

COVID-19: A Reflection and Propagation Model for Latin America (INCAE Business School, 3/19)

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Abstract

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What is the message? COVID-19 is beginning to affect countries in Latin America, which are drawing on global experience to date to determine how to respond. A propagation model of the virus demonstrates that proactive societies will suffer far less than passive, closed, or even prepared societies.

What is the evidence? Healthcare and research experience in multiple Latin American countries, together with propagation model simulation.

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COVID-19 in Latin America

With the World Health Organization's pandemic declaration due to the impressive rise in the number of infections, deaths, and affected countries, as well as with the manifestations of the economic effects in the stock markets, many people around the world are beginning to

rationalize what is going on and to decode the numerous impacts of the coronavirus propagation. During the last few days, we have all been experiencing such abrupt and impetuous changes at a global level.

Our role as academic members must focus on trying to shed some light on the current situation and make our efforts to help people understand the implications of the coronavirus outbreak, contributing to prevent them to fall into the two dangerous extremes of either intemperate panic or superficial minimization – especially in the face of the apparent disbelief about the seriousness of the situation in many Latin American societies, including some decision-makers and even some governments.

This role is especially important in the Latin American context as most of countries in the region are experiencing the first phases of the outbreak. Moreover, Latin America is a particularly complex and vulnerable region, characterized by different levels of maturity in terms of economic diversification and dependence, political legitimacy, as well as readiness and effectiveness of the healthcare systems. There are currently several countries in the world at the apex of their fight against the coronavirus spread that are adopting different strategies and obtaining differing results.

The ultimate question is *what to do as a society and as individuals in this convoluted conjuncture?* We can learn crucial lessons from the experiences of countries at different stages of the crisis and identify best practices in order to minimize the risk of reaching an unbearable point of collapse of already fragile systems.

Learning from Global Experience

Some countries have been quite successful in confronting this crisis. Consider for instance the contrast between Coronavirus in Hubei province — where the disease originated, and the government equivocated before finding a workable strategy — and the rest of China. In Hubei province, 1,190 people per million acquired the disease, there are still 22,000 active cases, and 6.5% of closed cases ended up in death; the equivalent numbers in the rest of China are 10 per million, 1,100 active cases, and 0.9% deceased. In China, what worked was quarantine and geographical isolation.

The first and most prominent lesson we can learn from China is that, with the adequate measures, the virus is curable, and the spread is manageable. However, this result requires substantial decisions with harsh implications for social interactions, common daily life, and economic activities. The execution of proper measures needs strong political legitimacy and commitment.

Approaches in other countries differ. The experience of several European countries, especially Italy, Spain, France and the UK, seems to suggest that these results could be hard to achieve in more secularized and manifold Western democratic systems. The adoption and enforcement of this kind of measures in most Latin American countries remains an open question, given the risk for governments to lose trust and credibility if—for any reason—the decisions do not prove effective enough to limit the spread of the virus and the consequences on the socio-economic system.

Affected Asian countries are also showing to the world the crucial importance of transparency and data accuracy for the management of the coronavirus crisis. People need understand what is happening, understand the need of drastic measures of contention, and rapidly change their behavior and habits. It seems to be clear at this point that postponing the reaction is the worse option and it is necessary to actively involve the society to reach effective results. Unfortunately, the decisions taken in some European countries during the last weeks are a dramatic example of how fast things can degenerate once the virus begins to spread exponentially.

Another important aspect of the pandemic crisis is the evidence of which types of measures seem to be more effective in controlling the spread. Here some emblematic examples are Singapore and Hong Kong that, regardless their strong links with China, have been able to properly deal with it thanks to a “from micro to macro” approach based on extensive controls (to both symptomatic and asymptomatic people), the identification and isolation of active cases, and the thorough reconstruction of the network of contacts of infected people. South Korea achieved similar success –after an initial explosive contagion—largely through massive, well-targeted testing. Other countries in Northern Europe have suffered large numbers of cases but have concentrated on effectiveness of treatment and kept mortality at bay. For instance, at the time of this writing, Italy has 3.5 times as many cases as Germany, but 97 times as many deaths.

Models of Propagation: Benefits of Proactive Preparation

We created a basic attempt to simulate a virus propagation model. The model is neither sophisticated nor excessively precise, but we think it is useful as an early attempt to understand the effects of some popular measures discussed during these days. In doing so, we reproduce the impacts of different measures that governments around the world are adopting to try to diminish the incidence of the transmission.

