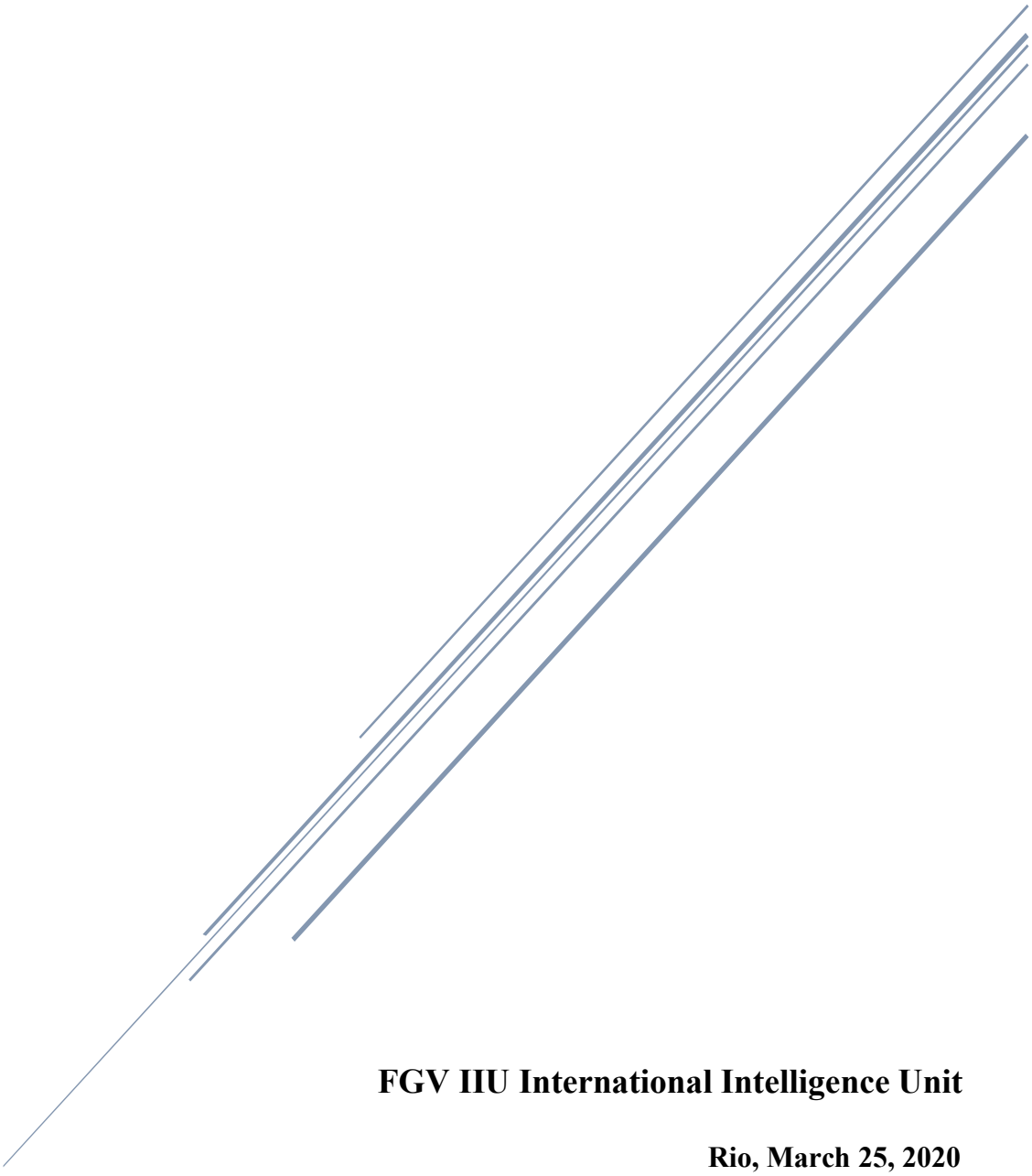
FGV IIU Flash Notes

Corona Numbers & Policies: some Reflections



FGV IIU International Intelligence Unit

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1. Introduction: beyond the virus.

The corona virus and its related disease, covid-19, have at the date of writing these lines already changed the world. About 600 thousand people are expected to have been infected by the end of this week, with a related death toll of more than 28 thousand victims. Most countries, some faster than the others, have implemented policies to deal with the epidemics and, hopefully, minimise its effects. Perhaps not surprisingly, leaving outside the preliminary and always special Chinese case, such policies are quite similar and bear a common point, they focus solely on the epidemics and, while correctly looking at the health of their citizens as a whole, they -with very few exceptions, local and restrict- disregard nearly all aspects of the socio-economic complex, putting enormous weight on controlling or rather stopping the virus.

