meaningful way in which commons arrangements rely on or require a defense of values other than welfare, or are these other values invoked merely instrumentally, as the best means of maximizing welfare?

To condense these paragraphs into a series of questions about the GISN, then:

- 1) How was the GISN able to function as a commons, and motivate the widespread collection and sharing of virus samples, as well as production of epidemiological data and expert judgment, despite the conventional risk of free-riding, and the lack of any coercive power? Did scientific norms, institutional structures, less visible forms of compensation, or something else help sustain these cooperative practices?
- 2) What is the best way to model the actors involved in the GISN? Can a conventional rational-actor model encompass the motivations and reasoning

of those involved, and if not, how should our model of the participants in a commons shift?

- 3) How was the GISN affected by its interaction with evolving norms and laws governing property in information? Did the emergence of genome patents alter the structure or norms of the network in any way? Was the gift-oriented interface between the commons and private sector necessarily unstable, and what can the crisis and its resolution tell us about the delicate relationship between commons-based production and the IP system?
- 4) Finally, when we talk about the GISN, can we restrict our understanding of its aims and operation to norms of efficiency, or must we incorporate values such as equity or solidarity in order to understand what makes the network function, or succeed?

I hope to address these questions (as refined by our conversation, and the research itself) over the course of this project. But let me here offer a few very preliminary thoughts about the answers, to suggest some of what I think this case study may help us to see.

First, what made this diffuse, transnational network function for sixty-odd years, though it offers many participants relatively few benefits, contributes valuable resources to the private sector and (until recently) provided no share of

the benefits for many of the contributors – and all this without coercive mechanisms to control free rider problems? Understanding this likely requires disaggregating the network into its many parts (elite scientists, field-level healthcare workers, WHO employees, pharmaceutical executives, etc), and treating each part as distinct. It seems clear, even from the outside, that an ethos of scientific exchange and collaboration, as well as a commitment to the emerging concept of “global health” was important to the elite scientists and WHO officials who led the network. A closer analysis may help illuminate important aspects of this ethos, or a sense of how it evolved over time. It is also unclear how far “down” the hierarchy this ethos may have reached – were field workers also motivated by their participation in this scheme, or simply by the conventional requirements of a job and salary? If we consider countries as the relevant actors, in turn, why did the poorest, and even many middle-income countries, who for years saw few if any benefits of the network itself, willingly contribute? Some measure of an answer is likely found in the technical resources and training that WHO would provide to local labs, which countries may have perceived as valuable “capacity building.” Normative ideas about the value of cooperation for health, or norms and practices of reciprocity within the WHO may have also played a role.

One way to get at the question of the role of norms, and of the institution of the WHO, in facilitating cooperation, is to ask: if a private sector actor had tried to motivate the same contributions, would it have succeeded? So, if the small group of multinational vaccine companies had grouped together to coordinate virus sample

collection and sharing from more than 100 countries around the world, would they have been able to do so on these same terms? The WHO would seem to have several sizable advantages over private sector firms here. Some are infrastructural, such as representative regional offices and contacts, though these too may be revealing, because a public institution is likely in a better position to create and maintain this infrastructure than are private parties. WHO may also have played an important normative role. It seems unlikely that so many countries, particularly the poor ones, would have agreed to the kind of gift-relationship embodied in the GISN if it were governed solely by private entities. If this is correct, why is this so, and what might it tell us about the ability of public institutions to create the normative as well as institutional infrastructure needed for commons-based production, particularly on a global scale? Perhaps public institutions, for example, help to signal that norms of a commons rather than a market are in play. (Here, the work of psychologists who have shown that priming people to money generates more self-reliant behavior in experimental subjects, and also reduces willingness to volunteer labor or donate to a charitable cause, might be relevant to our thinking.)¹⁸

The GISN network seems less likely to disrupt a model of rational, welfare- or wealth-maximizing actors than other examples of the cultural commons (say, Wikipedia or mash up sites) that are more evidently in the zone of volunteering and play. Nonetheless, some inclination towards cooperation seems to be required to understand how a network of this breadth, with so few tangible returns or policing

¹⁸ Vohs, Mead & Goode, The Psychological Consequences of Money, 314 Science 1154, 1154 (2006).

tools, can thrive. The Indonesia crisis in fact supports this view, insofar as it suggests that a norm of what, in hindsight, looks like gift-giving prevailed for many years, but was not immune to influences from the surrounding environment. Although this study is unlikely to break new ground on the age-old debate of how best to model human behavior, it may help provide some evidence for the notion that a rational actor model importantly assumes away certain motivations that are important to the sustenance of a cultural commons. Chief among those, the recently negotiated GISN framework suggests, is a norm of reciprocity, where the contributions of those who give into the commons are recognized and rewarded with some of its benefits.

