Varying evidential standards as a matter of justice

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Abstract

The setting of evidential standards is a core practice of scientific assessment for policy. Persuaded by considerations of inductive risk, philosophers generally agree that the justification of evidential standards must appeal to non-epistemic values but debate whether the balance of non-epistemic reasons favours varying evidential standards versus maintaining fixed high evidential standards in assessment, as both sets of standards promote different and important political virtues of advisory institutions. In this paper, I adjudicate the evidential standards debate by developing a novel argument from justice, drawing on the IPCC's assessment of climate impacts as a case study. I argue that in assessments marked by background evidential inequality, maintaining fixed high evidential standards results in an unequal distribution of 'epistemic power' among stakeholders, producing a 'powerful assessment' for the data-rich (a high rate of findings) and a 'weak assessment' for the data-poor (a low rate of findings). Where such inequalities of epistemic power disadvantage those in data-poor regions with respect to fundamental interests, such as basic human rights, we have decisive reasons of justice to vary evidential standards.

1. Introduction

The Intergovernmental Panel on Climate Change (IPCC) is well-known for adopting stringent evidential standards in its assessment and is generally lauded for doing so. Although in principle the IPCC can assess non-peer-reviewed or 'grey literature' (IPCC [2013], Annex 2), in practice these additional sources of knowledge, typically found in charity and NGO reports, as well as local and indigenous sources, are systematically excluded from IPCC reports—they are seen as lesser forms of evidence, in need of 'upgrading' via standard scientific peer-review (IPCC [n.d.], p. 4; see also Ford *et al.* [2016]; Edwards [2022]). In fact, senior IPCC authors have recently called for raising the standard of evidence even further, arguing that mere peer-review is an insufficient standard for an IPCC assessment (Minx *et al.* [2017]; Berrang-Ford *et al.* [2020]). Drawing favourable parallels with evidence-based medicine, these critics argue that climate advice should consider only the 'best' evidence according to an explicit evidence hierarchy, maintaining that nothing below systematic reviews and meta-analyses is appropriate for the IPCC's evidence base. Individual peer-reviewed studies, to say nothing of grey literature, do not meet the 'sufficient level for science-policy exchange' (Minx *et al.* [2017], p. 255).

The problem faced by the IPCC in setting evidential standards, in particular, determining the scope of potential sources of knowledge that may be admitted as evidence, is common to all assessments for policy. Placing constraints on the scope of admissible evidence is both practically unavoidable and epistemically consequential. It is practically unavoidable given the literature explosion in contemporary science, which renders a comprehensive assessment of all potentially relevant evidence unfeasible in complex assessments (Minx *et al.* [2017]). It is epistemically consequential because setting inclusion/exclusion criteria for evidence according to some epistemic standard affects the range and reliability of findings that emerge in an assessment. The general posture of the IPCC is to adopt 'fixed high evidential standards': to rank various forms of evidence according to markers of epistemic quality, setting a fixed cut-off point for assessment near the top of the hierarchy.[1] The critics cited above agree on the

[1] Given the scope of its assessments, there are many conceptions of high standards at work in the IPCC. I speak of the 'IPCC's high evidential standards' as a shorthand for a web of criteria, controls and procedures that have evolved over time and today set a high bar for the development of findings. We learn of these standards through multiple sources: some are declared in official documents, e.g., restrictions on grey literature (IPCC [2013], Annex 2), restrictions on communicating 'low confidence findings' (Mastrandrea *et al.* [2010], p. 3) and data requirements for detection and attribution (Hegerl *et al.* [2010]). We learn of others through social studies of particular IPCC controversies, e.g., over the exclusion of tentative findings on ice-sheet instability that lacked the requisite 'pedigree' (O'Reilly *et al.* [2012], p. 719; O'Reilly [2015]). Others are revealed in first-hand accounts of authors (for example, Broome [2019], p. 96; Yohe [2019], p. 305). For further discussion, see (Borie *et al.* [2021]; De Pryck [2021]; Lloyd *et al.* [2021]).

principle of adopting fixed high evidential standards, but would like to see the IPCC adopt a more explicit evidence hierarchy and set an even higher cut-off point for admissible evidence.