The main purpose of this Note is neither to judge nor, even less, to criticise these options, something completely outside our competence and attributes, but to raise a warning about the consequences ensuing from what has been left out, namely, almost all the rest. Vague or general as it may be considered, it fulfils a key social task of any think tank: engage larger sectors of society in the discussion of relevant issues and choices.

Milan-based think tank ISPI (*Istituto per gli Studi di Politica Internazionale*) has been providing a fine example of such task. With a frequent newsletter addressing several aspects of the crisis (*ISPI Speciale coronavirus*), it has been supplying the public with a learned and balanced analysis of decisions, risks and perspectives, adding to social transparency on the policies at stake and raising the level of debate as a whole.

In the context of an epidemic still to a large extent unknown in terms of its realm of complex contagion mechanisms, we aim at calling for a more encompassing view, in which the individual health aspect *per se* should not end up by suppressing all other dimensions, equally or nearly equally important, of societal life.

Needless to say, this boils down to a public policy choice.

Whenever public policies are at stake, the conflict between the individual and the community viewpoints emerges conspicuously. In the case of diseases that can be lethal, it obligingly reaches dramatic aspects. The granddaughter who lives with her 90 years old beloved granddaddy will do anything to secure his survival throughout the length of the epidemic. The same, by all means, as regards anybody within a vulnerable group. The gist of the problem lies in securing in the best possible way these valid and normal personal goals without endangering the socio-economic tissue in a way that the cure eventually engenders more disgrace and damage, perhaps even in a broader scale, in a not too distant future.

It is not here that a Promethean solution to this conundrum will be found; only a serious warning and a pledge for balance, for an encompassing and innovative view that will care for a minimal functioning of the affected communities, even at times -like the present ones for some countries- when the worry with the epidemic looks overwhelming.

Two other points must be mentioned.

The first is that, in another perspective, much of what is at stake relates to social perceptions of risk, a subject well analysed by risk theoreticians and scientists. The interplay

of such perceptions with mechanisms of panic and disruptive social behaviour lies in the back of our concerns, though we shall not further elaborate on this issue here.

The second is that in every novel context, human creativity seems to become more alert. Amidst the confusing signals about the disease and its impacts, it is not unlikely that suddenly a game-changing innovation pops up; not exactly a vaccine but, for instance, a combination of drugs that may considerably reduce the mortality and ill-consequences of the virus, or of a clever preventive procedure. This will accordingly change policies and even the whole setting and nature of the problems at stake.

This Note is structured as follows. The next section makes a brief discussion of the statistics available and the state of the epidemics in select countries, without intention of a deep analysis. The purpose is to better frame the situation and raise questions still unanswered but judged important for discussing policies. These are addressed in Section 3, starting from a general framework and getting down to likely consequences of what has been implemented in major European countries and Brazil. Section 4 then tries to point out the essence of the compromise at stake, much vaster and complex than exchanging lives for economic indexes, by raising several associated questions.

The last section concludes, with some elements of an ideal design suggested.

2. The numbers.

2.1. The cross-sectional perspective.

The mathematics of epidemiological models[1] teaches us that two basic curves are those of the total number of infected cases and of total deaths. Both, if assessed on a daily basis, for instance, have two associate curves, which function like a first derivative of each: the daily number of new cases, and that of new deaths. The latter have usually an asymmetric bell-like shape and must start to consistently decrease -not necessarily at the same time- as a signal that contagion is getting under control and starting to grow slower; the same for total deaths. In a stabilised situation, both new cases will continue to decrease (towards zero), giving way to a flat plateau in the respective cumulated curves: the epidemics is then really under control.

Beyond a set of curves, a few parameters matter. The most important one, usually referred to as R_0 in the literature, refers to the *average number of persons infected by one subject carrying the virus*. The average length of the disease, once the person has been infected and falls ill, is another crucial one for planning purposes. In principle, all parameters are a function of the given (closed) social group or country, as they may be influenced by the local culture and environmental conditions.

[1] The pioneering modelling effort, the now much-cited SIR compartmental model by Kermack and McKendrick, has been long known to mathematical ecologists and medical statisticians. Both authors have written a series of papers on this theme, Kermack and McKendrick (1927) being perhaps the most famous one. For a broader, enlightened historical perspective on the subject see Bacaër (2011); see also Shen and Bar-Yam (2020).

The total number of cases and deaths for all countries are regularly posted in a few sites[1] but, unfortunately, parameters and deeper information based on further identifications of the individual cases are lacking. The most conspicuous absence is that of R_0 .

