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Some micro/macro insights on the economics of coronavirus. Part 2: Health policy

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During the lockdowns in place in many countries, certain essential activities must be maintained. This column, the second in a three-part series, asks how we can determine a policy of exemptions to containment beyond these obvious activities, as well as how we might eventually exit containment. It argues that the cost of going to work – i.e. the risk of contracting the disease and becoming a vector of transmission – has to be compared to the societal benefit of the activity generated, and that the calculation often differs depending on whether one adopts an individual or a collective point of view.

There is much to be said about the management of the health crisis. Let's start with the call for good citizenship. At the beginning of March, the French government counted on the civic-mindedness of its citizens to encourage them to behave responsibly. The failure of this policy was widely reported in the media. Why wasn't education and information enough? Many citizens expressed their rejection of basic preventive measures by explaining that they were prepared to take the risk for themselves. Do they understand that their behaviour affects not only their own survival, but also that of others?

There are two possible explanations for this lack of civic-mindedness. The first is that these people have not really understood this negative externality, similar to those who refuse vaccination for other diseases. The second explanation is that this externality is understood but is simply not taken into account by individuals who are more concerned with their own wellbeing than with the risk that their behaviour poses to others. This is a bit like climate change. In both cases, your efforts protect me and my efforts protect you. Perhaps I could just rely on your efforts while abstracting from my own, in a free-rider behaviour that has been well studied by economists. The lightness of many of our fellow citizens in applying the most basic rules of social distancing is a perfect illustration of this problem.

There are three solutions to this stowaway behaviour inherent in any problem of externality, in a pandemic as in climate change. Plan A applies the principle of responsibility. It is about making individuals pay for the value of human lives lost through their behaviour. In the case of COVID-19, this plan is, of course, impossible to implement since the cause-and-effect relationship cannot be established. Plan B imposes a ‘price signal’ on anyone wishing to escape from its confinement. It consists of charging each person who moves a price equal to the expected value of the health damage caused by the move. For example, a ‘corona tax’ could be put in place in proportion to the length of time each citizen has been out of confinement. Nevertheless, despite recent technological developments, the implementation of such a solution remains complex and raises serious ethical questions. All that remains is Plan C, that of a blind policy of confinement of the entire population tempered by a few exemptions. This is the health approach currently followed by more and more countries.

Let's continue with the controversy over the usefulness of containment. As we have seen, the economic and social cost is going to be severe, with a loss of wealth that could exceed 10% of annual GDP (i.e. around €250 billion in the case of France). In order to assess the value of this policy, we must compare the loss it entails with that of non-confinement, which, as we have seen, could lead to an excess mortality of one million people. How can we compare €250 billion to a million deaths? To make these things comparable, we must somehow put a value on human life. There are many ways of answering this question at the intersection of multiple social sciences. Economists have their methods, studying how people themselves value their lives. Everyone can take action to increase their life expectancy, through simple preventive gestures (crossing the street at pedestrian crossings, brushing their teeth, maintaining physical activity, etc.) or through safety investments (changing tyres, moving to a less polluted area, etc.). These actions are often costly, and the study of behaviour and market prices makes it possible to estimate a 'value of statistical life'. In France, this value is set at €3 million, using this type of method. In other words, the state is prepared to spend up to €3 million to save a whole life in expectancy (Commissariat général à la stratégie et à la prospective 2013). In this way, the benefit of reducing the speed on our roads to 80 km/h, the usefulness of a new motorway, a maternity hospital in a rural area, or a new MRI at the hospital in Toulouse, for example, is estimated.

