***The WHO and the ‘Whose Values?’ Problem: On the Partial Democratisation of Science***

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**Abstract:** That science is value-dependent has been taken to raise problems for the democratic legitimacyof scientifically-informed public policy. An increasingly common solution is to propose that science itself ought to be ‘democratised.’ Of the literature aiming to provide principled means of facilitating such, most has been largely concerned with developing accounts of *how* public values might be identified in order to resolve scientific value-judgements. Through a case-study of the World Health Organisation’s 2009 redefinition of ‘pandemic’ in response to H1N1, this paper proposes that this emphasis might be unhelpfully pre-emptive, pending more thorough consideration of the question of *whose* values different varieties of epistemic risk ought to be negotiated in reference to. A choice of pandemic definition inevitably involves the consideration of a particular variety of epistemic risk, described here as *ontic* risk. In analogy with legislative versus judicial contexts, I argue that the democratisation of ontic risk assessments could bring inductive risk assessments within the scope of democratic control without necessitating that those inductive risk assessments be independently subject to democratic processes. This possibility is emblematic of a novel strategy for mitigating the opportunity costs that successful democratisation would incur for scientists: careful attention to the different normative stakes of different epistemic risks can provide principled grounds on which to propose that the democratisation of science need only be *partial*.

**Keywords:** Democratised Science | Values in Science | Inductive Risk | Ontic Risk | Scientific Classification | Public Health

1. **Introduction**

That socially consequential science is in some respects value-dependent is no longer a contentious claim. This has been taken to threaten the democratic legitimacy of scientifically-informed public policy: if science requires value-judgements, and those judgements do not accord with the values of the public, then the use of scientific results in policymaking contexts seems liable to threaten the public’s right to collective self-government. Hence, the question of ‘whose values?’ science ought thus to depend on is often answered with an appeal to democracy.

Of the available literature on ‘democratised science,’ the bulk has been largely concerned with developing accounts of *how* public values might be identified and deployed to resolve scientific value-judgements. Amongst these, we can distinguish two broad strands, differentiated by their conceptions of democratic legitimacy and the political decision-making structures each subsequently propose. The first are *majoritarian* approaches, which suggest that scientific value-judgements ought to be determined by the values most commonly held amongst a population, whether this regards the outright majority public (Schroeder 2021, 2022), or a politically-salient subgroup thereof, i.e., ‘stakeholders’ (cf. Intemann 2015). The second are *deliberative* approaches, which contend that scientific value-judgements ought to be decided through processes of structured political disputation, typically between scientists and public representatives or stakeholders (Pamuk 2022; Lusk 2021).[[1]](#footnote-1)

Both varieties of democratised science face a central feasibility concern: meeting democratic expectations is a difficult and involved process, even in traditional political venues. Meanwhile, wider literature on the role of values in science has aimed to show that value-judgements are ubiquitous throughout all stages of inquiry (Elliott 2017; Biddle & Kukla 2017). Given both difficulty and ubiquity, holding scientists accountable to democratic decision-making processes seems liable to incur substantial opportunity costs, to the detriment of effective research. The desiderata of democratic legitimacy and effective research seem therefore in tension.

There are, broadly, two available strategies for blunting the horns of this dilemma: we might minimise the difficulty of meeting democratic expectations, or minimise the range of scientific value-judgements that demand democratisation in the first place. Proponents of democratised science have tended to prefer the former: Andrew Schroeder (2021: 559), for instance, proposes simple mechanisms by which democratised science might be *approximated* without necessitating detailed political engagement from scientists. The latter strategy remains underexplored. As Faik Kurtulmuş (2021: 144, emphasis added) observes, it seems reasonable to anticipate that “calls for [the] democratisation of science can demand not full but *partial* democratisation, and do so on principled grounds.” But a principled basis for the partial democratisation of science has yet to be developed, and how we might differentiate those value-judgements that *do* demand democratic input from those that *don’t* remains unclear.

My goal in this paper is to make some headway towards a strictly partial proposal for the democratisation of science. The core of my argument is that careful attention to the diverse and interrelated normative stakes of different epistemic risks can yield more *efficient* proposals for democratisation, because requiring that all varieties of epistemic risk be negotiated in reference to public values does not always meaningfully expand the scope of democratic control. This is emblematic of a general strategy for clarifying the notion of partial democratisation: by identifying discrete varieties of epistemic risk that do (and don’t) demand direct democratic input.

I make my argument in reference to the World Health Organisation’s [WHO] 2009 redefinition of ‘pandemic’ in response to H1N1.[[2]](#footnote-2) A choice of pandemic definition connotes a particular variety of epistemic risk, described here as *ontic* risk in accord with Andrew Buskell (2021) and Joeri Witteveen (2021). In differentiating ontic from *inductive* risk, it becomes apparent that we might want different answers to the ‘whose values?’ question, and commensurately different decision-making procedures, for different varieties of epistemic risk. Through analogy with legislative versus judicial contexts, I argue that the democratisation of ontic risk assessments could bring inductive risk assessments within the scope of democratic control without necessitating that those inductive risk assessments be independently subject to democratic processes. This provides principled grounds on which to leave inductive risk assessments out of proposals to democratise science; democratising inductive risk assessments might simply be *unnecessary*.

In section 2, I detail the WHO’s treatment of H1N1 and the decision-making structures that contributed to H1N1’s classification as ‘pandemic.’ Section 3 summarises the majoritarian and deliberative approaches to democratised science, and substantiates the opportunity cost worry faced by both models. In analogy with legislative and judicial contexts, section 4 articulates the distinction between ontic and inductive risk, details some worrying implications of allowing inductive risk assessments to subsume ontic risk assessments, and argues that both deserve independent normative treatment. Section 5 clarifies the productive role that attention to ontic risk assessments might play in securing the democratic legitimacy of science, and suggests that – at least for purposes of democratisation – an emphasis on inductive risk seems counterproductive. Section 6 concludes.

1. **H1N1 and the Structure of WHO**

2.1. *Classifying H1N1*

This section describes the case through which I’ll orient my argument below, regarding the WHO’s treatment of H1N1 in 2009. For my purposes, the case’s key features are that H1N1’s declaration as ‘pandemic’ was intended to trigger global political responses; that the WHO arguably *redefined* ‘pandemic’ in order to facilitate this declaration; that this redefinition provoked significant political controversy, especially because global responses to H1N1 were in hindsight unnecessary; and that any value-judgements made during the WHO’s treatment of H1N1 were made on a discretionary basis by a handful of WHO officials, with no public input or overt political oversight.

H1N1 was identified in March 2009 (CDC 2009) and, with intercontinental spread observed by April, quickly demonstrated high transmissibility (Butler 2009). The WHO declared H1N1 pandemic in June. The WHO has been encouraging the development of intranational pandemic policies since 1999, and although International Health Regulations [IHR] do not permit the WHO to issue binding pandemic response directives, it does require participating nations “to establish, operate and maintain a national public health emergency response plan” intended to interact with WHO pandemic announcements (WHO 2005a: 41). The WHO’s declaration of H1N1’s pandemic status therefore constituted a strong recommendation for global political responses to ameliorate the threats to public health posed by the virus.

The WHO’s pandemic preparedness guidelines invoke a relatively simplistic “description-definition” (Doshi 2011: 533) when delineating the extension of ‘pandemic’ influenza.[[3]](#footnote-3) Their initial 2003 formulation stated that “a pandemic occurs when a new influenza virus appears against which the human population has no immunity, resulting in several, simultaneous epidemics worldwide with enormous numbers of deaths and illnesses” (WHO 2003). H1N1 never caused such deaths and illnesses – it was “overall… very mild,” causing only “sporadic cases of severe [illness]” (Schrauwen et al 2011: 200). But in May 2009, the WHO substituted a truncated formulation, that “an influenza pandemic occurs when a new influenza virus appears against which the human population has no immunity” (in Doshi 2011: 532). WHO communications officer Natalie Boudou (in Cohen 2009) clarified that “the correct definition is that ‘pandemic’ indicates outbreaks in at least two of the regions into which the WHO divides the world.” This updated 2009 account’s extension therefore included H1N1 on the basis of its novelty and geographic diffusion, without any requirement regarding pathogenicity.

