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Science, Trust and Justice: More Lessons from the Pandemic¹

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¹ I would like to draft Gürol Irzik for comments on an earlier draft of this paper.

Take a question like the safety and effectiveness of COVID-19 vaccines. Whether an ordinary citizen or a public official can acquire the correct answer to this question depends on the functioning of the epistemic basic structure of their society. *The epistemic basic structure of a society* consists of “the institutions that have a crucial role in *the distribution of knowledge*, that is, in the production and dissemination of knowledge, and in ensuring that people have the capability to assimilate what is disseminated by providing them with the necessary educational background and intellectual skills” (Kurtulmus and Irzik 2017, 129). It includes institutions of science and education, the media, search engines, libraries, museums, think tanks, and various government agencies.

Regarding the Epistemic Basic Structure

The concept of the epistemic basic structure and the analytical distinction between its main functions, which together determines people’s opportunity to acquire knowledge, provide a diagnostic tool. When people fail to acquire the correct answer to a question they have an interest in, such as the effectiveness of lockdowns or vaccines, we can ask the following questions.

1. *Production*: Is there well-conducted and reliable research about these questions?
2. *Dissemination*: If so, have the findings of this research been disseminated? Can people access these findings? Have the results of research been presented in a way that people can comprehend and evaluate? Have these findings been presented by sources that people can trust? Have steps been taken to help people identify reliable sources?
3. *Assimilation*: Have people been provided with the requisite educational background and intellectual skills to understand and evaluate the findings disseminated to them (Kurtulmus and Irzik 2017, 135)?

Guided by these questions, we can determine where the epistemic basic structure of a society has failed citizens and where we need to make improvements.

In “Epistemology and the Pandemic: Lessons from an Epistemic Crisis” Petr Špecián conducts such an inquiry into the failure to effectively respond to the pandemic in Czechia. He suggests that the response to the COVID-19 pandemic in Czechia was hampered by an “epistemic crisis”: “a breakdown in the social division of epistemic labor, compelling the citizens to revert to the ‘naïve’ epistemology of common sense and personal experience” (Špecián 2022, 167). The public failed to make use of existing expert knowledge that would enable an effective response to the pandemic. This happened, not because the relevant knowledge was missing or because the public was irrational. The fault lay with the process of knowledge dissemination. Members of the public faced serious obstacles in identifying the

right experts because of the failures of institutions responsible for disseminating knowledge to the public.

Špecián identifies three obstacles people faced when trying to determine which experts to rely on. First, the answer to the question “What is the relevant domain of expertise when formulating a policy response to COVID-19?” was not clear. Should one consult doctors or epidemiologists? Or, perhaps anyone with expertise in making causal inferences, including economists? In Czechia, it was frontline medical professionals, who compared to epidemiologists underplayed the severity of the pandemic, that the public paid most attention to. Second, the criteria that the public could rely on to identify which experts to trust in cases of disagreement among them were not sufficient to help them decide. Experts who favored and experts who opposed a cautious approach to the pandemic were similarly credentialed. They did not differ in terms of their exposure to conflicts of interest. Comparing their track records also did not produce a clear verdict. Third, the meta-experts that the public could rely on to help them identify the experts, the media and the government, were compromised by conflicts of interest.

According to Špecián, the failure of knowledge dissemination, which led to an epistemic crisis, cost many lives. To be better prepared for the future we need to build institutions of knowledge dissemination that will enable members of the public to identify the experts and make use of existing knowledge in society.

In his paper, Špecián makes two crucial assumptions: the knowledge that people needed to better respond to the pandemic existed and people were not irrational. As he concedes, these assumptions may be questioned. However, this does not weaken the paper’s argument but strengthens it. The paper, in effect, shows that unless the channels of knowledge dissemination work properly members of the public will fail to benefit from existing knowledge in their society through no fault of their own. Thus, the paper demonstrates the necessity and importance of having a well-functioning institutional framework of knowledge dissemination.

Given its goals, Špecián’s paper does not address the production of knowledge or questions of distributive epistemic justice that bear on both the production and dissemination of knowledge. In this short note, I want to explore these questions in relation to the pandemic.

Two Duties of Justice

The epistemic basic structure of a society has two duties of justice. First, it should serve citizens fairly and provide them with the opportunity to gain knowledge they need to deliberate about and pursue their personal good and the common good. Second, it should produce and disseminate the expert knowledge necessary for the design and effective implementation of just laws and policies (Kurtulmuş 2020, 819).

Discussing distributive epistemic injustice in the context of science, we distinguished between two corresponding injustices (Irzik and Kurtulmuş forthcoming).