Let us now estimate the value of one million deaths from COVID-19. It is probably equivalent to the loss of 300,000 whole lives given the age distribution of the victims of this virus. At €3 million a lifetime, this gives us a value of this excess mortality equal to €900 billion. It is much higher than the estimated cost of €250 billion in economic loss due to two months' containment. Of course, we should always keep in mind the assumptions that lie behind this estimation.[1] For example, several sources suggest that the death rate might be lower than considered here. In addition, the confinement strategy will obviously not reduce mortality to zero. Both of these points would reduce the cost of excess mortality. On the other hand, it is questionable whether one should use age-adjusted values to compute this cost, and not doing so would actually result in a sizable increase. Finally, there is an added benefit of confinement related to the reduction in the burden on the health system, which is likely to reduce mortality from other sources. As new information arrives, it should be possible to refine these estimates, but under reasonable health and economic assumptions, the refinements might end up compensating each other, and the message therefore seems clear. Between the options of laissez-faire and containment, and even disregarding the obvious ethical issues in this case, the latter far outweighs the former. Perhaps we should translate this text into Dutch for Mark Rutte's government?

Total containment is obviously impossible. It is crucial that certain essential activities be maintained in the agri-food, energy, waste and safety sectors, not to mention, of course, health. How do we determine the policy of exemptions to containment beyond these obvious cases? As with any individual or collective decision, wisdom dictates that we compare the costs and benefits of each possible action. The cost of going to work corresponds to the risk of contracting the disease and becoming a vector of

transmission. Depending on the type of work and the state of the health system, the transmission models used by epidemiologists must make it possible to estimate the impact of this action on overall excess mortality. This information can be transformed into an economic value by using the value of human life mentioned above. This cost must be compared to the societal benefit of the activity generated. For a nurse, a baker, a scientist in search of a vaccine, there is certainly no debate. For a teacher or a bank clerk, the calculation is probably more complicated, all the more so as relatively efficient teleworking solutions exist today for these professions. Once the accompanying health measures have been defined, it will therefore be necessary to provide for a gradual policy of exit from confinement targeted at various professions, using this cost-benefit method.

These calculations often differ depending on whether one adopts the individual or the collective point of view. In normal times and with a frictionless labour market, the equilibrium wage of a job is equal to the social value of its marginal production. In this case, there is no difference between the two points of view. But in times of crisis, it is likely that the social value of some jobs is much higher than the wage received by these employees. We are obviously thinking of all hospital staff, saleswomen in food stores and postal workers, for example. In this case, these categories of employees may find themselves in a situation where they consider their health risk to be excessive in relation to their remuneration, even though from the point of view of society, their work is socially desirable. The exercise of their right of withdrawal would then lead to a failure of the system. Should the right of withdrawal be restricted accordingly? Personally, we are more in favour of paying exceptional bonuses to reduce the gap between pay and the social value creation of the corresponding work. Beyond the objective of demonstrating our collective gratitude to those who take risks to rescue us, this policy makes it possible to align private interests with the common good, and to federate energies on the most essential activities in this period of crisis.

Here again, once the crisis is over, we will have to reflect on the social value of these activities in the long term and on the possible permanent realignment of the remuneration of some of these professions, which are on the front line in times of crisis. Finally, let us not ignore the importance of the intrinsic motivations (self-sacrifice, willingness to help, pleasure taken in accomplishing a social or humanitarian task) of our care staff to carry out their missions. The expressions of gratitude of the population towards them, such as the spontaneous applause that takes place every evening at 8 pm, take on their full importance here.

Finally, there is the question of how to exit the containment. A recent report published under the direction of Professor Neil Ferguson of Imperial College in the UK indicates that a radical strategy for the removal of COVID-19 of the type currently applied in our country appears to be the only one likely to avoid the total submersion of the health system in the short or medium term, but would, according to the authors, expose us to the risk of a significant rebound in contamination as soon as the radical social distancing measures are lifted (Ferguson et al. 2020).

This problem is closely linked to that of the economic consequences of the epidemic and the measures taken to curb it (Baldwin and Weder di Mauro 2020). It is difficult to envisage extending systematic containment beyond the four to eight weeks that the current measures should last without incurring disproportionate economic and human costs. The production and deployment time for an effective coronavirus vaccine is estimated to be around 18 months, so it is imperative that our collective intelligence first put in place a means of exiting containment that will gradually allow economic activity to resume. We believe that such a strategy is possible and can be defined by taking maximum advantage of the multiple skills present in our society, and in particular by combining the expertise of epidemiologists and social science researchers. It should combine two main components.