There have been claims, on the basis of H1N1’s low pathogenicity and the (in hindsight) unnecessary international response to its emergence, that its classification as pandemic was erroneous (Kamradt-Scott 2018), perhaps motivated by the financial interests of pharmaceutical companies (Mandeville et al 2013). The Council of Europe [COE] (2010: 11), voicing similar concerns regarding competing interests in the WHO, highlighted the updated extension of ‘pandemic’ in preparedness guidelines: “the formal criteria of ‘impact and severity’… in terms of the numbers of infections and deaths was no longer considered relevant in the updated document. In other words, the pandemic could be declared without the need to show that it was likely to be severe in terms of its impact on the population.” The WHO (in Lowes 2010) responded that their preparedness guidelines had never *defined,* but merely *described*, pandemic influenza: “it’s not a definition, but we recognise that it could be taken as such… It was the fault of ours, confusing descriptions and definitions.”

The importance of the WHO’s distinction, between ‘definition’ and ‘description,’ is difficult to substantiate in the context of pandemic preparedness: as the COE’s (2010: 6-11) assessment indicates, IHR-mandated pandemic response plans had been developed with a particular understanding of what a ‘pandemic’ constitutes, which was inconsistent with H1N1’s classification as such. What’s at least clear is that an important change in the WHO’s classificatory standards regarding pandemic declarations occurred in response to H1N1: as Peter Doshi (2009: 2) noted in the *British Medical Journal*, “since the emergence of [H1N1], descriptions of pandemic flu… have changed to such a degree that the difference between seasonal flu and pandemic flu is now unclear.” The WHO (2009: 24) has since maintained that pandemic announcements “only loosely correspond to pandemic risk,” which stands in clear tension with their prior indication that pandemics result in “enormous numbers of deaths and illnesses” (WHO 2003).

For current purposes, then, I will accept the COE’s (2010: 7) characterisation of events: that the WHO redefined ‘pandemic’ in 2009, by removing “criteria relating to the severity of the disease… as a precondition [for pandemic status].”[[4]](#footnote-4) The WHO (2011: 3) has since clarified that their “overarching goal [regarding H1N1] was to mitigate the impact of the pandemic by coordinating… global activities,” and it seems likely therefore that the WHO’s redefinition of ‘pandemic’ occurred because relevant decision-making authorities determined that H1N1’s emergence called for the implementation of pandemic response plans despite H1N1’s then-uncertain pathogenicity. As the COE (2010: 10) surmised, it looks plausible that pandemics were redefined so that H1N1 could fit therein.

2.2. *Who Makes Decisions in the WHO?*

It is clear that deciding the appropriate response to H1N1 was epistemically underdetermined. Some measure of non-epistemic valuing was necessary in determining the appropriate balance between a precautionary mitigative response and the economic and social costs of overestimating H1N1’s threat. But *whose* values contributed to the decision is unclear. Unfortunately, available evidence regarding the WHO’s decision-making processes during the assessment of H1N1 does not yield an empirical answer here. But details of the WHO’s governance structure, and the decision-making authorities regarding H1N1’s classification, will at least render the case normatively tractable.

The WHO is partially governed by a deliberative forum, the World Health Assembly [WHA]. Composed of representatives from the WHO’s 194 member states, the WHA (2008: 130) decides WHO policy positions via “unanimous or… evident majority” consensus, convening yearly. But, although the WHA (2009: v) met in May 2009, regarding pandemics they discussed only “pandemic influenza preparedness [regarding the] sharing of influenza viruses and access to vaccines and other benefits.” The WHA is not tasked with addressing the epistemic contents of public health claims: their purview includes e.g. determining *responses to* pandemics but not determining the *extension of* ‘pandemic’ (cf. WHO 2022a).

IHR states that the WHO’s (2005a: 14) “Director-General shall determine… whether an event constitutes [a pandemic] in accordance with the criteria and the procedure set out in [IHR].” Procedure mandates the consideration of all available evidence, and the advice of an Emergency Committee, which are established upon the emergence of highly transmissible and novel viruses and “shall be composed of experts selected by the Director-General” (WHO 2005a: 31). H1N1’s Emergency Committee, comprising 15 individuals, was established in April 2009 (WHO 2022b). The process by which the WHO’s Director-General and an Emergency Committee determine appropriate public health announcements remains unclear, however, with the only relevant further stipulation in IHR or broader WHO literature being that a pandemic declaration must include “an assessment of the risk to human health… and the risk of interference with international traffic” (WHO 2005a: 14).

The WHO’s internal decision-making processes regarding H1N1 therefore remain opaque. The only firm conclusion available is that H1N1’s declaration as ‘pandemic’ occurred on the basis of the discretionary authority vested in the WHO’s Director-General and H1N1’s Emergency Committee. Deliberating behind closed doors, it is unclear how decisions regarding H1N1’s classification occurred, or whose values counted in redefining ‘pandemic.’ The discretionary basis on which value-judgements regarding H1N1 were made, meanwhile, raises political concerns: if these were not decided in reference to the values of the public, then the WHO’s triggering of pandemic response plans in response to H1N1 seems potentially illegitimate.

1. **Democratised Science and its Dilemmas**

3.1. *Democratising H1N1: Two Approaches*

Calls to democratise science argue that non-epistemic value-judgements made during the production and communication of scientific claims ought to be included within the scope of democratic control. In a recent state-of-the-field paper, Kurtulmuş (2021: 146-7) identifies two key arguments that feature in such calls: (a) that “ensuring [publics] have a voice in the governance of science can help build trust between them and scientists,” and (b) that “if science provides crucial input for policy and if values play an ineliminable role in scientific inquiry, then scientists whose work is not informed by the values of the public can encroach the public’s… right to collective self-government.” The value-dependence of the WHO’s pandemic redefinition, being seemingly motivated by assessments of an appropriate global response to H1N1, makes the case a natural target for such arguments.[[5]](#footnote-5)

But, despite a wealth of argument aiming to *justify* the democratisation of science (see e.g. Jasanoff 2003; Wynne 2007; Douglas 2009; cf. Durant 2011), comparatively little attention has been paid to its *implementation*. Of that literature which does aim to provide practical guidance for implementing democratised science, the bulk has been devoted to developing accounts of *how* public values ought to be identified and deployed to resolve scientific value-judgements. Amongst these, two broad strands of practical proposal are identifiable, which I label as ‘majoritarian’ and ‘deliberative’ approaches to the democratisation of science.

As a general political theory, majoritarianism holds that democratic legitimacy belongs to the view most commonly held amongst a citizenry (cf. Emerson 2016). The most prominent proponent of the majoritarian approach is Schroeder (2021, 2022).[[6]](#footnote-6) Schroeder’s (2022: 12) claim is that, when scientists must make value-judgements, they have a duty to reference “the informed values and goals held by policymakers and the public. If it is not feasible to accommodate all views, preference should be given to the values and goals more commonly held.” Hence, as clarified elsewhere, “on the democratic values proposal, good science… will speak with a single voice and will offer a common reference point” (Schroeder 2021: 555), because all good scientific claims will be informed by majority public values. The democratisation of science thus construed requires no particular political decision-making structures. Rather, it requires that scientists are able to reliably *identify* the values of the majority public. On this basis, Schroeder (2021: 559) proposes that most scientific value-judgements can be democratised through straightforward evidential recourses: “on some issues… we already have a wealth of data about the public’s values. On other issues, I don’t think it would be especially challenging to piece together what the public values from existing data.” This apparent practicability lends some weight to Schroeder’s (2022: 12) suggestion that democratised science “can be jump-started using the existing literature in… political theory.”

A prominent alternative to majoritarianism is deliberative democracy, which reserves democratic legitimacy for views that are the product of appropriately-structured political debate, typically requiring consensus or near-consensus amongst participants (Johnstone 2011). The most notable contemporary proposal for a deliberative democratised science comes from Zeynep Pamuk (2022).[[7]](#footnote-7) As Pamuk (2022: 109-10) sees it, the major barrier for successful democratic deliberation in scientific contexts is the expertise-gap between scientists and publics: democratic deliberation requires equality of opportunity amongst participants to express and evaluate viewpoints, and “laypeople will not have the same level of knowledge as experts and will not be able to express their knowledge in expert vocabularies. When political issues with a significant scientific component are under consideration, laypeople will find it difficult to outwit experts.” Pamuk (2022: 112-123) therefore proposes to structure democratic deliberation about science by instituting ‘science courts’: a representatively-sampled citizen-jury will observe and interrogate an adversarial proceeding between experts advocating various means by which a scientific value-judgement could be resolved. Following, the citizen-jury will engage in a deliberative process and detail their preferred outcome, which constitutes the democratically legitimate view.