The question I want to ask in this paper is whether the adoption of fixed high evidential standards is justified in scientific assessment for policy. There are different ways to proceed. One would be to call into question the epistemic credentials of the strategy: to consider whether the sort of evidence hierarchies necessary for a general ranking of evidential strength across diverse types of evidence are in fact coherent and reliable. For example, important epistemic criticisms of evidence-based medicine, where hierarchies of evidence are most prominent, may lead us to worry about adopting a similar strategy in other assessment contexts (see Stegenga [2011], [2014]). Although important, I will not pursue the epistemic critique. The reason is that even if we grant that hierarchies are generally reliable in picking out the 'best' forms of evidence—the forms of evidence that are likely to yield a highly reliable assessment—the choice of evidential standards remains epistemically underdetermined: the question as to how reliable an assessment should be is not forced epistemically, but rather must appeal for its justification to non-epistemic reasons.

Let me then state the question I will address more precisely: Does the balance of non-epistemic reasons favour the adoption of fixed high evidential standards or variable evidential standards in assessments? This question has emerged as an important locus of debate in the values-in-science literature (Douglas [2009], [2017]; John [2015a], [2015b], [2017], [2019a], [2019b], [2021]; Steel [2016]; Boulicault and Schroeder [2021]; Schroeder [2021]). There are, at present, strong arguments on both sides. My aim is to adjudicate this debate by introducing a novel consideration: In contexts marked by background evidential inequality, maintaining fixed high evidential standards results in an unequal distribution of epistemic goods among stakeholders, producing a 'powerful assessment' for the data-rich (a high rate of findings) and a 'weak assessment' for the data-poor (a low rate of findings). Where such inequalities of epistemic power disadvantage those in data-poor regions with respect to fundamental interests, such as basic human rights, we have decisive reasons of justice to reject fixed high evidential standards in favour of variable standards. The argument fills a gap in the inductive risk and values-in-science literature, which has not yet brought concerns of justice to bear on the evidential standards debate.

I proceed as follows. Section 2 offers the theoretical background for the discussion, describing the epistemic trade-off between reliability and power at stake in the adoption of evidential standards. Sections 3 synthesises the arguments on both sides of the debate over fixed high standards versus variable standards. Drawing on the IPCC's assessment, Section 4 reveals

the significance of background evidential inequality for the debate, highlighting inequalities of epistemic power that result from maintaining fixed high evidential standards. Section 5 adjudicates the debate by appealing to distributive epistemic justice. Section 6 concludes.

2. Generalised inductive risk: reliability versus power

Let us begin with the standard construal of the inductive risk argument. In the standard formulation (Rudner [1953]; Douglas [2000]), since evidence never provides conclusive support for empirical hypotheses, when scientists accept or reject a hypothesis on a given body of evidence they risk one of two errors: a false positive error (accepting a claim that is in fact false) or a false negative error (rejecting a claim that is in fact true). As such, when scientists set an evidential standard somewhere along the process of inquiry, they are implicitly trading off two parameters of epistemic reliability: (a) 'positive reliability', the virtue of rendering true positive judgements, or avoiding false positives, and (b) 'negative reliability', the virtue of rendering true negative judgements, or avoiding false negatives. In this standard setup, these two parameters of reliability are systematically in tension: one cannot increase the reliability of positive results without simultaneously affecting the reliability of negative results, and *vice versa*. In this basic setup, there is no objective notion of what constitutes a higher/lower evidential standard, since one type of error is always at stake. Rather, a judgement that a standard is high/low can be made only relative to the type of epistemic reliability it promotes—a high standard for avoiding false positives is, *ipso facto*, a low standard for avoiding false negatives, and *vice versa*. From this basic setup, the familiar argument from inductive risk (AIR) for the value-ladenness of science follows: In situations where false positive/negative errors have non-epistemic consequences, a responsible management of inductive risk requires, on moral grounds (see Betz [2013]; John [2015a]), consideration of non-epistemic values.[2]