The difference between the number of infected people and deaths can be further decomposed into three categories: the cured ones and those still under treatment, who can be then divided into mild and serious cases.

Beyond usual caveats on reliability applied to any situation involving measurement of human beings, it must be noticed that *only people who have been tested can be classified as infected*. This means that a number of people may be outside those of the first cumulated curve, simply because they have not been tested. Among such non-observed subjects, the mass of infected but asymptomatic people is found, creating a serious problem for the precise measurement of the contagion dynamics (as they spread the disease).

As regards deaths, underreporting is expected to be lower.

If, from one hand, this raises doubts on the curves about total and daily infected persons, from the other it suggests that the observed fatality rates, computed as the ratio between deaths and total infected are very likely over-valued.

From the chosen website, we've made a few computations for Brazil, Germany, Italy, Portugal, Spain and the US, paying special attention to the observed fatality -previously defined- and the potential or expected fatality -number of deaths *plus* serious cases under treatment over number of infected cases.

The fatality rates, though daily oscillating, vary considerably among these countries. Notably, they are quite high in Italy -observed ratios around 10% or more- and low in Germany -observed rates around 0.5 to 1%: why? What about the Portuguese rate being higher than the Brazilian one, while the Spanish ones are becoming similar to those in Italy? Will the US rates, at present reasonable, drastically increase in the near future?

Several explanations have been provided. For instance, in Germany, besides that the proportion of people living alone is high and public health facilities are very good (in terms both of number of available beds and equipment & drugs), statistics showing the greater frequency and intensity of interactions between old people and those in the other age groups in Italy rather than in Germany have been invoked to explain the large difference in fatalities. Also, pre-emptive random screening by infection testing has been widely used there, allowing -as in South Korea- for the quick insulation and treatment of cases, notably the serious ones.

Analysing such explanations is, relevant as it may be, outside the purpose of this Note. The points to be stressed are:

i) with the exception of the two countries where the epidemic is already under control, China and South Korea, none of those previously mentioned, and actually no other shows evidence of declining "first derivatives" for the two basic total curves, telling that, in all of them, despite the inherent data problems, the process is in its first, growth stage;

[1] We've used www.worldometers.info for our evaluations.

ii) the discrepancies in fatality rates, with due regard to the many existing narratives, remain not completely explained: an implicit evidence that we do not fully know the dynamics of the epidemic in different social environments yet. The virulence and persistence of the Italian case, in particular, despite enough time of tough precautionary measures enforced, raises major doubts on our knowledge on the *hows* and *whys* needed to reduce the growth trend.

Deeper debates are starting to take place, Norman et al. (2020), Ferguson et al. (2020) and Shen et al. (2020), but no conclusive views have been reached yet.

2.2. Trends – the time dimension.

At the side of the daily situation, giving a cross-sectional view of the pandemics, the evolution of the several individual curves is telling. The trend in all countries, confirming point i) above, is an exponential one, with no turn in concavity (technically, a negative second derivative). Could we compare growth speeds, or rather, say that one country is behind the other, in terms of the contagion dynamics? Could we infer when a reversal will take place in each case?

Some, like Silvia Merler, from the Algebris Policy & Research Forum, suggest taking as reference the 'Wuhan curve' depicting the evolution of death cases per million inhabitants since the first day of the epidemics. Different variants, particularly as regards the origin for counting the days (since, for instance, the first 10 deaths, etc), exist, but the whole point is to use the Wuhan time evolution as a paradigm. Does this make sense? Aren't conditions different in Italy, or in Brazil or the US[1]?

The above questions are important because they bring forward a key element in the policy debate: the duration of the "hard times" of the epidemic and the corresponding capacity to predict -ideally in weeks- the moment in which the process could be considered under control. Unfortunately, not only reliable elements are not available for these decisions as policy makers sometimes seem to avoid this exercise, a crucial one as will be argued below.

3. The public police dilemma.

Whenever society faces a catastrophe, a public policy dilemma takes place. Broadly, it has to do with the amount of effort that will be mobilised to face, cope, reduce or minimise the catastrophe effects and the extent of the related costs -of all sorts- to achieve such positive outcome.

In the case of an epidemic, effort is translated in the global public health resources gathered, together with the precautionary measures taken, aiming at success in controlling the process, measured in terms of (hopefully few) lost souls and the duration of the hard times; an achievement to be balanced against other possible consequences.

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[1] There is already statistical evidence that the distribution of mortality rates along age groups in Italy *is different* from the one computed from Chinese data collected in Wuhan, which has been frequently and widely used.