Despite general agreement that scientific value-judgements ought to be decided in reference to the values of the public, majoritarian and deliberative approaches to democratised science therefore return different normative assessments of the WHO’s redefinition of ‘pandemic,’ because they insist upon different methods for operationalising ‘public values.’[[8]](#footnote-8) The majoritarian approach allows that the WHO’s discretionary decision-making structure could return democratically legitimate outcomes: Schroeder’s framework tells us that, in assessing the correct response to H1N1, WHO officials ought to have considered majority public values. If they determined that the response most conducive to the fulfillment of public goals was a precautionary one, so that pandemic response plans ought to be triggered prior to the realisation of H1N1’s pathogenicity, then redefining ‘pandemic’ in order to permit this was normatively desirable.[[9]](#footnote-9)

The deliberative approach, meanwhile, denies that a discretionary decision-making structure can ever return democratically legitimate results, because democratic legitimacy resides in the outcomes of appropriately-structured political disputation. Instead, Pamuk’s framework tells us, judgements regarding H1N1’s classification ought to have been decided through the deliberation of a representative sample of affected laypeople, informed by adversarial proceedings between relevant experts. As described, the WHO has a ready-made deliberative decision-making structure in its WHA (2008: 130), whose decisions require “unanimous or… evident majority” consensus amongst representatives of the WHO’s 194 member states. As it stands, the WHA’s agenda exclusively regards policy responses *to* scientific claims, regarding e.g. appropriate responses *given* the declaration of a pandemic. But that the WHA is already ensconced in the WHO’s overall governance structure seems to provide Pamuk’s framework with a neat opportunity to provide feasible means of democratising the WHO’s treatment of H1N1.

The WHA met in May of 2009, one month prior to the WHO’s declaration of H1N1’s pandemic status. On the deliberative proposal, this declaration ought to have been preceded by a deliberative process from a representative citizen-jury, informed by adversarial proceedings between relevant experts. The WHO’s treatment of H1N1 might therefore have been democratised on Pamuk’s terms simply by including these processes in the WHA’s May 2009 agenda. The WHA, being constituted of representatives from each WHO member state, seems like a ready fit to serve in a citizen-jury capacity. Experts associated with the WHO – whether constitutive of H1N1’s Emergency Committee or otherwise – could in turn have provided the relevant adversarial proceedings regarding H1N1’s classification. The outcome of the WHA’s deliberation would then constitute the democratically legitimate view of how H1N1 ought to have been treated by the WHO.

3.2. *The Dilemma*

Wider literature on the role of values in science has aimed to demonstrate that scientific practices are shot through with a range of value-judgements at all stages of inquiry (see e.g. Douglas 2000; Winsberg 2012; Elliott 2017; Biddle & Kukla 2017). This ubiquity underpins a major practical concern facing the overall project of democratising science: that, as diagnosed by Schroeder (2021: 559), democratisation seems likely to overburden scientists with administrative duties. This is a crucial motivating factor for his proposal of a straightforward, discretionary model that might nonetheless suffice to meet democratic expectations: if it’s possible “to at least *approximate* a democratic values approach” (Schroeder 2021: 559, emphasis added) without necessitating direct public engagement from scientists, then the bureaucratic burden of democratisation could be minimised.

In the majoritarian case, however, a rough approximation of democratisation raises serious concerns regarding *equitability*. One classical challenge to majoritarian democratic theory is the ‘tyranny of the majority,’ wherein a majority voting bloc’s interests can substantially occlude minority interests from political representation (cf. Dahl 1989: 169-73). In aiming to alleviate the systematic disempowerment that the tyranny of the majority implies, majoritarian systems typically develop institutional means by which to ensure an appropriate degree of minority representation. One example is electoral units, which aim to ensure that less-populated regions maintain equal representation with more-populated ones. Such institutions are not uncontroversial, and typically require fine-grained attention to the demographic makeup of particular political settings in order to guarantee adequate minority representation; different political contexts can demand different elaborations on the basic majoritarian principle (see e.g. Lublin 1999; Bellamy & Kröger 2013). Lacking such context-specific refinements – allowing that a rough and discretionary majority-rules approach can suffice to meet democratic expectations – majoritarian systems can reasonably be expected to neglect minority perspectives. Meanwhile, given the special role that scientific testimony can play in political *disputation*, it seems plausible that including minority perspectives in scientific contexts is especially vital: failing to do so risks depriving minority political priorities of a crucial source of argumentative legitimacy (Hilligardt 2023; Thoma 2024). Hence, lacking substantial and context-specific elaborations, the majoritarian approach to democratised science seems liable to contravene basic democratic expectations of equity.

Although, of course, Pamuk’s proposal is inevitably more demanding than Schroeder’s discretionary model, the deliberative alternative might seem to have an advantage in this regard: deliberative democracy typically requires consensus or near-consensus, which can necessitate the development of compromise positions in cases of dissent and empower minority viewpoints (Johnstone 2011; Chambers 2003). But there are reasons for concern here as well. Specifically regarding the WHO, these regard the likelihood that pre-existing geopolitical factors, external to Pamuk’s deliberative process, would influence the outcomes of the WHA’s deliberations. The WHO has been construed as featuring a “democratic deficit” (Frenk & Moon 2013: 939) which arises out of the wider context of international relations within which its governance occurs: the WHA’s “ideal vision of [deliberative] democracy is tarnished by a contradiction between the nominal state-egalitarianism of multilateral organisations and the realities of power politics, where weaker states may be unwilling to defy their powerful neighbours, creditors or trade partners” (Pas & Schaik 2014: 196). These concerns are emblematic of a more general worry regarding deliberative democratic models: that, as Justin Pottle (forthcoming: 1) describes, deliberative proposals often rest “on an inflated sense of deliberation’s independence from the background conditions of speech. When citizens meet as deliberators, they arrive with common frames, concepts, and interpretations… that structure how they think and speak about politics.” When these background conditions include pre-existing and institutionalised hierarchical relations, the outcomes of deliberation are skewed towards replicating that status quo.

Theorists of deliberative democracy have worked extensively to develop processes sufficient to ensure that all participants’ contributions receive fair consideration and merit-based uptake, aiming to restrict the influence of bias, prejudice, and similar on deliberative outcomes (Young 2000; Fischer 2003; cf. Fricker 2007). Pamuk identifies another potential source of deliberative inequality – gaps in expertise – and a crucial contribution of her account is to provide processual means of controlling for this. But each of these solutions address only factors *internal* to deliberative processes, and therefore generalise away from the wider social, political, and institutional contexts within which those processes occur. As Pottle’s argument suggests in general terms, and as the relevance of pre-existing geopolitical factors to the WHA’s proceedings concretely demonstrates, attention only to internal processes is not enough to ensure the equality of opportunity that is central to the deliberative conception of democratic legitimacy. In the WHA’s case, the worry is that that a deliberative process which does not account for external power politics will simply return results reflective of the WHO’s most powerful member states’ interests. In general terms, lacking context-specific controls on the background conditions within which deliberation occurs, the deliberative approach to democratised science *also* faces an equitability worry.

The upshot is that, regardless of whether we take a majoritarian or deliberative approach to the democratisation of science, any plausibly equitable proposal of such will probably need to be tailored to particular political *settings*: no context-independent set of decision-making procedures seems likely to prove equitable across the wide range of political landscapes within which science proves socially consequential (cf. Wagner 2022). In turn, on the terms so far developed, the worry emerges that it might not be *possible* to simultaneously secure democratic legitimacy for science, and avoid incurring extraordinary opportunity costs for scientists. Successful democratisation might necessitate that scientists engage in detail with an enormous range of context-specific political decision-making procedures. Given the ubiquity of value-judgements throughout inquiry, the administrative duties that this requirement would incur are hard to overstate.

The remainder of this paper is given over to articulating a partial solution to this dilemma: that securing democratic legitimacy for scientific results seems liable to incur drastic opportunity costs for scientists. What I propose is that proponents of democratised science might have moved too quickly in focussing attention on the question of *how* public values ought to be identified and deployed in resolving scientific value-judgements; and that the plausibility of democratisation might be substantially improved through careful attention to the more fundamental question of *whose* values ought to determine *which* value-judgements. By differentiating the varieties of epistemic risk at play in the WHO’s treatment of H1N1, I propose a principled basis on which to think that democratisation need only be partial. This provides a pathway to mitigating the opportunity costs innate to the democratisation of science – notby minimising the difficulty of achieving equitable democratic representation, but by minimising the scope of scientific value-judgements that demand democratisation in the first place.

