



## The art of medicine Going viral through music

For more on **Song of Contagion** see <http://songofcontagion.com>

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When I was 7 years old, the fierce French woman tasked with teaching me to play the piano stomped off in search of my mother and refunded the first term's fees. I was unteachable, she declared. My musical ignorance remains such that I recently asked a composer to write a tune expressing the mismatch between need and resources in global health.

The reasoning behind that improbable suggestion? For decades, the global health community has been lamenting the fact that the diseases that get most attention and money are seldom those that cause most misery to patients, families, and communities across the world. We write books and papers about it, we give turgid PowerPoint presentations at conferences. We assign acronyms such as NTDs (neglected tropical diseases), in which centuries of unfair decision making by individuals, governments, and corporations are boiled down to three anodyne letters. And then we try to unpick our acronyms, using concepts that begin to encompass the social, economic, political, and environmental reasons for that neglect; syndemics is the latest hot example.

And still, few people outside the world of public health give much thought to why they've all heard of Zika but know next to nothing about dengue. Zika has affected a few thousand families and generated reams of press coverage. Meanwhile dengue, which hospitalises hundreds of thousands every year, gets barely a mention. The Zika coverage was largely driven by two things. The first was the geographical coincidence between the disease outbreak and the 2016 Olympics in Brazil, which, with athletes from almost every nation at the games, brought it close to "us", wherever we are. The second was the emotionally striking consequences of infection in

pregnant women, which made Zika front-page news. The macabre truth is that photos of infants with small heads sell newspapers and research proposals in a way that pictures of patients with dengue haemorrhagic fever never will.

It's unlikely that another presentation will lead people who don't already reflect on such things to give them any thought. But what if those of us who do reflect on such things changed our tune? What if we tried to write a song that mapped things like disease burden, press coverage, geographical proximity, and funding onto musical parameters, so that you could "hear" the difference between diseases? Might that get people thinking about global health in the way that the musical *Hamilton* has engaged Americans with their political roots?

It's a very long shot. But let's just imagine varying a piece of music by the things we put on graphs. Let the burden of disease be tempo: the more people affected, the faster the beat. The funding is volume: the more cash thrown at a disease, the louder the music. In between come the other, distorting factors. You could map media onto pitch: the more coverage a condition gets, the screechier the music. Geographical proximity might be represented by rhythm: a Brazilian samba for Zika perhaps sounding more familiar than the gamelan tunes representing lesser-known dengue's impact in southeast Asia.

I took the idea to Tony Haynes, a composer who also conducts the Grand Union Orchestra, a fabulous ensemble of artists from most of the world's great musical traditions who have melted together in east London, UK. Although I later learned that he knew from the outset that the idea wouldn't make good listening in its original, musically illiterate form, he was game enough to embrace the general idea. With support from the ever-adventurous Wellcome Trust, we embarked on a series of public discussions that put us on the road towards *Song of Contagion*.

At the first open meeting, I explained the idea to a delightfully mixed group of people with a shared curiosity about turning disease into music. The eclectic audience pulled the comforting rug of jargon from under my feet. I could not use catch-all epi-mafia phrases such as "socio-cultural determinants of disease" or "structural drivers of inequality", much less words like "syndemic". We had to use plain English to parse complex ideas into simple parameters that would map on to the building blocks of music—melody, harmony, rhythm. In the course of our discussions, the factors that influence the importance assigned to a disease resolved themselves into four categories that interact in complex but often predictable ways.

First, characteristics of the disease itself; they fell largely along spectra. Is it rare or common? Is it non-communicable, infectious, or contagious? Is it chronic, recurring, or acute?

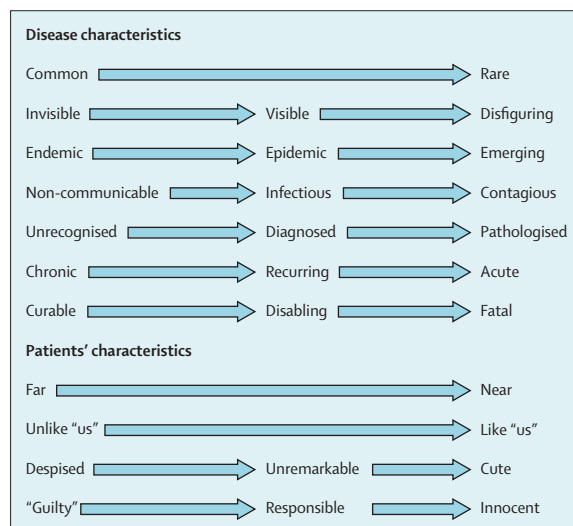


Figure: Factors that influence the importance accorded to different diseases

It is invisible, visible, or visually shocking? Is it preventable, curable, treatable, disabling, or fatal?