The scope and duration of the precautionary measures are the basic adjustment variable for the unavoidable stress on the health system *and for all other costs as well*. They aim at reducing the value of R_0 for the population; without achieving a R_0 lower than 1 (one), contagion will continue to grow exponentially, and the measures will have been practically useless.

Too strict measures thus reduce the speed of contagion, the ensuing numbers of infected cases, flattening the curve of new (daily) cases and giving time to the health system to better cope with the serious cases and, eventually, a larger margin of manoeuvre in dealing, *stricto sensu*, with the epidemic. Such measures may involve the shutting down of normal business and city life activities, confining the population to a rigorous quarantine and even leading the economy to a halt.

The whole situation is actually more complex than this, as clever attempts -like previous massive testing of risk or potentially heavily-exposed groups, or the substitution of targeted vertical measures for bluntly horizontal ones- may add efficiency to the fight of the epidemics; indeed, a broad portfolio of precautionary schemes, involving passive and pro-active measures, and activity-reducing regulations can ideally be devised, each giving way to its own cost-benefit compromise[1].

Notwithstanding, the present reality in most countries -and in the world in general- shows that the pendulum has been clearly switched to the side of a full lockdown of socio-economic life, generating daily costs of all sorts that will pile up in a not too distant future.

It would be harsh, and superficial, to say that the compromise at stake is between socio-economic health and human lives; things are more encompassing than this. Consideration of the two extreme options helps in understanding the depth of the dilemma.

In the case of a total black-out of socio-economic life, economic, social and psychological aspects will be at risk. In the first area, closing down all kinds of services and retailing, including food and entertaining providers, beyond shops and commerce in general, will progressively lead to absence of revenues in the final consumption sector, with backwards effects on all kinds of suppliers, financial intermediaries -like credit cards systems and bank loans, ancillary contracts and services -like renting, and utilities as water and energy and, crucially, higher unemployment and penniless citizens.

In economies where tourism plays a key role, like in Lisbon and a few other Portuguese cities, Paris and the French tourist industry, not to mention Italy and Spain, and in big countries as Brazil or the US -where different options, spread along a significant part of the territory, exist- damaging effects can quickly appear. Moreover, in the Brazilian case, but also in several European areas, tourism opens doors to manifold underground economy tasks, providing jobs to people otherwise left outside the system, if not prone to engage in criminal activities.

Lack of cash, as salaries are not paid, leads to additional break of contracts, hunger and unpredictable behaviour. In unequal societies this may escalate into socially disruptive behaviour and violence.

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[1] In Section 2, in the lecture by Surico and Galeotti (2020), a number of different schemes is discussed.

From a macro side, the default of an aggregate of small contracts may provoke that of a larger one or of businesses and institutions themselves. Small businesses are particularly sensitive to the availability of cash.

From a sectoral perspective, iteration of the vicious composition of a demand and a supply shock, or vice-versa depending on the sector, will inevitably shift the equilibrium to a higher prices-less quantities situation.

Public funds and loans may come into play, but this needs careful planning and distribution as, it must be reminded, the economy is not generating revenues and money is not circulating. Their price will sooner or later be charged on societies as a whole.

In the event that things get better, which legal framework will back up the return to normality and the equating of the diverse debts and defaults? How complex contracts will be dealt with? Will there be a special chamber or facility for the resolution of disputes related to them? Will *force majeure* be allowed to be claimed in most conflicts?

But more must still be added: the absence of basic individual welfare rights and freedoms has, in a fairly short time, consequences on people's behaviour and their ability to comply with the very restrictions. If at first fear guides obedience, in a handful of weeks other little or big problems pop up, accidents of all sorts may take place -with oftentimes solutions hindered by the lockdown, annoyance and changes of mood start to surface and questioning of some of the risk-averting attitudes starts. The psychological set-up may change, the compromise implied by the precautionary "sacrifices" may be put into question.

Like when stretching a thin rope, *time and intensity are key variables here and the longer the duration of total confinement and lack of minimal opportunities for personal outlet and revenue, the worse the psychological state of the crowd and the greater the likelihood of disruption of all kinds*, then naturally fed into a vicious feedback mechanism by the economic quagmire.

In the extreme opposite, leaving the epidemics in full-fledge will likely increase the number of final deaths, enhance chaos in the public health system but speed up the settling of the virus in epidemic terms, with its quick spread throughout the population, most resistant to it. Contagion, being larger, will faster adjust the population to immunity and equilibrium in terms of serious cases; other costs of all sorts and the probability of manifold disruptions will be lower.