1. **Ontic and Inductive Risks: A Legal Analogy**

4.1. *Inductive Risk and the Juror’s Task*

It’s worthwhile first to introduce some of the major tools through which philosophers have engaged with the role of values in expert reasoning: ‘epistemic risk,’ and ‘inductive risk.’ Broadly, as developed by Justin Biddle & Quill Kukla (2017: 215), epistemic risks occur “at each stage of inquiry [when] our actions, choices, and judgements carry with them a chance that they will lead us towards mistakes.” When choices must be made during scientific inquiry that are not determined by logic or evidence, scientists face epistemic risk. In turn, when those choices imply potential non-epistemic consequences, determining the appropriate course of action in epistemically-risky contexts necessitates recourse to values.

Inductive risk is a particular variety of epistemic risk, and by far the most significant contemporary basis through which the role of values in science has been addressed. Driven by Heather Douglas (2000: 563), the argument from inductive risk reorients the significance of the inductive gap to address “the important role scientists play in practical decision-making,” and the effects of scientific claims “beyond the development of a body of knowledge.” On this basis, Douglas (2008: 10) articulates a legitimate, ‘indirect’ role for values in the production and communication of scientific claims, which occurs when determining “the strength of evidence we should require for a particular claim.” In other words, scientists ought to evaluate the contextual consequences of error in order to establish how much inductive uncertainty is permissible when making an empirical assertion. This in contrast to the impermissible ‘direct’ role, wherein values are “taken as reasons in themselves to accept or reject an empirical claim” (Douglas 2008: 8).

The argument from inductive risk provides a neat reading of how the WHO’s classification of H1N1 might have occurred. H1N1 was of unknown pathogenicity but was known to be novel and highly transmissible. The WHO (2005b), having recently assessed the catastrophic potential of a novel, highly transmissible, *and* highly pathogenic influenza pandemic following several outbreaks of avian influenza,[[10]](#footnote-10) was therefore confronted with epistemic uncertainty under circumstances in which an under-precautionary approach risked a global health catastrophe. A precautionary approach, meanwhile, posed chiefly economic risks. Since the situation was epistemically underdetermined, the WHO’s decision to classify H1N1 as pandemic was feasibly justifiable on the basis of their evaluation of these respective consequences of error, despite uncertainty regarding its pathogenicity. This gloss fits neatly with calls to democratise science, in that it was during these inductive risk assessments that democratic procedures (of whichever variety) ought to have determined the WHO’s decision-making.

But the WHO’s classification of H1N1 required an update to the definition of ‘pandemic.’ Accepting that reasonable assessments of inductive risk could serve as the sole warrant for H1N1’s classification implicitly condones the *redefinition of a classificatory standard* as a legitimate part of the *process of local classification*. This is not, at least self-evidently, epistemologically problematic (cf. Chang 2016). But it entails some troubling implications when assessing proper roles for non-epistemic values in science.

A legal analogy regarding judicial processes, developed by Marion Vorms and Ulrike Hahn (2021), assists in articulating as much. Vorms and Hahn (2021: S3614) take the “juror’s task as offering a simplified image of consequential decision-making under uncertainty,” drawing parallels between judicial processes and scientific assessments such as those regarding “the potential hazards of greenhouse gases.” The juror’s task is, on this view, an instance of inductive risk assessment, since it requires an assessment of the appropriate confirmation threshold for a hypothesis, in reference to both the consequences of error and the risks and potential benefits of delaying the decision (Vorms & Hahn 2021: S3630).

What’s the relevance of the juror’s task to the classification of H1N1? It seems perfectly reasonable that jurors weigh the local consequential risks of declaring guilt or innocence: respectively, convicting the innocent, or acquitting the guilty. But if their conclusion is that a declaration of guilt would be preferable, and even if this is entirely reasonable *in that local context*, the empirical facts of the case must fit the generalised criteria by which il/legality is determined – i.e., the law. The truth-value of a guilty verdict relies on this congruence. It would be clearly unacceptable if, having decided that the best local outcome is a guilty verdict, jurors were able to modify the law in order to ensure that verdict’s veracity. This would be to upset the generalised definition of il/legality as a part of the process for determining localised guilt. A parallel can be drawn between this legal scenario, and the redefinition of ‘pandemic’ in order to allow H1N1’s classification as such. To understand the worry, another form of epistemic risk must be recognised: ‘ontic risk.’

4.2. *Ontic Risk and the Law*

That the WHO’s 2003 and 2009 pandemic standards connote different social risks is evident. The 2003 standard demands the satisfaction of more empirical conditions and could therefore limit the timeliness of international pandemic responses. The 2009 standard is less exclusive, thereby providing greater scope for international overreaction. But the problem of induction is irrelevant to such classificatory risks. So, assessing the relative benefits of *general* pandemic standards cannot be captured by inductive risk approaches. The type of choice posed when deciding between the WHO’s 2003 or 2009 pandemic definitions is what David Ludwig (2016) calls an ‘ontological choice.’

Ontological choices are choices between classificatory standards that negotiate “the truth-values of scientific statements… often depend[ing] on non-epistemic values” (Ludwig 2016: 1268). Empirical claim ‘H1N1 was pandemic in 2009’ is true by the WHO’s 2009 definition but false by their 2003 definition. Moreover, a choice between the two is clearly not epistemically determined – neither option produces more ‘correct’ empirical claims in any value-independent sense. The WHO’s preference for the 2009 standard was instead determined by a pandemic declaration’s status as a *consequential action*, eliciting specific political responses on the basis of a judgement regarding what sorts of things ‘pandemic’ ought to refer to. As later stated, the WHO’s (2011: 5) intent in declaring H1N1 pandemic was to “help national authorities… to stop/slow down… [H1N1’s] progression.”

The sorts of risks posed by divergent pandemic standards are *ontic risks*: risks regarding what we take to exist and how we determine membership to socially consequential scientific categories. Ontic risk is an as-yet unarticulated concept in published literature regarding values in science,[[11]](#footnote-11) but is implicit in Biddle’s (2016) concerns regarding disease overdiagnosis. Biddle’s (2016: 199) issue is that “expansions of disease definitions” occur “out of an interest in benefiting [individual] patients.” The argument is that this leads to overdiagnosis, but that inductive risk is unable to account for the risks posed by particular classificatory choices. Biddle (2016: 196, 202) illustrates the case’s distinction from inductive risk simply by characterising it as an example of non-inductive epistemic risk. But his specific concern regarding disease classification standards regards an instance of ontic risk assessment, and I suggest that we consider ontic and inductive risks to be distinct types of the broader epistemic risk.[[12]](#footnote-12)

Assessments of ontic risk, and ontological choices made thereby, thus determine the truth-values of scientific claims such as pandemic declarations much as the law determines the truth-value of a trial verdict. Moreover, just as a pandemic declaration makes an empirical claim and produces political consequences, “a trial verdict… is at the same time an assertion… and a consequential action” (Vorms & Hahn 2021: S3614-5). Vorms and Hahn’s analogy can thus be extended to address ontic risk. If the juror’s task is the local assessment of inductive risk, we can in turn characterise potential updates to the law as requiring an assessment of ontic risk: what are the risks and benefits of defining il/legality in various ways? If, for instance, we make the legal definition of ‘slander’ more inclusive, we may more reliably protect individuals from defamation, but restrict the capacity for free speech. Again, this is a very different type of risk than that posed to the juror in a local case of potential slander, where the question is how much evidence is enough to determine whether the local case fits the general definition.[[13]](#footnote-13)

4.3. *Different Normative Solutions for Different Epistemic Risks*

There is something obviously distinct about how we want the law to be updateable versus how we want it to be applicable. As Melissa Schwartzberg (2007) has discussed at length, there is a fundamental tension in democratic theory between changeable laws as maintaining legitimate citizenry representation, and entrenched laws as ensuring democratic rights. But there remain some basic observations we can make regarding the advantages of legal stability, and conditions for legal changeability. Legal stability invests judicial processes with a *prima facie* claim towards “equality and neutrality,” since otherwise officials would “be allowed to criminalise and punish at random… bringing in their own value-judgements with regard to punishability” (Claes & Krolikowski 2009: 93). For citizens, stability also has the benefit of providing the regularity necessary to avoid criminality. When laws are updated, this is the purview of legislators, as nominal citizen representatives. This is so that (a) citizen values are represented in law, (b) due process is observed, and (c) the separation of powers is maintained, “a foundational tenet of liberal democracy” (Carolan 2009: 1). The stability of generalised legal standards for determining il/legality, applied equally throughout the set of local judicial processes, allows those processes to claim impartiality when providing trial verdicts. Updates to those standards, meanwhile, occur in legislatures on the basis of public values, from which the law is generally taken to derive its legitimacy. Being democratically derived, an update to law occurs (or at least normatively ought to occur) in a transparent and inclusive fashion, mitigating the potential social costs of upset legal stability.