Consider the following simulated propagation model. We define five open societies of 100,000 individuals each and we define six possible status for individuals. Each individual is exposed to someone else one per period, with 95% of those exposure happening with a compatriot.

- Healthy
- Latent (or asymptomatic)
- Minor infection
- Serious infection
- Immune (or recovered)

Based on current data, we set the following transitions, assuming that the duration of each period is one day.

- Probability of contagion (change status from healthy to latent after meeting with an infected individual): $1/6$
- Probability of changing status from latent to infected: $1/5.1$
- Probability of changing status from minor infection to immune: $1/14$
- Probability of changing status from serious infection to immune: $1/30$
- Fatality rate: 0.14

We assign a type to each society, with five types.

- Origin society: The one with “patient zero”.
- Passive society: Has certain contacts with other societies (and therefore a certain probability to getting in touch with somebody that carries the virus) and does not take any preventive measures.
- Closed society: Isolates from the rest and thus the probability of getting in touch with

external individuals is very low.

- Prepared society: Isolates serious cases and prevents them to get in touch with the rest of individuals.
- Proactive society: Takes timely actions to minimize the contact between infected individuals (regardless of the seriousness of the infection) and the rest of individuals, meaning that the probability of spreading the virus is lower.

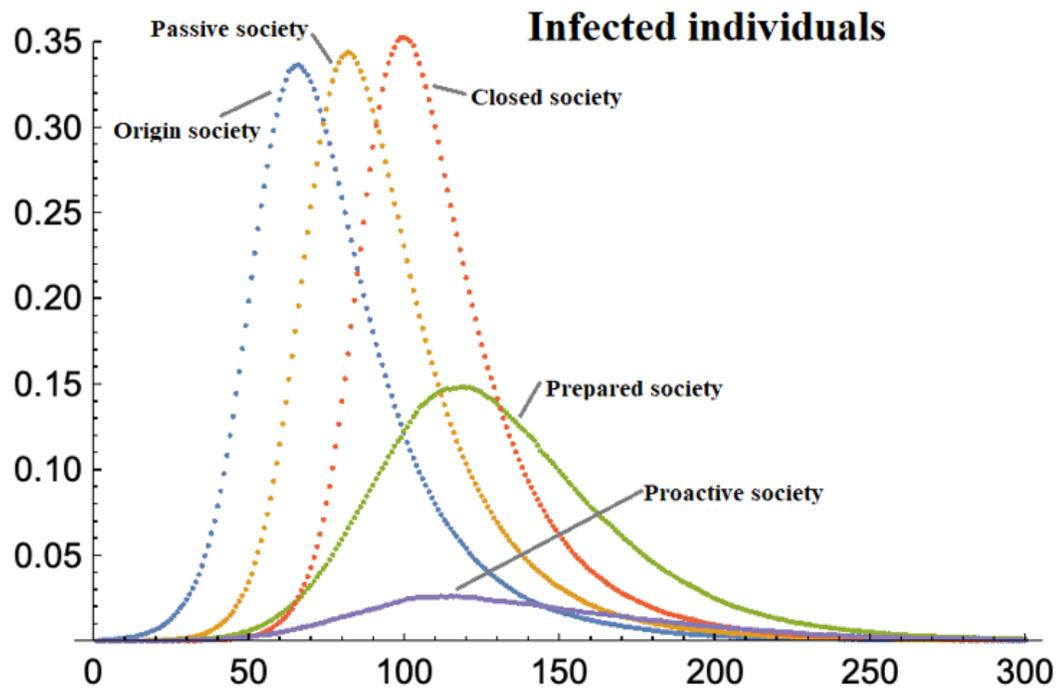


Figure 1. Results of the virus propagation model: Infected individuals

Source: Authors' calculations

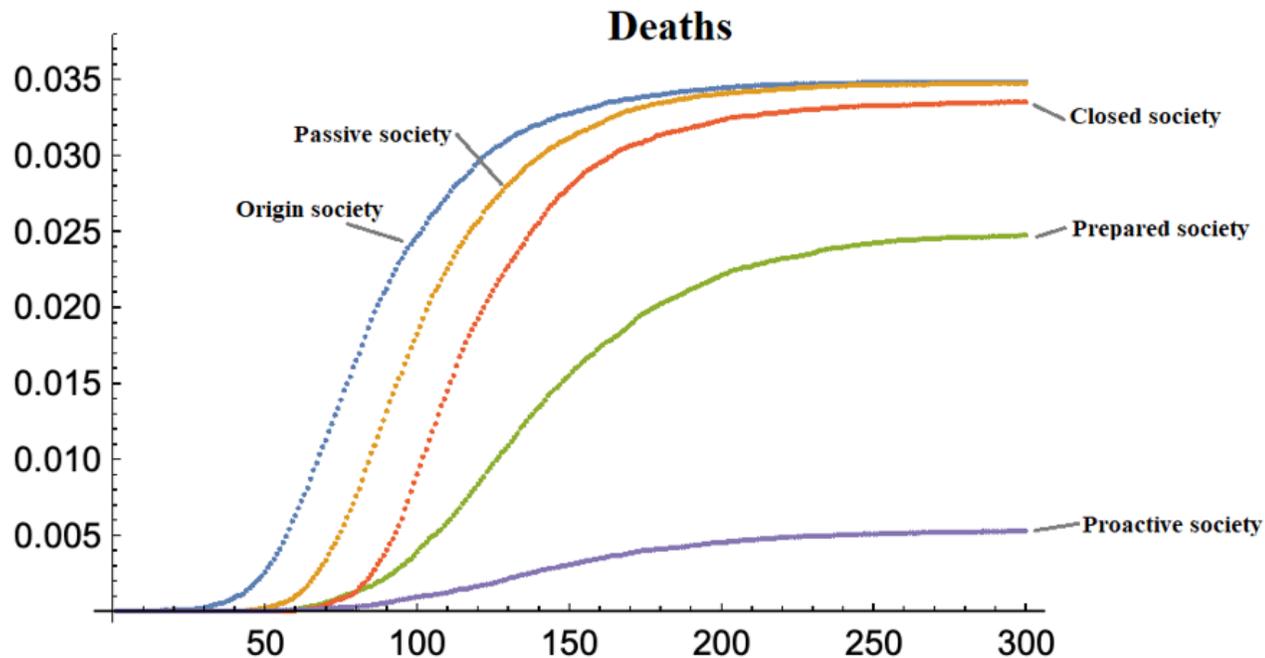


Figure 2. Results of the virus propagation model: Deaths

Source: Authors' calculations

The results of the simulation exercise highlight the pointlessness of simply limiting one's strategy to "closing the country," as the only effect is deferring the wave, with no substantial gains in terms of infected cases and deaths. Adopting preventive measures, such as isolating the most serious cases, seems to give some better results, but the most effective option appears to be the strict proactive approach that implies timely actions even before the number of cases begins to increase. At least some Latin American countries seem to be on the right track on this aspect, adopting early preventive measures to flatten the transmission curve and keep the number of cases that require medical attention under control and in line with the current possibilities of the healthcare systems.

