

HELSINKI COLLEGIUM
FOR ADVANCED STUDIES



**MULTIDISCIPLINARY PERSPECTIVES
ON THE COVID-19 PANDEMIC**

MULTIDISCIPLINARY PERSPECTIVES ON THE COVID-19 PANDEMIC

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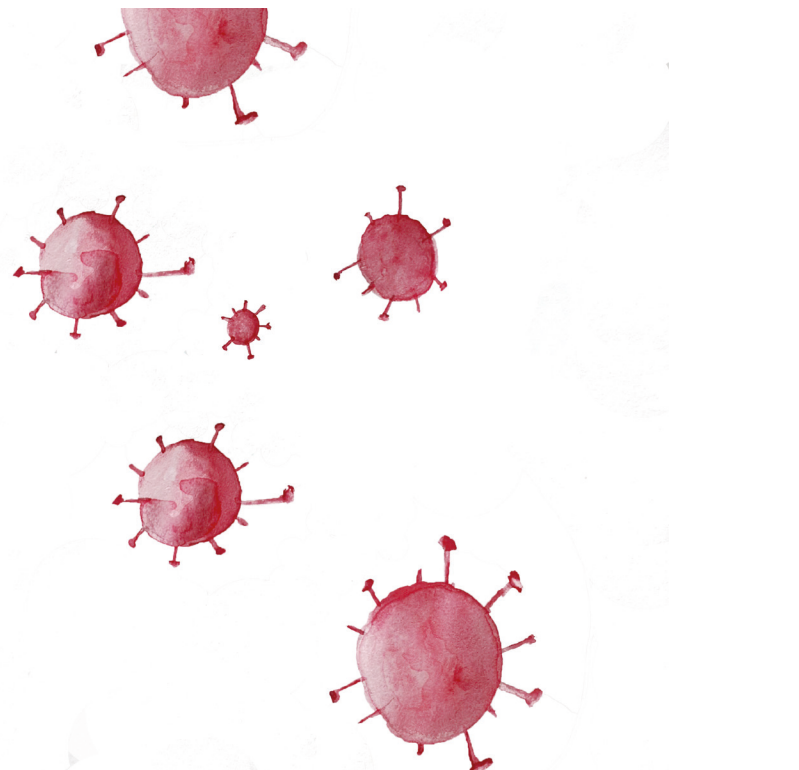
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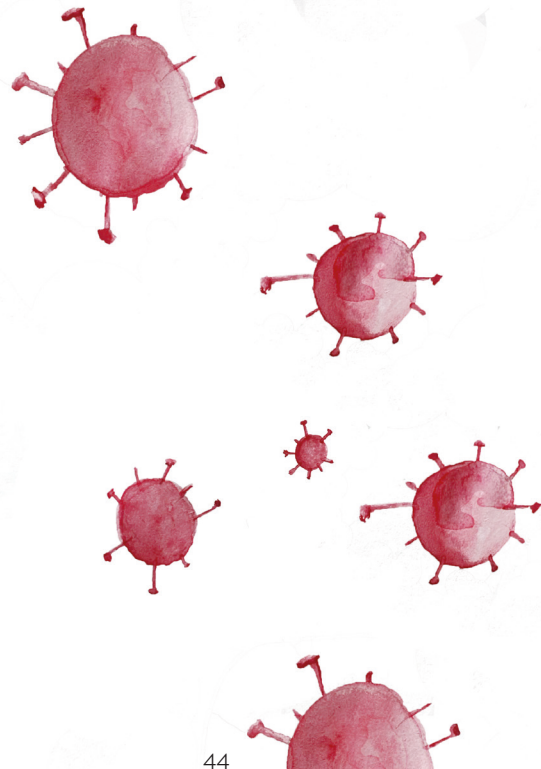
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TUOMAS K. PERNU

COVID-19 AND CONTROL

AN ESSAY FROM A PRAGMATIC PERSPECTIVE ON SCIENCE



Reality is multifactorial. “Everything affects everything”, we say. But we don’t really mean that. That is, what we mean, when we blurt something like that out, is that everything is “connected”, but what we don’t mean by that is that having a hold on some arbitrary thing results in having an equally good hold on any other thing. All of reality might be interconnected, but that does not mean that each of those connections would provide us with an equally good means for manipulating reality.