Although, clearly, we want our epistemic standards to be reflexively updateable, they also benefit from stability. As Torsten Wilholt (2013: 245) has argued, communal trust in scientific enterprises relies “upon wide-spread observance of the rules,” in a sense regarding consistency, so that “epistemic reliance should… correspond to an actual standard of reliability for communicated scientific results” (Wilholt 2013: 236). Moreover, the effective deployment of scientifically-informed policy partially relies on consistent standards – if pandemic-preparedness policy is developed under one pandemic definition, a definitional update might upset the intent of that policy by altering its referent. This could, for instance, undermine the deliberative proceedings of the WHA, given their role in developing policy responses on the basis of the WHO’s scientific claims. Such a misalignment, between the intended referent of pandemic response plans and the updated definition of ‘pandemic’ under which the WHO classified H1N1, is exactly what the Council of Europe (2010) identified in its condemnation of the WHO’s response to the virus. The nominal impartiality of science advice as a factual arbiter in local contexts therefore relies on the relative stability of general epistemic standards, demonstrating the particular care that ought to be taken with updates to classificatory standards in socially consequential scientific contexts.

A plausible normative account of the relationship between law and judicial processes may be proposed as follows. The law, as the general and relatively stable standard by which local cases of il/legality can be determined, is democratically produced in reference to citizens’ values. The execution of the law, that is, judicial processes, does not need to be democratically conducted – and need not reflect the values of the majority public – since these processes consist of inductive risk assessments regarding acceptable degrees of uncertainty in the making of empirical assertions, the truth-values and entailed consequences of which are already to that extent determined *by* the law. Sufficient democratisation has occurred in setting the general standards by which local cases of potential illegality can be classified.

So, at least in legal settings, it seems uncontroversial that the value-judgements necessary to resolve instances of ontic versus inductive risk assessment do not require equivalent normative treatments. This on the particular basis that decision-making structures for the assessment of inductive risk can derive normative justification from the means by which ontic risk assessment has occurred: judicial processes can claim democratic legitimacy on the specific basis that legislative processes have occurred in an appropriately democratic fashion.[[14]](#footnote-14) On the same basis, this arrangement allows a special role for experts – judges – in the determination of trial verdicts, without obviously upsetting the democratic legitimacy of those verdicts (cf. Scheppele 2005).

If we accept that both scientific and legal contexts must negotiate both ontic and inductive risk, then all this invites the question: might the normatively desirable means by which scientific value-judgements are decided in ontic versus inductive risk assessment be similarly distinct from one another? Arguments for democratised science are grounded in the basic democratic principle that the public has a right to collective self-government. But, at least in legislative and judicial settings, inductive risk assessments are regularly conducted through undemocratic decision-making procedures without seeming to contravene democratic expectations. It is therefore not self-evident that democratic principles require that instances of *scientific* ontic and inductive risk assessment be conducted by the same people using the same political procedures. Different kinds of epistemic risk may demand the opposite: to be managed by different groups of people using different political procedures. On this basis it does not seem obviously implausible that, for instance, were decisions regarding the definition of ‘pandemic’ conducted in a substantively democratic fashion, then decisions regarding how much evidence is required to locally *declare* a pandemic thus defined could permissibly occur on a less-inclusive basis. Even if it is maintained that scientific ontic and inductive risk assessments do demand the same normative treatments, this is not a clearcut justified default, and would need to be argued for. Thus, at least, ontic and inductive risk require independent normative assessments.

4.4. *What’s Wrong with Ignoring Ontic Risk?*

The above suggests some immediate practical concerns that arise out of permitting inductive risk assessments to subsume ontic risk assessments, or in this case, with permitting the WHO’s local assessment of H1N1 to decide the general definition of ‘pandemic.’ Permitting as much provides no mechanism to (a) guarantee the relative stability of epistemic standards, or (b) ensure that updates to standards occur in a transparent manner sufficient to mitigate the social consequences of an upset to stability. The social consequences of the WHO’s behind-closed-doors redefinition of ‘pandemic’ can be identified in the significant criticism and loss of public trust that followed its 2009 decision (COE 2010; Mandeville et al 2013; Kamradt-Scott 2018). Doubts expressed regarding the motives behind the WHO’s declaration of H1N1 as ‘pandemic’ still feature in conspiracy-theorist rhetoric regarding COVID-19 (cf. Hakim 2021).

But there is a larger problem with permitting local inductive risk assessments to determine general classificatory standards. Recall Douglas’s (2008) account of ‘direct’ and ‘indirect’ roles for values. In the impermissible direct role, values are “taken as reasons in themselves to accept or reject an empirical claim,” while in the permissible, indirect role values “weigh the importance of uncertainty by considering the consequences of error” (Douglas 2008: 8). The realisation of ontic and other epistemic risks indicates that Douglas’s account is probably insufficiently complex to encompass the full range of potentially il/legitimate roles that values might play in research (Elliott 2011; cf. Holman & Wilholt 2022). But the essential point remains obviously reasonable: value-judgements cannot serve as direct warrant for the acceptance of empirical claims.

Given that ontic and inductive risks are distinct, we may now characterise what occurred during the WHO’s classification of H1N1 as follows. Regarding inductive risk, values seem to have contributed unproblematically in Douglas’s indirect sense – given epistemic uncertainty regarding H1N1’s threat, the WHO’s decision-making authorities determined that a potential global overreaction was preferable to a potential underreaction, so that the appropriate response to H1N1 was to recommend the enactment of pandemic response plans. But this assessment of inductive risk assessment was then permitted to serve as direct warrant for redefining the general classificatory standard ‘pandemic,’ which *ipso facto* determined the truth-value of the relevant empirical claim: that H1N1 was pandemic in 2009. Hence, by allowing inductive risk assessment to subsume ontic risk assessment, the potential arises that we allow values functioning in Douglas’s impermissible directrole in through the back door. Value-judgements regarding an appropriate *response to* H1N1 can serve as reasons in themselves for accepting empirical claims *about* H1N1.

A misrepresentation of arguments for democratised science is that they allow “voting on the truth or falsity of scientific hypothesis” (Kurtulmuş 2021: 145). Actual proposals instead aim to carefully restrict the purview of democratic processes to instances wherein epistemic considerations cannot recommend decisive conclusions. But if inductive risk is permitted to subsume ontic risk, and the assessment thereof given over to democratic decision-making structures, then the preceding indicates that this mischaracterisation could become a genuine worry. Democratic value-judgements regarding how we ought to respond tosome phenomenon under uncertain conditions could serve to determine the truth or falsity of empirical claims aboutthat phenomenon. This would be to permit value-judgements to supplant epistemic priorities, in clearcut contravention of basic epistemic norms.

The realisation of ontic risk as independent of inductive risk therefore poses two distinct complexities for determining the proper role of values in science. The first is that failing to distinguish ontic from inductive risk opens the door for value-judgements to directly warrant scientific acceptance. More interesting for my purposes here is the second: that it seems reasonable to insist that different varieties of epistemic risk demand independent normative assessments, and therefore, that it is not implausible to suppose that we might want different answers to the ‘whose values?’ question when addressing different varieties of epistemic risk. The next section aims to capitalise on this possibility in order to resolve some of the plausibility concerns for democratised science raised in section 3.

1. **Centring Ontic Risk**

5.1. *Ontic Risk and the ‘Whose Values?’ Problem*

It's commonly assumed throughout the literature on values in science that, in order for scientific value-judgements to be democratically legitimate, they must be made in direct reference to public values.[[15]](#footnote-15) On this basis, it seems likely that most proponents of democratised science would accept the differentiation of ontic and inductive risks, but insist that – given the desideratum of scientific democratic legitimacy – we ought to answer the ‘whose values?’ question with public values in both cases. At least in legal settings, however, it’s clear we can have compelling independent reasons to prefer that inductive risk assessments occur on a less-inclusive basis than ontic risk assessments. And, as the problem of opportunity cost described in section 3.2. suggests, similar reasons can apply in scientific contexts as well.

