A Tireless Virus That Knows No Borders

By Matthew O. Jackson

A virus that spreads as easily as the coronavirus will continue to be a problem until a vaccine is developed, or until most of the world’s population has been infected. In fact, even with a vaccine it is almost impossible to eradicate a disease that reproduces exponentially: the only such human disease that has been completely eliminated is smallpox. Understanding and managing our contagion is therefore vital to our long-term health. Drastically lowering our contact with other people and our travel offers us a crude and costly, but effective, way to slow the progression of the virus. However, this puts our economies in danger, and so managing our health necessarily involves managing our economies.

This co-management involves understanding three types of networks: contact networks that spread the disease, the economic networks that support us, and the communication networks that shape our beliefs and behaviors. Coordination is needed across all three of these interacting networks. The global nature of these networks also requires coordination between countries.

The importance of international coordination is obvious when looking at the virus itself. So far, it has largely been handled by each country acting on its own. While one area was slowing the virus down and getting it under control, it was growing somewhere else. Some countries are opening up, while it is just beginning to hit its peak growth in others. An analogy is trying to get rid of termites in a house. Fumigating on a room-by-room basis is much less effective than fumigating the whole house. In the case of a pandemic, optimizing globally does not necessarily involve shutting down in unison, but it does involve taking neighbors into account. It is impossible to completely seal international borders – both physically and economically, and even tiny amounts of contact can re-infect an area. Without coordination within and across countries we will be endlessly reacting to resurgences of the virus.

Beyond human contact, this crisis also involves dense economic networks in which, for instance, thousands of parts are shipped back and forth between countries before finally becoming a product such as a phone. The software which most of our devices require just to function is developed and constantly updated by teams across the globe. The economy is like a symphony that operates wonderfully when everything is in time, but quickly becomes a disaster when that timing is off. Opening and closing economies solely in response to local conditions, not only sustains and re-invites the disease, but also leads to production nightmares. A proper plan for minimizing economic damage involves international coordination to keep whole supply networks in sync, as a single link failure can cascade through a whole chain.

As we are starting to see the enormous economic costs associated with lost production and unemployed workers, we also face a potential financial crisis. Some defaults by individuals, businesses, and even countries are already becoming unavoidable. By chance, the memories of
the last financial crisis are fresh enough so that central banks and other arms of governments have been more proactive than they otherwise might have been. But the dangers of financial contagion as well as a credit freeze are looming. The policies needed to avoid such a meltdown will require acting on several levels. There are vulnerable unemployed workers and families who need direct help and whose reduced demand will be pronounced and will drag economies down. There are businesses that have debts but no revenue -- including whole industries of travel, food, tourism, and retail -- as well as the extensive supply chains mentioned above that are at risk. There are associated financial networks that extend well across international borders, and which means that one country’s financial crisis becomes everyone’s. Governments have been helping the unemployed and the idled businesses, but the economic slow-down will be prolonged and has its own potential for contagion. Identifying central business failures and defaults and avoiding them before they cascade to other businesses and throughout the financial network is essential.

The third set of networks in which there is contagion are the ones that shape people’s attitudes and beliefs. When people are stressed they crave information and, when accurate information is not broadly available, falsehoods easily spread and can be divisive. The effects of the virus are spread unevenly both within and across countries. Fighting this virus requires extreme care by everyone: not just to protect themselves, but to avoid putting others at risk. That requires people to have a strong sense of urgency and common purpose, and also to know exactly what to do. Governments need to provide very explicit, repeated, and consistent information, combined with transparency – to help counter the inevitable rumors and divisions that will otherwise spread widely. People also need to appreciate that other continents’ surging infections and sagging economies are everyone’s problem.

We can hope that a vaccine is developed and widely distributed faster than ever before, and that in the meanwhile more proactive testing and drugs will prove effective in slowing the spread lowering hospitalization rates. Even in a hopeful scenario, however, we will be living with this virus for a while. Full international coordination is needed to contain the virus, to manage our production and financial networks, and to properly inform people and maintain their good will. Without global cooperation we will have unnecessary and repeated spikes in the disease and economic crises. This virus is tireless and it knows no borders.

For more reading on the fundamentals of networks:

https://web.stanford.edu/~jacksonm/books.html

https://web.stanford.edu/~jacksonm/HumanNetworkJackson_Chapter3_Co contagion.pdf