This short view of the links and repercussions, against a certainly not ideal alternative, seems enough to show that a compromise is dearly needed, though the sectors, dimensions and interrelationships involved in it demand careful design, as well as the prescribed measures themselves.

In the absence of better information, particularly on the estimation of duration and the sure set of signals that guarantee a steady state, what can be done?

4. What does this all mean?

The key point is that, if option is for the strictest possible precautionary kit, governments and several social agents, independently of those involved in fighting the epidemic, must continuously engage in devising measures to avoid total paralysis, economic and social. Room must be given to the simple and blunt fact that, but for extremely grave periods*, duly perceived*, adult citizens in a free society must have a minimum right to choose their behaviour.

Should shopping centres be closed for several weeks? Do all shops must be shut? Can't a reduced opening-hours regime be implemented? Must *all restaurants* be *all day* closed? If yes, for how long? What about transportation -and the classical contagion environment of public transport? What key factories should be helped -those of durables, expected to be highly affected by the coming recession? How to preserve fundamental value chains?

How will the State intervene? How to allocate disposable funds? What are going to be the taxes and fiscal deadlines & policy during the stricter period and in the following months, or year?

Moving to the international side, what co-operations and joint actions should be encouraged[1]? How to sustain trade flows, and other key economic flows at minimum risk? Which policy must be applied to international air transport and the airports system during these times, beyond a somewhat arbitrary full closure?

What are the signals that will be used as evidence that the situation is improving and controls and enforcement can be made lighter? Are relevant and telling signals being monitored or will signs of defeat and failure be used instead, like less hospital overcapacity & chaos?

The number of questions is much bigger still, and answers lack for their greater part, but the ability to pose them is an essential first step. Together with the strictly sanitary measures, deep thought and close attention must be given to them, at the risk of the rigorous solution being implemented to backfire in extremely severe menaces to the whole of society. In all this, timing and duration of policies is perhaps the hardest challenge.

4. Conclusion.

Though restrictive measures may be imposed for a given period on a social group, they must be so for a short time and never forget that focus on only one problem, the hardest it might be, inevitably disregards myriad others that may charge their toll afterwards, if not immediately.

The Western world is facing an epidemic still largely unknown and, up to now, two things emerge:

i) the numbers, if trusted they must be, do not show much progress yet in coping with the crisis. Moreover, they are imprecise and important decision parameters are missing;

[1] Ironically, up to now in Italy, substantial aid has come from China, Russia and Cuba, not from her EU partners… (see *ISPI Speciale coronavirus, 'Arrivano i "nostri"?'*).

ii) nearly all Western countries have opted for an extremely rigorous portfolio of precautionary measures, treading the very border of basic civilian freedoms and drastically stifling the functioning of the economic system.

At the same time, there is no clue on the duration of the strict policies that have been adopted. Together with this, most leaders and policy makers seem or pretend to be unaware of the broad scope of the socio-economic compromise at stake[1].

This is extremely grave.

A pledge is here made for a more encompassing view on the issues at stake and a call for, alongside the mostly needed state help in such circumstances, a creative organisation of social groups and leaderships to promote patterns of behaviour not leaving aside the multiple aspects of socio-economic life, besides the central target of preserving one's life in the face of a new virus.

A first measure, important for managing expectations, is to set deadlines for the toughest precautionary measures, even if with a proviso that they may be renewed -a transparent proviso, assessed by available published data[2].

A second is the establishing of as many as possible 'Corona Testing Centres', or rather Booths. As the WHO rightly emphasises, testing is the key preliminary action to master contagion, identifying the next-serious cases as well as the asymptomatic ones, and providing the background for wiser precautionary policies. Brazilian large metropolises, for instance, have a very successful story of random testing booths for checking drivers' alcoholic levels; an experience that could be adapted for the corona testing.

Closely related to the latter, more, better and deeper statistics are needed. Without clever analyses of the data, finer individual measurements and careful screening of the time series, no policy can be improved and many good ideas are not feasible. Decent statistical offices exist in many countries and, together with university and research centres, they should be engaged in a data-task force on the framing of the epidemic. International co-operation and information exchange are a must here.

The blunt continuation for more than two or three extra weeks from today, of the precautionary packages that have been enforced in most countries, may start to provoke disruptions of varied sorts, despite the fear-factor that nowadays helps in their gaining acceptance.

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[1] Among a few exceptions are Germany's PM Angela Merkel March, 19 (TV) speech to the people, and the Portuguese PM Antonio Costa's TV speech a few days before. California's Governor Gavin Newson provides another example of conscious and responsible addresses.

[2] The fact that proxies will be unavoidable -total daily deaths the first one, probably- does not necessarily imply they will not be useful.

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