The breakdown of the GISN precipitated by Indonesia's withdrawal provides us with a rich entry point into the question of how the GISN managed, and was affected by, the interaction between commons-based and property-based norms. (I'm also quite interested in what other changes in IP norms, from the introduction of patents on genetic material to the TRIPS Agreement did to the GISN, but the existing literature sheds no light on the subject.) The rhetoric invoked by the Indonesians, and repeated references to themes developed in the access to medicines movements and campaigns around "biopiracy" suggest that current conflicts over intellectual property had a deep influence on the schism.

Indeed, the metaphor of "contagion" (made irresistible by the new blockbuster movie of that same name) may be an appropriate way to describe what

happened when intellectual property norms came into close contact with the collaborative norms of the GISN. Statements made by Indonesia's health minister,¹⁹ and the general approach adopted by the country, signaled that they were departing from the "ethos and practice of ... sharing" that characterized the GISN, and replacing it with an ethos of "sovereign property."²⁰ Perhaps most indicative, Indonesia's first move, after withdrawing from the GISN in 2007, was to sign an MOU with a US pharmaceutical company, Baxter International, providing the company with access to the relevant flu samples, in exchange for provision of vaccine and expertise.²¹ This is the substitution of commons-based norms for property-based norms, and it threw the GISN into grave crisis. Though this bears further investigation, it does seem to suggest that the encroachment of strong IP norms (including patents in genetic material, but also the upward harmonization of patent law imposed in treaties like TRIPS), triggered an eventual breakdown of the communal norms of the GISN.

¹⁹ See, e.g. Interview with Supari in *NATURE*, Vol 450 No. 20, December 27, 2007 (calling the GISN "obviously unfair and opaque. Samples shared become the property of the WHO collaborating centres in rich countries, where they are used to generate research papers, patents and to commercialize vaccines. But the developing countries that supply the samples do not share in these benefits. In the event of a pandemic, we also risk having no access to vaccines, or having to buy them at prices we cannot afford, despite the fact that the vaccines were developed using our samples."); see id. (also noting that Indonesia must be "free to assert its rights over samples" and that material transfer agreements protecting these rights must be required).

²⁰ David P. Fidler, *Influenza Virus Samples*, *International Law and Global Health Diplomacy*, CDC, *Emerging Infectious Diseases*, Vol. 14, No. 1, January 2008, p. 89.

²¹ *Intellasia News Service*, *Indonesia demands new vaccine rules before resuming bird flu sample sharing*, Feb 19, 2007. Perhaps more telling still, the assistant director general for communicable diseases at WHO, David Heymann, told a journalist that "I believe the minister has done the right thing to discuss with Baxter making the vaccines available in Indonesia. That's what every country will do when they need vaccines. They make deals with companies." *RI Will Not Share Flu Samples*, *Jakarta Post*, Feb. 17, 2007.

While some might be inclined to look at the resolution of the crisis as a sign that property norms can both disrupt, and provide the basis for a sound reconstruction, of the commons, I suspect the story is rather more complicated. Something like property norms were surely invoked by the Indonesians, although one can also characterize the relevant norms as those of sovereignty (insofar as its is norms of sovereign borders and control that prevented scientists or businessmen from elsewhere from simply collecting samples in Indonesia themselves). But the norms generated by the settlement were not property norms in the conventional sense, but rather bore marks of the more fluid forms of reciprocity and collectivity that we should perhaps come to associate with the commons. For example, under the new Framework, there is no guarantee that the country that gives the critical samples to the GISN will receive any of the vaccine supply awarded to the WHO, nor is there any direct form of compensation required from companies to countries. Rather, companies must fund the GISN as a whole, and contribute to a pool that will benefit developing countries as a whole, with the decision of how to distribute those benefits left to the WHO.

This brings us to the final question that I posed, about whether our analysis of the cultural commons should proceed solely under the idiom of welfarism and efficiency, or must also reckon with values like equity and participation. At one level, the answer is very clear: when considering what seems to make the GISN work, and especially what allowed the collaboration to resume after the Indonesian crisis, practices of reciprocity and equity, and perhaps even procedural fairness (e.g.

voice and transparency) clearly have had an important role to play. This itself doesn't answer the normative question of how we should evaluate a commons – whether we should bring only values of efficiency into view, or other values too – but it may provide a productive place in which to begin to puzzle about this question.