The first is based on the deployment of large-scale tests. A rough estimate shows that, starting on the basis of a unit cost of 100 euros, including implementation methods, the entire French population could be tested at an overall cost of 7 billion euros, i.e. less than 0.3% of GDP. Clearly, this is an absolute priority in the current situation, and it is a very small sum compared, for example, with the estimated cost of €250 billion. If this would put more than 90% of the population back to work, the reduction in economic loss according to our initial calculations would be €225 billion. The cost-benefit analysis is therefore quickly done in favour of this strategy. Specifically, we might need a combination of two types of tests: RT-PCR-type tests to identify individuals carrying the virus, and serological tests targeting those that have been infected in the past and are now immune, as described in Dewatripont et al. (2020). Of course, in the very short term there are many obstacles, such as the lack of reagents or other inputs, or the absence of dedicated production lines. But the potential benefits justify a total mobilisation on this objective, of the type imposed on the productive apparatus in the past in times of war. In addition, the possibility exists to loosen the material constraints on the number of tests, by implementing successive clever group-level testing strategies. Under different hypothesis on within-cluster and within-group correlations, this could reduce the number of tests.

The second element that must be combined with large-scale testing is tracing, so that the results of such testing can identify in real time all contacts that people carrying the virus may have had while travelling. The identification of movements and contacts through mobile phone signals makes such tracing possible and very effective. This is particularly important because it is now recognised that many contaminations occur even when the carriers are asymptomatic and therefore unaware of the risk they pose to others. The combination of these two components is what will allow individuals who are cured or uncontaminated to gradually resume their normal activities in complete safety, and at the same time allow contaminated people, whether healthy or sick carriers, to be isolated or cared for. This is the condition for a gradual recovery of the economy, and therefore an indispensable virtuous circle, within two to three months.

Numerous recent articles report the success of these strategies, carried out in similar forms, particularly in South Korea, or combined with more or less restrictive social distancing measures, in Taiwan or Singapore. The devil is in the detail, however. In particular, it is clear that the success of these measures depends to a large extent on institutional and cultural factors that are very specific to the countries that have implemented them, and that their replication in our society could prove difficult. Social scientists, and in particular economists, have significant expertise in this area. Firstly, the use of very large geo-localised databases is now well mastered. On the other hand, it has been well known for many years by economists working on public policies, for example in the context of international development, that the various public interventions are not objects that can be transposed at will without taking into account the context, and that programmes that work very well in some countries may be totally unsuitable in others.

For several decades, economic analysis has also developed the study of incentive mechanisms, which associated with public interventions make it possible to reinforce or, on the contrary, discourage certain behaviours. The implementation of a dual strategy of testing and tracing is likely to encounter significant resistance in France, for example related to concerns about privacy or the stigma that testing can generate. Similarly, the fact that part of the population, probably the most at-risk, does not have a mobile phone suitable for rigorous monitoring is another problem. These issues are critical, as it would take only a small fraction of the population to escape the system to make it ineffective. It is therefore essential to put in place the mechanisms and incentives necessary for the chosen strategy to work. Already, open-source encrypted applications, allowing tracking that would respect the anonymity of users, have been launched, for example at the MIT Media Lab (https://safepaths.mit.edu) or in Singapore (https://bluetrace.io). With a small group of researchers from different French institutions, we are currently exploring the possibility to adapt these technologies to the French context. Similarly, specific subsidies, for example through mobile subscriptions, making individual exit authorisations at the end of confinement conditional on the use of these secure technologies, can be put in place and eventually replace the paper authorizations we currently use.

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Endnotes

1 We thank Dominique Bureau for very thoughtful comments on these and other points below.