Primary distributive epistemic justice is concerned with the knowledge ordinary citizens need. It requires that science produce reliable research that meets knowledge needs of all groups in a society regardless of their race, ethnicity, class, religion, and gender. If a society has the necessary resources but its scientific institutions do not provide knowledge people have an objective interest in or does so unfairly, giving undue priority to some over others, then the ensuing deprivation of the opportunity to acquire knowledge itself constitutes a primary distributive epistemic injustice.

Secondary distributive epistemic justice is concerned with the production of scientific knowledge public officials need for carrying out their tasks required by justice, such as providing health care, designing and implementing effective social and environmental policies, and maintaining a fair legal system. Injustice in this context arises when public officials commit or fail to remedy injustices because of a lack of scientific knowledge due to the poor or unfair social organization of scientific research.

Both injustices arise when scientific research neglects certain interests. Thus, the practice of excluding women subjects from medical studies, for instance, meant that women and doctors treating them lacked knowledge about the effects of various medical interventions on women (Dusenbery 2017; Criado-Perez 2019; Schiebinger 2020).

The recent literature on the role of non-epistemic values in science suggests that these injustices arise in more subtle ways too. This topic has initially been discussed in the context of “inductive risk”. When we accept or reject an hypothesis on the basis of evidence, there is always the possibility of error. We can erroneously accept a false hypothesis or reject a true hypothesis. Accepting or rejecting an hypothesis on the basis of a given body of evidence requires weighing the consequences of these kinds of errors (Rudner 1953; Douglas 2009).

Drawing inferences on the basis of evidence is not the only site of error in the process of scientific inquiry. As Biddle and Kukla point out the operationalization of concepts, deciding whether to include or exclude borderline data points, various decisions in modelling, and setting diagnostic criteria all contain risks of error and require value judgments (2017, 220-1). For this reason, they introduce the broader category of “epistemic risk” that encompasses “any risk of epistemic error that arises anywhere during knowledge practices” (Biddle and Kukla 2017, 218).

The allocation of epistemic risks in scientific research can cause both primary and secondary distributive epistemic injustices. If, for instance, scientists do not consider the harms of error for certain groups in their research that will guide policy or will be used by individuals this neglect will be an injustice.

Secondary Distributive Epistemic Injustice: “Report 9”

I want to briefly consider questions of secondary distributive epistemic injustice that arise in research that guided public policy during the pandemic. In particular, I want to explore

“Report 9” by the Imperial College Covid-19 Response Team, which played a significant role in policy making in the UK—and, more indirectly, elsewhere too—from the perspective of distributive epistemic justice.

When introducing the concept of epistemic risk, Biddle and Kukla note that models also embody epistemic risk and value-laden choices. In a recent article, Harvard and Winsberg sharpen this idea by introducing the concept of “representational risk” (2022). Building models involve value-laden decisions about “‘what to represent’ (i.e., decisions about what entities to include in and exclude from a representation) and ‘how to represent’ (i.e., decisions about entities already chosen for inclusion in the representation)” (2022, 2). These decisions bear on how adequate or inadequate a model is for the purpose that the model is used for.

The policy responses to the pandemic give rise to issues of distributive justice, because the disease does not pose the same risk on all people and the benefits and burdens of policies to slow its spread are not the same for everyone. Holding all else constant, the younger you are the less likely you are to die from the virus if infected. The different non-pharmaceutical interventions (NPI’s) that can be used to reduce the transmission of the virus also pose differential costs on people. School and university closures have a greater impact on the young and people with children. The education of the children of those who are better off is likely to suffer less than those of the worse off. Economically, people with jobs that can easily be moved online are less affected from lockdowns than those for whom this is not an option. Some groups are better sheltered from the long-term economic repercussions of lockdowns than others.

“Report 9” by the Imperial College Covid-19 Response Team which had a direct impact on the UK response to the pandemic illustrates the relationship between modelling choices and questions of distributive epistemic justice (Ferguson et al. 2020). The aim of the report was to assess different NPI’s that could reduce the spread of the virus. The report compared strategies of mitigation, which aimed to slow down the transmission of the virus, with strategies of suppression aimed at reducing the reproduction number to below 1. It concluded that “epidemic suppression is the only viable strategy at the current time” (Ferguson 2020, 16).

There are two kinds of value-laden choices in the model that stand out. The first, in line with Harvard and Winsberg’s analysis, is the choice of what to represent. The model represents three outcomes under different NPI’s: number of cases, number of deaths, and number of critical care beds occupied and how this last number relates to existing capacity. While recognizing that the interventions can have economic and social costs, the report does not offer any estimates of these. These choices regarding what to represent highlight some costs and benefits of NPI’s and obscure others.