From the perspective of philosophy of science, the ongoing COVID-19 pandemic is particularly interesting precisely because it has made the fundamentally multifactorial nature of reality apparent and tangible to us all. What is striking about the pandemic, from this perspective, is that, not only can a variety of things be seen to have a bearing on the spread of the disease, but also that different ways of intervening on the spread of the disease result in a variety of consequences, of which some are unintended and potentially negative. Most prominently, it is understood by everybody that while the various lockdown measures that have been implemented all over the world are an effective way to intervene on the spread of the disease (more specifically on the basic reproductive rate, R_0 , of SARS-CoV-2, the COVID-19 pathogen), the unintended – but unavoidable – consequences of implementing such measures are psychologically, socially, economically and politically dramatic. We have witnessed a well-nigh complete, self-imposed shut-down of societies, and limiting of basic rights of liberal democracies, unprecedented in their history. Although the spread of the disease has become contained by implementing these measures, it is understandable if one feels the need to

question the price that has been paid – and that political controversy has ensued.

Put simply, the relationship between reality and science can be described thus: reality is messy, and it is the purpose of the scientific endeavour to make it sensible – to us. That is, it us, people, and our aims and our values that determine which parts of the messy, interconnected reality we should hold as particularly salient – really real, if you will. Some parts of reality are more useful to us, and therefore more worth tapping into, simply because by manipulating them we are able to induce changes in things that we find worth changing. Sometimes, however, no one particular such hinge can be identified, but there are many equally good ways of bringing about the wanted result – which is something that the discussion on the possible responses to COVID-19 has made apparent. But actually, more than that has become apparent: not only do we have a number of different ways of intervening on COVID-19 available to us, but it has also become apparent that there are a number of different results we want, or could want, to bring about with such interventions. For example, although the primary public focus has been on the COVID-19 death-rate – and the aim of public health measures has been assumed to be in reducing that number – several other parameters have appeared in the discussion (e.g. the rate of the infection (R_0), confirmed number of cases in a population, the number of hospitalised cases, the number of intensive care unit cases). Finding an answer to the question how should we respond to the pandemic is not hampered only by the fact that the pandemic is a result of multiple factors, but also by it being unclear what, exactly, should we be responding to.

Consider, for example, our focus on the death rate – the number of people dying of COVID-19. This is arguably an effect of the pandemic that is getting most of the public attention, and understandably so. However, the problem is that this number will not, by itself, tell us how exceptional and easily avoidable these deaths have been. And indeed, the more critical analyses have often shifted the focus from the death rate to the excessive death rate – to the number of people unexpectedly dying – in assessing the severity of the pandemic. But even if we assumed that the notion of “excessive death rate” were wholly unproblematic (which it is not, as it is all but clear what the right reference class for “excessive” is), it is apparent that the variation of such a variable is plagued by confounding factors – most notably by the very public health measures that were implemented to reduce the COVID-19 death rate. That is, striking about the COVID-19 pandemic is how our efforts to mitigate it might lead to worsening of the very issue we have tried to mitigate.

How to unravel this problem? The key conceptual insight is to apply more care in separating the relevant – but ultimately different – possible effect variables from each other. Let us call these target variables. A target variable is not a bare phenomenon of nature; target variables are determined by our choices – choices that we make on the basis of our values and purposes. Target variables are natural phenomena that we have an interest in manipulating. So, for example, death rate due to COVID-19 in a given population, death rate due to COVID-19 in some proper subset of a given population, gross death rate in a given population, the number of people hospitalised in a given population, the number of people in

intensive care in a given population, or the gross national product of a given economy can all function as valid target variables in our efforts to mitigate the consequences of the pandemic (and indeed they all have appeared as such in public discussion). However, each of them is a different target variable – and different in a very precise sense: they are differently responsive to our interventions. The death rate due to COVID-19 in a population is responsive to applying COVID-19 lockdown measures to that population, for example, but the gross death rate in the same population might react in the opposite way (due, for example, the traffic-related deaths reducing dramatically).