These exercises also remind us of some hard facts. The more successful case (the "proactive"), precisely because it manages to contain the speed of the problem, also takes longer before it

fades away. And while yes, successful countries have managed to limit the “exponential growth” phase of the contagion to only three weeks and see a fall in active cases (more people getting cured than getting sick) shortly after. But that does not change the fact that, past those stages, harsh measures will have to remain in place for a long period. Those measures carry a heavy logistical cost and will make economic performance quite poor for months, perhaps years, until a vaccine or a cure have been developed, or until enough immunity exists in the population. Preventive measures will still be needed because different countries will enter quick contagion at different points in time, and because some of those countries will not be able to control the problem before it saturates.

Variation Throughout Latin America

Latin American countries will progressively be affected by coronavirus and in the next weeks we will see an increase in its incidence. Nevertheless, the real impacts will be varied and will prevalently depend on the measures adopted during these days by public authorities and individuals’ reactions. The exposure to risk is not the same for the whole region and the strongest effects will come from different sources, such as the decrease of commodity prices for most of countries in the Southern Cone, the proximity and trade dependence with the USA for countries in the Northern hemisphere, the repercussion of the sudden inhibition of the tourism industry, just to mention a few.

We will all have to make decisions in a more volatile economic environment, characterized by negative shocks to both the demand side (contracted consumption) and the supply sides (difficult access to logistic systems, providers, workers, key resources), as well as troubled financial markets that imply huge losses for both firms and individuals. Some sectors will be more affected than others and, so far, it seems that the new, service-based, high-tech economy is more resilient and adaptable to this type of changes. It also seems that there will be a need for a deep redefinition of international cooperation and intergovernmental organizations, whose roles have been weakened during the last years.

