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Our last speaker will provide us with a few thoughts about how Europe is preparing for the next pandemic. The speaker is Jacques Biot, former Director of the École Polytechnique in France.

Jacques, the floor is yours.

Jacques Biot

Ladies and gentlemen,

It is an honor and a pleasure to be part of this panel on pandemics preparedness, and I wish to warmly thank Thierry de Montbrial for his unwavering consideration and for his invitation to speak here. As always, this WPC proves to be a fascinating and inspiring event and I learn a lot from other panels. I also want to compliment the team for the perfect organization, and to thank our panel Chair, dear Michel Kazatchkine, for trusting me to address the European section of the subject.

Prior to my intervention, I state that I have no conflict of interest with the topic I've been asked to cover, and views expressed here are my own and do not imply any organization to which I am related.

My talk will consist of three parts. In a first stage I'll endeavor to identify which lessons have been learned from the European management of the COVID-19 pandemics. I will then list the ingredients of pandemics preparedness. In a third part we'll try to assess Europe's Key Performance Indicators (KPIs) relative to these various ingredients, and we'll come to a conclusion.

How did Europe fare with COVID-19 comparatively to other parts of the world? Looking at graphs borrowed from the Johns Hopkins Coronavirus Resource Center, focused on the 20 most affected countries in the world, showing the mortality / 100'000 inhabitants, and the case-fatality ratio (in other words the lethality among infected subjects), we see that European countries performed in the average in terms of mortality, significantly better than the US, but not as well as Asian countries such as South Korea and Japan, where collective discipline is part of the culture, and which were geographically easier to isolate. On the lethality indicator, most European countries, especially in West-Europe, were able to mitigate high morbidity

ratios and to contain the case-fatality ratio in the lower end, a tribute most likely to be paid to the efficacy and limitless commitment of their health professionals in hospitals.

However, if we were to look into more detailed data, not limited to 20 countries shown on the graphs, we would see that several smaller countries, especially in Eastern Europe, were badly affected. Overall, we would observe that there was a wide disparity of performances relative to morbidity, lethality and resulting mortality on the continent, which could lead us to determine that 'there was no such thing as Europe'. And this was illustrated very significantly, at the beginning of the epidemics, by the relative indifference of neighboring countries vis-à-vis our Italian friends when the virus was exacting a huge toll in human lives in Lombardia.

Such a pessimistic view would be far too pejorative and would miss a major, and decisive, success of the European Union, namely the centralized vaccine procurement scheme, which was instrumental in allowing all our populations to access immunization as soon as vaccines became available, thus avoiding internal competition and ineffective or inequal distribution.

Looking into the future, what are the ingredients needed to be well prepared for a next pandemic? The projected slide is borrowed from the European Center for Disease Contral (ECDC) and shows the various steps, from 'anticipation' to 'response' until 'recovery', which should be mastered by human societies. My contribution here will be to put practical words on this theoretical scheme.

First of all, let us keep in mind that the bug responsible for the next pandemic will not necessarily be identical to SARS-CoV 19. Michel Kazatchkine rightly observed that such a future pandemic is certain and the only question is 'when will it happen?'. I would add 'how will it happen?'. The transmission route may be airborne, but could also be contact-driven, or vector-borne, or disseminated by water, among others, and the interhuman rate of transmission will be unclear at first. Looking back into the history of epidemics – plagues, cholera, typhoid, smallpox, or the mysterious cocoliztli epidemics which took away between 27% and 80% of the Mexican population in the mid-16th century, none of them was airborne. Another unknown is whether the disease will be susceptible to humoral immunity and thus easily controllable by a vaccine. Retrospectively, mankind was lucky, in addition to being talented, to be able to develop an effective vaccine against Sars-Cov-19, and we should remember that other, trickier infectious agents, such as HIV or the malaria parasite, or even the dengue virus, have been able to elude vaccinal protection for decades in spite of intensive research.

With this in mind, which are the public skills that should be mastered to anticipate and control an epidemic? The mix of skills will of course depend on the type of measures needed to test, trace, contain, protect against, and provide care for the disease, such mix depending on the transmission route and on infectivity/lethality ratios.