As Steel ([2016]) and Wilholt ([2013], [2016]) point out, however, this standard construal of AIR is limited in an important way. Once we move beyond simple binary tests that invariably

[2] The fallibility premise at the heart of the AIR has been contested, notably by Betz ([2013], [2017]), who argues that hypotheses can be 'hedged' to such a degree as to avoid error risks entirely. This paper will not respond to the hedging defence, as numerous arguments already exist in the literature that either support the fallibility premise directly or develop moral arguments against the hedging defence. Arguments directly supporting the fallibility premise show that the risk of error carries over to the process of hedging hypotheses itself (Steele [2012]; John [2015b]; Steel [2016]), or that even logically weak claims can communicate to audiences messages that go beyond the evidence depending on how they are hedged (John [2015a]; Lewens [2019]; see also Franco [2017]). Moral arguments against the hedging defence maintain that even if hedging can render hypotheses 'error free', the strategy is morally dubious, as highly hedged claims are difficult to interpret without expertise and thus fail to aid policymakers (Steele [2012]; John [2015b]; Steel [2016]; Frisch [2020]). I take these arguments to be collectively successful in showing that although hedging has a place in scientific advice, hedging all the way, under all circumstances, fails as a response to the AIR.

yield either a positive or negative outcome, a third option opens up to inquirers: namely suspending judgement on the outcome of an assessment, refraining from either accepting or rejecting the hypothesis of interest until further evidence is available that reduces the risk of both types of error. Taking this third option may lead simply to silence on certain topics in an assessment. For example, in a recent IPCC report, authors reported 'no assessment' in various tables and figures in cases where the evidence was deemed insufficient, specifying their standard explicitly at times: 'no assessment (if less than three papers were assessed per cell)' (IPCC [2019], p. 526, see also Figure SPM.2). In other cases where hypotheses of particular social interest are under consideration, suspension of judgement is typically accompanied by a careful statement of agnosticism from authors and a call for further research. To get a sense of what this looks like in practice, consider a paradigm example from the IPCC's First Assessment Report (1990), where authors suspended judgement on the assessment's key question, the so-called 'detection problem'—whether the warming observed in recent decades was anthropogenic:

> […] it is not possible at this time to attribute all or even a large part of the observed global mean warming to the enhanced greenhouse effect on the basis of the observational data currently available. Equally however we have no observational evidence that conflicts with the model based estimates of climate sensitivity. Thus because of model and other uncertainties we cannot preclude the possibility that the enhanced greenhouse effect *has* contributed substantially to past warming nor even that the greenhouse induced warming has been greater than that observed, but is partly offset by natural variability and/or other anthropogenic effects. (Wigley and Barnett [1990], p. 254, emphasis in original)

The authors go on to explain that, according to their standard of reliable detection, 'the time frame for detection is likely to be of order a decade or more' (Wigley and Barnett [1990], p. 253), and that further investments in modelling and observation are crucial to meet this standard.[3] Here, unlike in the binary case of accepting/rejecting hypotheses, where 'high' evidential standards can only be defined relative to the error they reduce, recognising suspension of judgement as a choice in assessment allows us to define an objective notion of high evidential standards that promotes 'overall reliability': reducing the risks of both false

[3] This use of 'detection' to refer to the problem of discerning anthropogenic influence is outdated. In contemporary usage, linking an observed climatic change to a causal factor goes by 'attribution' (Hegerl *et al.* [2010]). For a description of the stringent 'detection strategy' adopted by the IPCC in its early days, see (Schlesinger [1991], pp. 593–602); for critical reflections, see (Risbey [1989]) and (Hasselmann [1998]).

positives and false negatives simultaneously by suspending judgement under significant uncertainty. This is the sense of high evidential standards that will concern me in this paper. For now, it is enough to work with an intuitive sense of when an evidential standard is 'high'— I have in mind standards such as those requiring 95% confidence before adjudicating a hypothesis either way or requiring that the evidence base be constituted exclusively of meta-analyses.