Second, the real or subjectively perceived characteristics of the people most likely to contract the disease or condition. These also fall along spectra. Are they geographically far from the decision makers, or in their back yard? And culturally: are they unlike “us” or like “us”? Are they people that “we” don’t even think about, or people who tug at our heartstrings? Are they infected because they did something deemed wicked by some people, like inject drugs, or are they “innocent victims”? In general, the closer a disease is to the left of the spectra shown in the figure, the less importance it is accorded in public discourse and funding. Invisible will get less attention than shocking, although that will be trumped by cuddly and near.

The relationships are further altered by the third category of influencing factors, in which sit groups of people, the various “us” whose judgement falls on the affected. These include politicians and the groups that influence them directly (voters and technocrats) and less directly (patients and patient advocates, pharmaceutical companies, and other corporate interests), together with the media. These groups can distort the predictable relationship between disease and patient characteristics and the perceived importance of a disease. For example, the media are easily excited by diseases that are rare, infectious, acute, disfiguring, and affect the cuddly, whereas pharmaceutical companies, with an eye to long-term sales, will throw their weight behind diseases that are common, chronic, and perhaps also invisible (thus easy to overdiagnose), and that affect the solvent or the insured.

In the final category are the physical and environmental structures that affect disease—things like sanitation, housing, pollution, medicines, and functional health systems. These operate on the spectra in the first category. Good sanitation, for example, can turn cholera from high to zero prevalence overnight, as London learned when Joseph Bazalgette’s pumping stations were switched on in the 1860s.

One composition in *Song of Contagion* takes on London’s drains, contrasting the path of cholera in the UK with that in India. The slum communities ravaged by cholera had little influence on 19th-century British politicians, just as they have little influence on Indian politicians today. On the “unlike us” to “like us” spectrum, people who live in slums are just too unlike politicians. Parliamentarians in London invested in Bazalgette’s work largely out of self-interest, after the “Big Stink” of 1858 chased them out of their Thames-side offices. But invest they did, with the unintended benefit that cholera was also chased from the land. Politicians in India never made the same investment so cholera continues to kill (and in our song, the Indian ragas continue after the Victorian pomp has faded).

The interactions in the composition that trace the story of HIV/AIDS from its appearance in media-smart gay men in the USA are more complex. As mortality rose, activists shut down



The Grand Union Orchestra sounding out disease

Wall Street and pulled other stunts that hit the headlines. That forced more research spending, and with it drug discovery. HIV/AIDS shifted from “fatal” to “treatable”, and from 1997 deaths began to fall. In Africa, however, treatment had less immediate effect, because adequately funded, functional health systems were largely absent. Again patient activists led the way, and again they focused on drugs, this time pushing for price reductions. They succeeded because technocrats and others enlisted public support by drawing attention to who was affected in Africa. The narrative changed from a disease affecting “despised” and “guilty” groups (gay men, people who inject drugs) to one affecting the “innocent” and “cute” (loyal wives and their babies).

*Song of Contagion* remains a work in progress. It will be less mechanical than I had first imagined, and more visceral. Rather than the same tune being played repeatedly with different data-driven combinations of the musical parameters representing burden of disease, media attention, “proximity”, and funding, each pairing of disease and major influencer will have its own, original composition. As well as pairings of cholera and infrastructure, AIDS and activism, and medication and health systems, we’ll have dengue and Zika paired with media attention; coronary heart disease with corporate lobbying; and post-traumatic stress disorder with invisibility and the us/them spectrum.

Some researchers dismiss public engagement as a waste of time. But for me it’s been enriching. Although I remain as tuneless as ever, *Song of Contagion*—which will be performed at Wilton’s Music Hall, London, UK, on June 13–17, 2017—has forced me to think more systematically about the factors that drive decision making in global health, and to begin to construct a framework through which their interaction can be made explicit, predictable, and perhaps more susceptible to planned interference.

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**Further reading**

- Mendenhall E. Syndemics: a new path for global health research. *Lancet* 2017; **389**: 889–91
- Haynes T. Composition and arranging techniques from Grand Union Orchestra composer/director Tony Haynes. *An Alliance of Music and Science*. 2017. <https://tonyhaynesmusic.wordpress.com/2017/03/30/57-an-alliance-of-music-and-science/> (accessed May 18, 2017)
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