We cannot escape the fact that the nature is fundamentally multifactorial, and we cannot erase all the confounders having an effect on the variables that are of interest to us. What we can do, however, is to make it clearer to ourselves what kind of results we wish to achieve. And this, in turn, will guide us to focus our attention on those factors that will help us to achieve these results in the best (most accurate and robust) way. Let us call the variables that correspond to such factors as control variables. That is, we can assume that for each target variable there exists a number (typically more than one) of control variables the variations of which are reliably correlated with variations of the target variable. And further, we can assume that we can give a precise ordering for such variables; that there exists, in other words, better and worse ways of controlling a given target variable. So, even if we admit that reality is fundamentally multifactorial, we can still find more or less effective ways of harnessing it – given that we have first made it clear to ourselves what exactly we find worth harnessing.

Science in general can now be described as a pragmatic project which proceeds in two steps. First, a target variable is specified – a phenomenon that we (a variety of people engaging with the sciences) wish to measure and make amenable to our interventions. Second, a control variable is defined – a factor that corresponds to the given target variable in the best possible way. Consider now this view on science in the context of the COVID-19 pandemic. Let us make the natural assumption that we want to prevent as many deaths from occurring as possible; every death is unwanted. We therefore have – prima facie at least – our eye on the gross death rate (in some population of interest): the lower the number of deaths, the better. Now, the problem, as it was already observed, is that the gross death rate pools together a variety of cases and is a result of numerous factors that are linked together. Suppose, then, that we want to aim our efforts at reducing the death rate due to COVID-19 (a proper subset of the gross death rate), and suppose that we impose social distancing and other societal restrictions to achieve that end. Again, however, we are faced with unwanted results (of psychological, societal, and economic in nature): imposing such measures is not an optimal way of controlling the chosen target variable. But suppose a vaccine is developed; suppose, in other words, that we develop effective means for intervening on the very biological basis of COVID-19. Now it would seem we would have finally found an optimal (accurate and robust) way of controlling the pandemic (with the proviso of possible unwanted side-effects of the vaccine). This is the reason why a COVID-19 vaccine is generally taken to be the ultimate way out of the pandemic – and

why indeed we have developed bio-medical means of intervening on diseases in general.

We easily have an overly straightforward and omnipotent view on science. We should have trust in science, of course, and the recent rise in the public interest in the research related to the pandemic has been very welcome indeed – after the dark years of “alternative facts” and general distrust in science and the academia. But often the public discussion, and the wishes of the political decision-makers in particular, is based on a distorted view on science. There is a demand for control – for effective means of controlling the pandemic and all its repercussions, and for someone to assume that control. Although science – in this case, particularly epidemiology and other bio-medical sciences – can help us to achieve our goals (to the extent that they are achievable), science itself does not determine those goals. It is left for us – for the public discussion and political decision-makers – to decide what goals we want to pursue. Although this applies to science, and our relationship with it in general, we are often not conscious of it, as there is often no explicit conflict between the variety of goals that science can help us to achieve. What the COVID-19 pandemic is a healthy (!) reminder of, however, is that such conflicts can, and often do, exist. A variety of tough decisions have had to be made, both at the level of frontline healthcare work, and at the level political decision-making. In doing so, the relevant sciences have been consulted to exhaustion, and they have given us the best possible tools for controlling the course of the pandemic and mitigating its consequences. But what the sciences have not given us, are the values on the basis of which we choose to pursue one goal at the cost of another.



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