Consider again the juror’s task, this time in a high-profile case of slander. Assume that the majority public’s opinion is that the defendant is guilty. Such high-profile cases have generated anxiety amongst legal scholars: as one puts it, “public suspicions and pretrial deliberation about a defendant’s guilt have become commonplace, contaminating jury pools to a greater extent than ever before and jeopardising defendants’… right to a fair trial” (Tanoos 2017: 997). The ‘contaminating’ factor in such cases *is* public opinion, because the principles which govern judicial proceedings demand that jurors have no prior disposition towards returning a guilty verdict. In other words, majority public opinion ought not to matter to the juror: what matters is whether the empirical facts of the case fit the general criteria by which ‘slander’ has been defined under the law. The juror’s task in this case will still inevitably require value-judgements, insofar as establishing the appropriate confirmation threshold for a guilty verdict will necessitate inductive risk assessment. But were these value-judgements decided through a democratic process, we would be forced to conclude that the resulting guilty verdict was ultimately illegitimate. We have, in this case, decisive reasons of justice to ensure that the juror’s inductive risk assessments are conducted *without* reference to public values. Democratic input into the trial verdict must be restricted to the legislative proceedings that define the general criteria of ‘slander.’

So, it cannot be that *every* socially consequential inductive risk assessment ought ideally to be conducted in reference to public values. In some cases, it seems clear that ontic risk assessment (what are the risks/benefits of defining il/legality in various ways?) demand democratic input, but that inductive risk assessments made on that basis (how much evidence is enough to declare guilt in this instance?) demand insulation from public values. Still, the applicability of this case to WHO’s treatment of H1N1 isn’t perfect, because it isn’t likely that scientific processes of inductive risk assessment will regularly demand insulation from public values for reasons of *justice.*[[16]](#footnote-16)

Consider another case, then, from political theorist Bernado Zacka (2017: 53-6) regarding USA legal guidelines for determining which individuals qualify for disability welfare programs. In these guidelines, the term ‘disability’ is defined in deliberately minimal terms – it demands the satisfaction of relatively few empirical criteria. This, in turn, facilitates significant discretion amongst adjudicators when determining which individuals ought to qualify for the relevant programs, i.e., when making inductive risk assessments in reference to the relevant classificatory standard. As Zacka (2017: 54) puts it, it gives “adjudicators the leeway to handle a range of cases… that would otherwise have fallen through the cracks. Discretion here is desirable insofar as it allows frontline officials to do justice to the particularities of cases that would otherwise be arbitrarily distinguished by hard boundaries.” In this case, the relevant ontic risk assessment (what are the risks/benefits of defining disability in more/less stringent terms?) has deliberately facilitated frontline officials to make value-judgements without reference to public values. While this facilitation is desirable in that it allows these officials to ‘do justice’ to candidates for disability welfare, the relevant inductive risk assessments do not demandinsulation from public values *on grounds of* justice as in the judicial case. Rather, leaving out public values is desirable on straightforward pragmaticgrounds – the process of officiating disability welfare programs in constant consultation of public values would be impossibly demanding, to the detriment of effective social policy action.

Given the opportunity cost worry faced by calls to democratise science, it seems clear that similar pragmatic considerations apply in scientific contexts too. One motive for arguing that *scientific* inductive risk assessments ought to occur on a less-inclusive basis than ontic risk assessments is simply that instituting democratisation on that basis would be less demanding for scientists. Regarding the WHO and H1N1, this would halve the administrative burden that democratisation places on scientists: rather than demanding that *both* value-judgements regarding the proper extension of ‘pandemic’ *and* value-judgements regarding H1N1’s potential threat be subject to democratic decision-making processes, only the former would require political engagement from WHO officials.[[17]](#footnote-17) This priority is especially pressing given the equitability concerns raised by Schroeder’s (2021: 559) strategy for ameliorating the problem of opportunity cost, i.e., his proposal of a democratic decision-making process that requires no bureaucratic apparatus. If the WHO *were* to be substantively democratised, achieving equitable representation therein would likely require an elaborated political decision-making structure that seems certain to prove burdensome for the scientists involved. Hence, if we’re to salvage the plausibility of democratisation, we need an alternative pathway towards a democratised science that makes fewer demands of scientists. The prioritisation of ontic risk assessment is one such pathway. [[18]](#footnote-18)

While this is not a refutation of the position that all scientific value-judgements ought to be decided in reference to public values, what it highlights is that maintaining as much constitutes a *trade-off*: between maximally expanding the scope of democratic control over scientific decision-making, and minimising the administrative burdens of scientists.

5.2. *Ontic Risk, Inductive Risk, and Democratic Control*

At the most general, as Kurtulmuş (2021: 142) summarises, “the democratisation of science is the widening of the scope of democratic control to include various decisions about science.” As such, democratisation is not an all or nothing consideration – democratisation can be partial, in that we can include *some* scientific value-judgements within the scope of democratic control without including others. The overall project of democratised science is aimed at extending democratic control to as many scientific value-judgements as feasibly possible.

Despite the centrality of democratic control to the democratisation of science, proponents operate with a surprisingly restrictive sense of how democratic control can be exerted. As noted above, it is generally accepted that scientific value-judgements can onlybe democratically legitimate if they are decided in direct reference to public values. This account is, to say the least, counterintuitive, as becomes particularly obvious when it’s applied to socially consequential non-scientific value-judgements: if the *only* democratically legitimate value-judgements are those decided in reference to public values, we’re forced to conclude that trial verdicts are regularly and routinely democratically illegitimate.

The perspective in question has recently come under serious scrutiny from Hannah Hilligardt (2024), who argues that undemocratic value-judgements made in fulfilling the democratically legitimate aim of a public *institution* maintain democratic legitimacy. As applied to judicial processes,[[19]](#footnote-19) Hilligardt’s (2024: 16-9) account tells us that since fair and unbiased trial verdicts are necessary for the proper functioning of a democratic system, the rules and norms that govern judicial processes are democratically legitimate when they support that functioning. Hence, since fair and unbiased trial requires the exclusion of public opinion, the discretionary value-judgements of jurors are able to determine a trial verdict while maintaining democratic legitimacy. Hilligardt (2024: 6) proposes that we can extend this account of institutional legitimacy to scientific value-judgements, too: “normative judgements need not be democratically legitimated in order for science to be legitimate. Indeed, it can be democratically legitimate for scientists to go against the expressed views of the public… if this is justified in light of… the role science has been asked to fulfill and… in line with public institutions’ key principles.”

Hilligardt’s arguments are persuasive, but in the case of judicial proceedings the institutional perspective misses something important: the outcome of a trial verdict is, as a matter of fact, substantively within the scope of democratic control. More specifically, the legal definition of terms like ‘slander’ place well-defined limits on the discretionary decision-making authority vested in jurors. A juror cannot, on the basis of their value-judgements, declare guilt when the empirical facts of the case do not meet the criteria set out by the law, because the truth-value of a guilty verdict is determined *by* those criteria. Since, unlike judicial proceedings, legislative proceedings occur through democratic processes, this provides publics with the opportunity to exert democratic control over the outcomes of trial verdicts despite the necessity of excluding public values from jurors’ processes of inductive risk assessment therein.

Zacka’s (2017: 53-6) case, regarding the legal definition of ‘disability,’ is particularly interesting in this regard, because the discretionary authority granted to frontline officials to evaluate candidacy for disability status is an intended functionof the relevant legislation. In other words, this is a case in which democratic legislative processes of ontic risk assessment regarding the appropriate extension of ‘disability’ have resulted in a consciously under-refined set of empirical criteria, with the deliberate intent of facilitating increased discretionary powers for those intended to conduct inductive risk assessments on the basis of those criteria.

The upshot is that the democratisation of ontic risk assessments can *ipso facto* bring inductive risk assessments within the scope of democratic control, by defining both (a) the extension of socially consequential categories, and so the truth-values of empirical claims made in reference to those categories, and (b) the extent of discretionary leeway that the empirical criteria associated with socially consequential categories permit when local processes of inductive risk assessment occur in reference to those categories. This is, of course, a more modest form of democratic control than would be accomplished by requiring that all inductive risk assessments be conducted on a directly democratic basis. But it raises the question: how *much* democratic control is sufficient to ameliorate the political concerns raised by the influence of non-epistemic values in science? In the case of the WHO’s treatment of H1N1, it sems plausible that the democratisation of ontic risk assessments – and *only* ontic risk assessments – would prove sufficient for such purposes.