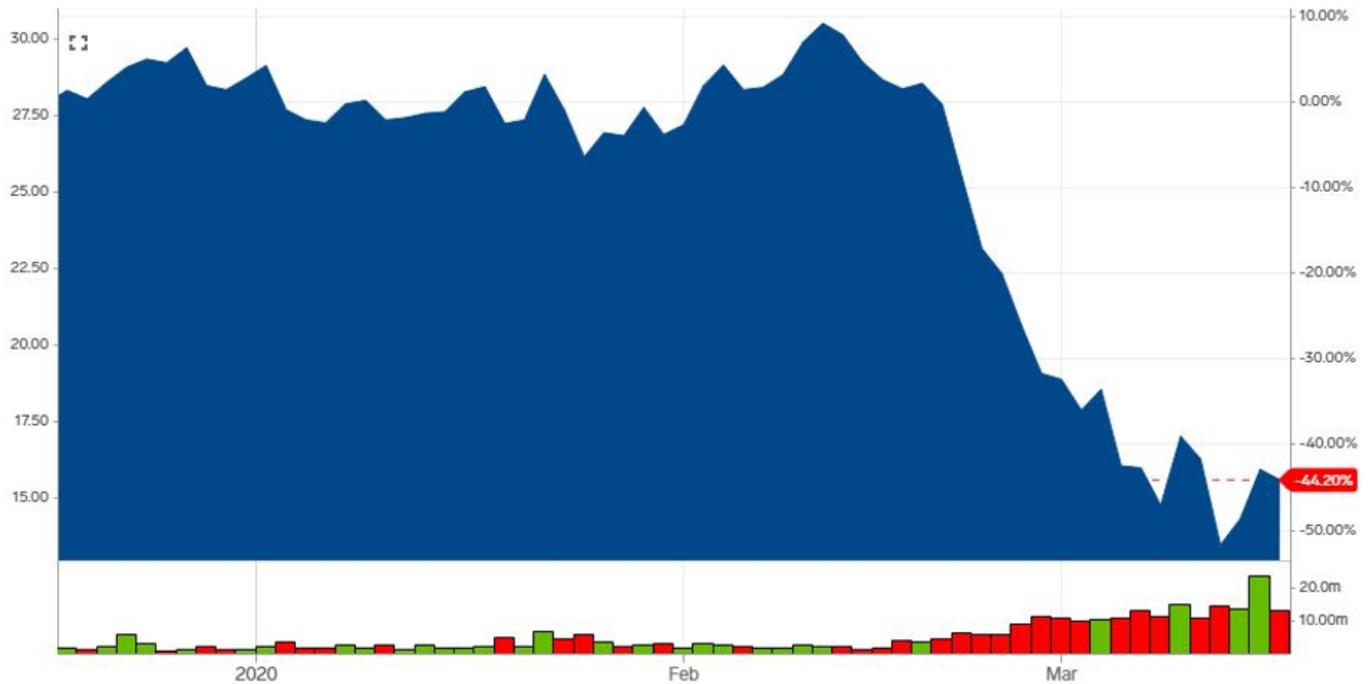


Figure 3. Example of stock price movement during the last 3 months: American Airlines

Source: Markets Insider, retrieved on March 17, 2020
<https://markets.businessinsider.com/stocks/aal-stock>



Figure 4. Example of stock price movement during the last 3 months: Zoom Technologies

Source: Markets Insider, retrieved on March 17, 2020
(<https://markets.businessinsider.com/stocks/zoom-stock>)

Looking Forward

In this troublesome context, many questions remain open for Latin America. Will the political response reinforce the populist tendency, or will we see a return to more open and moderate dialectics? Will countries be able to implement and support the necessary fiscal efforts to counterbalance the complex economic conjecture? Will organizations be able to think and make decisions for the long-term, even when this implies a sacrifice of immediate profitability? Will we see a profound change in how global value chains are managed, with a better and wider diversification of risks across providers and regions? Will this be an occasion to finally understand the great benefits that technological change can bring to many and diverse sectors,

making people more flexible and receptive? Will individuals act as a mutually supportive community and will be able, as a society, to learn how to deal with such challenging incidents in the future?

What is for certain is that—like everything in life—this emergency will come to an end. It is also certain that the “post-coronavirus” world (and Latin America) will look rather different. Hopefully, after the pain and the sorrow, we would have learned valuable lessons for the future, saw better global relations and coordination, understood the importance of preparing in advance for such extreme events, and be ready to go on stronger than ever.