One would immediately think of the need to maintain research teams savvy in epidemiology and infectiology. But pandemics management is not just a life science issue. Governments and administrations will need to engage all sorts of skills:

- law and order if lockdowns are necessary,

- logistics if stockpiling of protection is needed,
- public information to disseminate instructions,
- effective and cybersecure IT tools across the board, some to collect data on the progression of the disease, some to combat the inevitable disinformation from social networks
- vaccine and/or treatment design, development, production and procurement skills
- and a solid economy, to start with, to fund public health expenses and compensate the deleterious impact of the situation on gross domestic product 'whatever it takes'.

In this respect, how would we rate Europe's Key Performance Indicators?

In the field of epidemiology, while we can still be proud on outstanding research teams such as Antoine Flahault's in Geneva, we must admit that the deglobalization which is at work all over the work as a result of the US-China competition in the field of industry, is also happening in science, with more and more hurdles being put to exchanges between scientists for political reasons. In the specific discipline of public health, this may be particularly detrimental to a quick and efficient assessment of the characteristics of a novel epidemic. Unfortunately, there is not much that the EU can do to reverse this fragmentation trend, except to maintain equal distance to conflicting powers and encouraging by any diplomatic means a return to multilateralism.

In terms of organization, the EU would face a certain number of coordination issues resulting from its constitution as the union of 27 countries. Like for every geographical zone, a coordination should be ensured with WHO's vigilance and issuance of recommendations. But subsequent evaluations and decisions at the continent level would have to be coordinated between a number of players. The EU itself has created 2 institutions:

- ECDC, the European Center for Disease Prevention & Control, to a large extent mirroring the famous US CDC, the mission of which is' to identify, assess and communicate current and emerging threats to human health from communicable diseases', and
- HERA (Health Emergency Preparedness & Response Authority), an internal Commission service, in charge of 'ensuring the development, manufacturing, procurement, and distribution of key medical countermeasures (MCMs).

While it seems obvious that the Commission took care of avoiding confusion, with the first one addressing rather the medical side, ant the latter the logistical side, overlapping between their respective responsibilities is not unlikely. ECDC's programming document includes a chapter entitled 'Support countries in emergency preparedness and response'. The European Medicines Agency EMA would also be mobilized to diligently approve potential treatments.

Assuming these organizations collaborate properly, they will have to interfere with the Commission's Health commissioner, who does not necessarily have a medical background,

and decisions would have to cascade down to national states, with regard to the subsidiarity rule which till now has not placed healthcare within the mandate of the Commission.

Within the Commission and mostly within each state, a coordination would ensue between various Ministers and or Agencies in charge of non-medical aspects: Home Office, Foreign Affairs, Economy and Budget, Communication, etc. And finally local authorities would have to implement a large share of the decisions in their constituencies, with a degree of leeway which would have to defined on a case-by-case basis. Potential lockdowns should take into consideration the Schengen setting.

When it comes to proposing and procuring treatments or preventive medicines, the Union would realize that its life sciences and biopharma industries have declined sharply on the global exchequer. Finally, it might have to impose such treatments or vaccines to a population which, to a large extent in certain countries, has developed strong antivax sentiment in the wake of populist ideologies and of social network disinformation, and more generally are suspicious of scientific or political elites.

Finally, keeping in mind that the key to sovereignty and to resilience resides in a strong economy, Europe would enter a new pandemic with less financial mileage, after several years of slow GDP growth, and a fairly high debt/GDP ratio in some of its large countries.

These considerations lead us to a mixed conclusion. Public awareness of the probability of novel infectious agents has undoubtedly risen and the European Commission has taken quite a number of measures to prepare a response to such situations, including the creation of HERA. This should ensure that the indisputable achievement of central vaccine procurement will not be a one-shot performance, but could serve as a precedent in later cases.

However, many bricks would need consolidation in order to reinforce Europe’s preparedness. Public opinion should be appeased in order to avoid the search for scapegoats and the belief in fake news, which can only be achieved by a major effort on public education. Most countries should remedy the profound decay of their public health systems, and the lasting shortage of medical staff. They should also strengthen their economies to be able to resist any financial shock due to reduced activity.

And foremost, a staunch priority for science should be asserted among politicians and decision-makers.

I thank you for your attention.