The central political concern that the case raises is that, by declaring H1N1 ‘pandemic,’ the WHO was able to initiate pandemic response plans with complete discretion. This was facilitated by the WHO’s redefinition of ‘pandemic,’ and the removal of criteria relevant to pathogenicity therein. Under the 2003 definition, H1N1 *could not* have been classified as a pandemic – it lacked the requisite empirical characteristics. Under the 2009 definition, the WHO enjoyed discretionary powers sufficient to assign a novel virus pandemic status without evidence of its pathogenicity. Hence, had value-judgements regarding ontic risk (what are the relative risks of defining ‘pandemic’ in a more- or less-inclusive way?) been decided in reference to public values, the outcome of this democratic process would serve to impose well-defined boundaries on the discretionary authority that the WHO was able to exercise in its assessment of H1N1’s threat. *No matter whose values* contributed to inductive risk assessments regarding H1N1, the outcome of the relevant ontic risk assessment determined whether it could or could not be classified as ‘pandemic,’ and hence whether pandemic response plans could be initiated in response to its emergence. The democratisation of inductive risk assessments was therefore straightforwardly unnecessary for the enaction of pandemic response plans in reaction to H1N1 to have been included within the scope of democratic control.[[20]](#footnote-20)

What this indicates is that the trade-off implicit in insisting that all scientific value-judgements ought to be decided in reference to democratic values – between maximally expanding the scope of democratic control over scientific decision-making, and minimising the administrative burdens of scientists – does not always pay dividends. At least in the case of the WHO and H1N1, insisting that inductive risk assessments be independently democratised not only doubles the democratic duties of scientists, but fails to meaningfully expand the scope of democratic control. If the overall project of democratised science is aimed at extending democratic control to as many scientific value-judgements as feasibly possible, then it seems plausible on this basis that ontic risk ought to be a central point of focus for its proponents. The democratisation of ontic, but *not* inductive, risk assessments can provide sufficient means by which to ameliorate the political concerns raised by the influence of non-epistemic values in science, while proving significantly less demanding than an alternative approach that demands *all* scientific value-judgements be decided democratically.

5.3. *Generalising the Strategy*

As I’ve construed it, the feasibility concern regarding opportunity cost for the overall project of democratised science emerges out of the relation of two factors: (a) that determining public values in a manner conducive with democratic expectations is difficult, and (b) that value-judgements are ubiquitous throughout inquiry. The problem arises because, if scientific value-judgements must be made democratically, and yet doing so in a way that meets democratic expectations is a difficult and involved process, then the ubiquity of value-judgements throughout inquiry means that scientists will be embroiled in administrative duties and left unable to conduct effective research.

Schroeder’s strategy for ameliorating the opportunity cost concern is to circumvent (a): he proposes a simple means by which scientists might meet democratic expectations while making their value-judgements, that requires no or very little additional administrative burden. Pamuk does not prevaricate in assigning scientists administrative duties, but by proposing a singular context-independent process for democratically resolving scientific value-judgements, her account underestimates the extent to which (a) threatens the feasibility of democratised science. As suggested in section 3.2. above, it seems plausible that this general strategy alone is likely to fail: meeting the basic democratic expectation of equity *is* difficult, and accomplishing as much is likely to necessitate far more elaborate political decision-making structures than either author provides.[[21]](#footnote-21)

Instead, the approach to democratisation that I’ve aimed to develop here is emblematic of an alternative strategy for ameliorating the problem of opportunity cost: by circumventing the relevance of (b). In the case of the WHO on H1N1, I’ve argued that the democratisation of ontic risk assessment could have mitigated concerns regarding the democratic legitimacy of the WHO’s pandemic declaration, without requiring that subsequent inductive risk assessments be subject to democratic decision-making processes. This minimises the opportunity costs that democratisation would incur, *not* by minimising the complexity of making value-judgements on a democratic basis, but by minimising the set of scientific value-judgements that demand democratisation in the first place. In other words, the opportunity cost concern is not so threatening as it appears, because the democratisation of science need only be partial.

Whether or not this strategy proves successful in a wider set of contexts, or in regard to other interrelated varieties of epistemic risk, are questions that I can’t answer here. But there is, I think, a general lesson to draw. As noted, literature on the democratisation of science has tended to assume that the answer to the ‘whose values?’ question is self-evident given the desideratum of scientific democratic legitimacy: scientific value-judgements must be made in reference to public values. While this stance has been criticised before, especially by Hilligardt, what the argument presented here establishes is that this attitude is not only unnecessary, but can be profoundly *unhelpful*: it risks magnifying the practical challenges inherent to the project of democratising science, without offering an improvement to democratic control over science in return. Assuming that all scientific value-judgements ought ideally to be decided in reference to public values can therefore inhibit the practicability of calls to democratise science without advancing the ideals that underpin those calls. Accepting that democratisation need only be partial can prove not only pragmatically helpful, but politically warranted.

Instead, answers to the ‘whose values?’ question ought to be made in careful consideration of the diverse and interrelated normative stakes that different epistemic risks connote. The role that ontic risk assessments can play in defining the space of discretion within which subsequent inductive risk assessments can be made is a concrete demonstration of the dividends that such considerations can pay: when different varieties of epistemic risk are interdependent, it affords us opportunities to engage in greater detail with the mechanisms through which democratic control can be extended to scientific value-judgements, over and above the direct institution of political decision-making structures. Differentiating varieties of epistemic risk, and subjecting them to independent normative assessment, seems likely therefore to prove crucial to the overall practicability of democratising science, especially because it can provide principled grounds on which to differentiate those scientific value-judgements that *do* demand democratisation from those that *don’t*. The arguments presented here constitute a step in this direction.

1. **Concluding Remarks**

One way of reconstructing the arguments presented here is to observe that sections 3 and 4 raised two distinct complications for the general project of democratising science. The first is that, lacking substantial and context-specific elaborations, both the majoritarian and deliberative approaches to the democratisation of science would likely fail to meet democratic expectations of equity. This left us without a clear account of *how* we might place scientific value-judgements within the scope of democratic control. The second is that different types of epistemic risk – ontic and inductive – plausibly require separate normative treatments, and that failing to differentiate the two raises both political and epistemic concerns. This left us without a clear account of *which* scientific value-judgements ought to be decided through democratic processes.

The arguments presented in section 5, meanwhile, solve half of the first problem through due attention to the second. At least as it relates to the WHO’s treatment of H1N1, value-judgements regarding ontic *but not* inductive risk ought to be decided through democratic processes. This on pragmatic grounds, regarding administrative burdens for scientists, and moreover on political grounds, because the democratisation of ontic risk assessments can *ipso facto* extend the scope of democratic control to relevant inductive risk assessments. I say that this solves half of the first problem because it shows us one way that value-judgements regarding *inductive* risks can be included within the scope of democratic control: via the democratisation of ontic risk assessments.

In turn, this result recommends a novel means of ameliorating a central worry for the general plausibility of democratising science: that, given value-judgements are ubiquitous throughout inquiry, and meeting democratic expectations is a difficult process, democratisation would obstruct effective research by incurring drastic opportunity costs for scientists. Previous attempts at circumventing this concern, particularly from Schroeder (2021, 2022), have aimed to demonstrate that meeting democratic expectations can be relatively straightforward. In contrast, I’ve aimed to demonstrate that the problem might be effectively addressed through substantiating the notion of *partial* democratisation, and providing principled grounds for restricting the scope of scientific value-judgements that call for public input in the first place.

Of course, even if we’re able to minimise the number of scientific value-judgements that demand direct public input, the question of *how* public values ought to be identified and deployed to resolve those judgements that *do* demand democratisation remains a significant one. Although generic proposals such as Schroeder’s and Pamuk’s have an important role to play in this regard, this role is plausibly limited to serving as benchmarks through which to identify finer-grained details relevant to democratisation in particular contexts. Ultimately, if science is to be democratised, it seems likely that decision-making structures will need to be tailored to particular political settings. This poses a forbidding practical challenge in its own right – at least for philosophers interested in furthering the overall plausibility of democratising science. But it further highlights the central message that I’ve aimed to convey here. Before we proceed with the difficult work of determining how public values ought to be identified and deployed to resolve scientific value-judgements, it’s crucial that we gain a clear understanding of *whose* values ought to be determining *which* value-judgements. Lacking as much, the prospects for a plausibly actionable democratised science look bleak.