From the recognition of this third option, Wilholt ([2016]) proposes a generalised concept of inductive risk to include not only the epistemic trade-off between positive reliability and negative reliability, but also the trade-off between overall reliability on the one hand and what he calls the 'power' of an assessment on the other: 'the rate at which a method or type of inquiry generates definitive results, given a certain amount of effort and resources' (Wilholt [2016], p. 227). If all we care for in an assessment is reliability, then 'high reliability of both types of results usually comes cheap'— namely by simply waiting for more evidence (Wilholt [2016], p. 227). But securing reliability at the expense of power involves an epistemic trade-off, since both reliability and power are epistemic virtues: aiming for the truth in an assessment 'implies not only that we want reliable results, but also that we want results' (Wilholt [2016], p. 227). Hence, trade-offs between reliability and power are, in general, epistemically underdetermined (see also Steel [2016], p. 705).

By incorporating suspension of judgement as part of the explicit structure of inductive risk, this 'generalised AIR' is not vulnerable to the retort that inductive risks can be simply avoided by suspending judgement, as this response has bite only on a narrow construal of inductive risk exclusively in terms of error. Furthermore, the value of this added structure helps make explicit the difference between a 'negative assessment' and 'no assessment', which in turn helps separate various charges directed at assessments that are often loosely subsumed under the category of false negative risks. For example, one charge directed at the IPCC is that when it assesses the evidence, it displays a bias towards 'erring on the side of least drama': rejecting surprising claims in the underlying literature that point to higher rates of climate change in favour of conservative estimates (Brysse *et al.* [2013]). A second charge is that the IPCC often suspends judgment entirely in the face of uncertainty, as represented by the above quote. The worry here is that suspending judgement in fear of error leads to 'dangerous reticence' (Hansen [2007]). For example, suspending judgement for a decade on the detection problem, as the IPCC's First Report suggested, reduces the risk of error at the expense of withholding vital expert judgement from the public. Although both of these worries are often framed in the literature as a concern that the IPCC favours the avoidance of false positives at the risk of false negatives (see Lloyd

and Oreskes [2018]; Lloyd *et al.* [2021]), only the first, bias charge, is properly described in terms of error. The second, reticence charge, is best understood as a worry that the IPCC sets an unacceptable trade-off between overall reliability and power, not type-I and type-II errors.

It is this second reticence concern that is at stake in the IPCC's high evidential standards, and even more so in the extreme proposal cited in the introduction, recommending that the IPCC raise its standards further and assess only systematic reviews and meta-analyses. Granting the reliability of the relevant evidence hierarchies, it follows that developing findings only on the basis of the best evidence generally reduces the risk of both types of error—by effectively suspending judgement on all results reported in the lower tiers of evidence, whether positive or negative. Given that this involves trading off power for overall reliability, a trade-off underdetermined by the aim of truth, can the adoption of such fixed high evidential standards be defended on non-epistemic grounds? Or, rather, should advisors vary their evidential standards, at times lowering them to gain power at the expense of reliability? Let us consider the main arguments in this debate.