The second kind of choice concern the values for the hundreds of parameters in the model for many of which the modelers lacked good estimates (Winsberg, Brennan and Suprenan 2020, 225). Under these conditions of high uncertainty, the assignment of values to

parameters were likely to reflect value judgments. Here is how Winsberg, Brennan and Suprenan put it:

... [C]onsider the ICL model and the choice of value for the parameter representing the probability of infection transmission at home while socially isolating. If you assume that the probability of getting infected at home goes up by 25% while socially isolating, this makes social isolation look far more attractive than if you assume that the probability of getting infected at home goes up by 35% while socially isolating. If you think that social isolation is the more prudent policy, because you think that risking losing lives to disease is a more serious risk than risking losses to the economy or to political freedoms, this may be reason enough to choose the former specification. The reader might think this is a small change. And indeed, maybe it is. But a model with almost 700 such unconstrained choices, each of which produces non-linear effects on the model output, creates a highly flexible model (2020, 228-9).

In other words, there is the possibility that certain policy choices were inevitably baked into the model that informed policy.

The pandemic was “a high-stakes, high-uncertainty issue, where evidence was scant, the science not settled, and political decisions were urgent” (Pamuk 2021, 194). These factors made questions about values guiding scientific research salient. The different courses of action that could be pursued in response would place different distributions of burdens and benefits on different people, thus raising questions of distributive justice. The direct impact of the Imperial College Report on public health policy also made it special. Its decisions regarding what to represent and what to exclude in the model, which were understandable given the question the modelers were set, became more problematic because they contributed to the exclusion of various considerations from the policy making process that depended primarily on it.

This is far from establishing that the ICL report was an instance of secondary distributive epistemic injustice. To do that one would both need an account of what justice requires in this context and an in-depth study of choices made in the report.² Nevertheless, given that justice wasn't aimed at, it would be an unlikely coincidence if the report fulfilled the requirements of justice. To be better prepared for the next such crisis we need to think carefully about what justice requires in such contexts and how the requirements of justice can be incorporated into scientific practice.

Scientific Values and the Laypublic

² The issue of responsibility and culpability would require further argument. Suffice to note that, in light of the task they were given by the government, it cannot be wholly laid at the door of the scientists who prepared the report. When thinking about distributive epistemic justice in science, we need to be primarily thinking about the institutional framework rather than individuals. The same piece of research that gives rise to an injustice in one context can be innocuous in another.

Špecián shows that laypeople faced many obstacles when trying to identify which experts to rely on. Reflecting on the role of values in science and how value choices in scientific research raise issues of distributive justice brings to the fore further challenges laypeople face.

Here, it's helpful to distinguish between two kinds of epistemic trust in science: basic and enhanced (Irzik and Kurtulmuş 2019). The challenge in having well-placed *basic trust* in science is identifying the scientists who are competent and truthful. This is the problem Špecián discusses in his paper. A society that overcomes the problems Špecián has identified would be one that has helped its members attain basic trust in the science that informs policy.

Given that scientists have to make various value-laden choices in their research, laypeople will also need to identify scientists whose assessment of epistemic risks match theirs. This is the challenge of well-placed *enhanced trust*. In certain cases, such as the claims made by the Intergovernmental Panel on Climate Change, this is not a problem, because the science is highly certain (John 2017). However, when the science is uncertain and there are many value-laden choices to be made, enhanced trust becomes an urgent and difficult problem.

The scientific research that informed public policy during the pandemic, such as the ICL model discussed above, is illustrative. There are two requirements of well-placed enhanced trust in this context. First, the public's assessment of the epistemic risks bearing on the model and those of the modelers should be aligned. If, for instance, scientific research is primarily concerned with not underestimating deaths that could result from a policy but the public wants other values to be also taken into account, then the public cannot have well-placed enhanced trust in the science that informs policies.³ Second, the public should have reasons for believing that there is such an alignment. If the public's values are incorporated into research but the public cannot see this, then they won't be able to have enhanced trust in the science that informs policies. As a result, there can be cases where the public refuses to comply with some scientific advice even though the challenge of bringing about basic trust has been overcome.

Assessing Knowledge Dissemination

In concluding his article, Špecián issues a call for interdisciplinary thinking about “the institutional underpinning of knowledge dissemination” (2022, 175). I concur fully with his assessment of the difficulty and urgency of this task, and the need for drawing not just from philosophy but also the social and behavioral sciences. I would only add that, we should not think about dissemination alone but also pay attention the rest of the epistemic basic

³ There is a further problem, that I only flag here: if it's the public's unreflective views, which are not responsive to the requirements of justice, that are reflected in research, then it's obviously not an entirely welcome result.

structure, including the production of knowledge. And we should do this with an eye to the requirements of justice.

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