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1. Another prominent example of a deliberative approach is Philip Kitcher’s (2001, 2011) ‘well-ordered science,’ which associates democratic legitimacy with the outcomes deliberative processes *would produce* under ideal conditions. But the capacity of this hypothetical process to provide practical action-guidance has been subject to serious scrutiny elsewhere (Larroulet Philippi 2020), and I do not discuss well-ordered science further here. [↑](#footnote-ref-1)
2. Used here as shorthand for A(H1N1)pmd09, popularly known as ‘swine flu.’ [↑](#footnote-ref-2)
3. The choice of the term ‘description-definition’ reflects a controversy that emerged in the political aftermath of H1N1, when the Council of Europe (2010) accused WHO of redefining ‘pandemic’ so that H1N1 could be thus classified. The WHO (in Lowes 2010) responded that they had updated the “description” but not the “definition” of pandemic influenza. The remainder of this section says a little more on this controversy. [↑](#footnote-ref-3)
4. It seems overall unimportant to me whether we prefer to call the update to pandemic classificatory standards a ‘redefinition’ or ‘redescription.’ If the WHO’s characterisation is preferred, my references to redefinition in the following can be substituted for redescription. [↑](#footnote-ref-4)
5. It might be argued that, since WHO officials serve partially bureaucratic roles, the norms that ought to govern their practices are distinct from those relevant to more traditional scientists. I am not inclined to take this worry particularly seriously: as Corey Dethier (2022: 16) observes regarding norms for scientific assertion, “scientists… are almost always performing many different roles at once… that place different obligations and responsibilities on them. The messy hybrid case is the normal one, meaning it’s not usually appropriate to say that a particular assertion should be judged as [e.g.] an advocacy-role assertion.” WHO officials are one such messy hybrid case, and for current purposes it seems reasonable to assume that general scientific norms apply here. [↑](#footnote-ref-5)
6. Plausibly, another example of a majoritarian democratised science is Kristen Intemann’s (2015) ‘aims’ approach. While this account is vague regarding its conception of democratic legitimacy (cf. Lusk 2021), Intemann (2015: 227) associates “democratic endorsement” with “widely held interest[s],” and is therefore reasonably understood as appealing to the values most widely held within a population. Intemann’s proposal is distinct from Schroeder’s, particularly in its emphasis on stakeholder engagement as a means of identifying public values. In the context discussed, however, many of the challenges it faces are the same, and I here emphasise Schroeder’s account. [↑](#footnote-ref-6)
7. Another proposal for a deliberative democratised science comes from Greg Lusk (2021). There are some subtle theoretical differences between Lusk and Pamuk, most notably that Lusk (2021: 108-9) appears to suggest that we can identify a set of context-independent, democratically legitimated values sufficient to guide a wide range of scientific decisions, whereas Pamuk (2022: 20) holds that each instance of uncertain, high-stakes scientific decision-making is likely to require new deliberative input. More important are the levels of practical detail each provides, regarding which Pamuk’s book-length treatment is significantly more substantial. Hence, I focus on Pamuk’s proposal. [↑](#footnote-ref-7)
8. Framing the difference between majoritarian and deliberative democratic proposals as a difference in measurement procedures might seem obtuse, given the deep disagreements regarding democratic legitimacy that underpin the dispute between majoritarian and deliberative democrats. But I think it’s worth explicitly noting the relevance of political measurement to the problem of democratising science: if we’re to resolve scientific value-judgements in reference to public values, we’ll need to engage in another value-dependent measurement exercise in order to determine what those public values actually *are.* Thus framed, it seems ultimately inescapable that public values cannot determine *every* socially consequential value-judgement: pending a regress, the buck has to stop somewhere. [↑](#footnote-ref-8)
9. Of course, without access to the WHO’s internal decision-making processes we cannot determine if this occurred. Schroeder’s account tells us that, *were* majority public values referred to by the WHO when determining the outcome of non-epistemic value-judgements regarding H1N1, then this process was suitably democratic. [↑](#footnote-ref-9)
10. I refer here particularly to HPAI H5N1, a variety of avian influenza that, when first transmitted to humans in Hong Kong in 1997, proved extraordinarily pathogenic. While no strain of H5N1 has every displayed human-to-human transmissibility, the potential threat of an HPAI H5N1 strain with high transmissibility was of serious concern to public health officials throughout the 2000s (cf. Webster et al 2006). [↑](#footnote-ref-10)
11. The concept has thus far been developed in talks delivered by Andrew Buskell (2021; see also Buskell 2024) and Joeri Witteveen (2021). Note that Buskell (pers. comms.) believes ontic risk ought to be distinguished not merely from inductive risk, but also from the broader covering notion of epistemic risk. I am not yet persuaded by Buskell’s position on this point, but for current purposes this terminological issue is largely irrelevant – what’s crucial is that ontic and inductive risks are distinct, about which we are agreed. [↑](#footnote-ref-11)
12. This is not, of course, to say that ontic and inductive risks are the only varieties of epistemic risk. A significant portion of recent work on values in science has been given over to identifying varieties of value-laden underdetermination that feasibly qualify as epistemic risks (Biddle & Kukla 2017; Elliott 2017; Harvard & Winsberg 2022). [↑](#footnote-ref-12)
13. Note that I do not intend to imply that *all* updates to law are plausibly understood as requiring ontic risk assessment: it is difficult to see how an increase in goods and service taxation would provoke onticrisk. But many laws delineate socially consequential categories. Criminal law provides particularly clear examples: how we define ‘slander,’ ‘murder,’ or ‘theft’ determines what counts as slanderous, who counts as a murderer, and which goods count as stolen. It is laws of this variety that I suggest can be understood to provoke ontic risk. [↑](#footnote-ref-13)
14. It might be remarked that the issue of legal *precedent* complicates this conclusion. However, given that legal precedent is plausibly regarded as a necessary practical allowance given the likelihood that no general criterion for legality can encompass the full range of possible local phenomena (Staszewski 2023), I do not think that the fact of legal precedent obviously repudiates the basic normative account provided here. [↑](#footnote-ref-14)
15. Along with Schroeder (2021, 2022) and Pamuk (2022), see (Kitcher 2001, 2011; Intemann 2015; Lusk 2021; cf. Betz 2013). This assumption has been forcefully challenged in a recent paper from Hannah Hilligardt (2024), whose arguments I discuss below. [↑](#footnote-ref-15)
16. Such reasons might apply in cases where public values are obviously pernicious (so that, e.g., racist or sexist values cannot inform processes of scientific inductive risk assessment), or under circumstances to which considerations of ‘distributive epistemic justice’ (cf. Kurtulmuş & Irzik 2017) are relevant, as recently proposed by Ahmad Elabbar (forthcoming). But this possibility applies equally to ontic risk assessments, and so is irrelevant to my purposes here. [↑](#footnote-ref-16)
17. Although I stay focussed on H1N1 here, applied generally this effect is likely to be significantly larger: classificatory standards are *updated* far less often than they’re *applied*, and, as discussed in section 4.3., we have independent reasons to prefer that classificatory standards remain relatively stable. [↑](#footnote-ref-17)
18. An additional concern regards the possibility that democratisation might interfere with epistemic priorities. Stephen John (forthcoming: 16) has recently argued that proposals to democratise science fail to observe that “we cannot easily identify values [in science], nor easily replace them, at least without significant epistemic loss.” Space does not permit adequate engagement with this possibility here, but if it *is* the case that democratisation can incur epistemic loss, then we have epistemic reasons to prefer that as many scientific value-judgements as possible be made on a non-inclusive basis. [↑](#footnote-ref-18)
19. Hilligardt’s arguments are developed in analogy with civil services, but seem productively applicable in legal settings too. [↑](#footnote-ref-19)
20. It’s worth noting that this line of reasoning, as well as Hilligardt’s institutional perspective, seems related to the recent ‘systemic turn’ in deliberative democratic theory. Participants in the systemic turn propose that local instances of non-deliberative, discretionary decision-making can maintain democratic legitimacy when the wider political system within which they occur facilitates democratic control over the *extent* of discretionary authority vested in particular individuals (Dryzek 2010; Goodin 2008; cf. Owen & Smith 2015). Space does not permit adequate engagement with this link here, but further investigation of the systemic turn as it relates to the democratisation of science seems likely to prove fruitful in light of the arguments presented here. [↑](#footnote-ref-20)
21. This is not, of course, to say that simplicity is not a desirable quality in a political decision-making structure. Rather, what I’ve suggested is that it isn’t likely that structures sufficient to meet basic democratic expectations will prove simple *enough* to ameliorate the opportunity cost worry. [↑](#footnote-ref-21)