3. Debating evidential standards: the political virtues of institutions at stake

In this section, I synthesise the debate over the setting of evidential standards in terms of a trade-off between different sets of political virtues of advisory institutions. I suggest that disagreements over whether to adopt variable standards versus maintain fixed high evidential standards (hereafter, FHES) reflect different weightings of at least the following institutional virtues: beneficence, responsiveness, platform neutrality and efficiency. I focus on the positive arguments that seek to show how these four virtues are promoted/undermined by the choice of evidential standards, setting aside potential objections that could be raised in response to each argument. In doing so, my aim is not to assess in detail the merits of each argument in the present debate; rather, my aim is to suggest that plausible positive arguments exist both for and against FHES, in order to motivate a novel consideration (namely distributive epistemic justice) that has not yet shaped the debate.

3.1. Variable standards: beneficence and responsiveness

Perhaps the most basic argument in favour of adopting variable evidential standards is the broadly utilitarian argument from 'general beneficence': a concern for promoting the overall good.

The beneficence argument for variable standards goes as follows. Since the probable consequences of accepting/rejecting a claim under uncertainty versus suspending judgement vary depending on the hypothesis under consideration, maintaining FHES that invariably favour reliability without reference to context amounts to blocking considerations of beneficence from guiding scientific advice. On the assumption that scientific advice should be subject, at least in part, to a utility calculus, maintaining FHES is unjustified. The proviso that utilitarian concerns should have a role 'at least in part' captures the idea that one need not be committed to utilitarianism as a general moral theory to be moved by the beneficence argument, provided that some concern is given for utility in assessing the decisions of social institutions (Beauchamp and Childress [2001], Chapter 5). The beneficence argument has played a central role in justifying variable evidential standards in assessment (see Rudner [1953]; Douglas [2009]; Steele [2012]; Frisch [2020]), and features implicitly in public debates over responsible scientific advice under uncertainty, for example, in Hansen's ([2007]) 'dangerous reticence' critique of the IPCC—that it risks 'lock[ing] in future disasters' by suspending judgement for fear of error.

The second argument in favour of variable standards is what we might call the argument from 'institutional responsiveness'. An advisory institution is 'responsive' if epistemically unforced choices in its assessments are amenable to the values of those who rely on them. Responsiveness may be interpreted strongly, as requiring that advisors strictly align value judgements with the values of policymakers or the public, in cases where such values are reasonable (see Schroeder [2017], [2021]), thereby 'taking the scientist's values out of the equation' (Schroeder [2022a], p. 57). Responsiveness may also be interpreted weakly, as requiring scientists to 'factor in' stakeholders' values without requiring scientists to put aside their own 'hard earned normative knowledge' (Alexandrova [2018], p. 432), allowing that the ultimate choice made by advisors may misalign with their audience's values. For example, considerations of beneficence may rightly persuade scientists to mitigate risks to which the public is in fact indifferent (see Wilholt [2022], p. 91). On both strong and weak readings, responsiveness favours variable standards: maintaining FHES effectively denies the public a say in the management of inductive risk,[4] as the reliability/power trade-off is struck without factoring in how the public weighs, say, false alarms versus delayed warnings in a particular context of risk (see Kurtulmus [2022]).

[4] At least where the public itself does not coincidentally prefer the high standard adopted.

In summary, if we think that either beneficence or responsiveness (or both) are virtues of social institutions that extend to scientific assessments for policy, then it seems we have reasons to want advisors conducting assessments to vary their evidential standards under inductive risk. Let us now consider the positive arguments for FHES.

3.2. Fixed high evidential standards: platform neutrality and efficiency

The non-epistemic case in favour of FHES has been most forcefully developed by John ([2015a], [2015b], [2017], [2019a], [2019b], [2021]), drawing on a range of case studies and social-epistemic considerations, notably of public epistemic trust in science (see Wilholt [2013]; Irzik and Kurtulmus [2019]). In summary, John argues that the gains secured by varying evidential standards come at an unacceptable cost to two political virtues of science for policy: (a) the neutrality of scientific claims with respect to the diverse values of policymakers, a virtue I will refer to as 'platform neutrality'; and (b) the 'efficiency' of scientific expertise in public policy.

To motivate the first concern, John draws attention to the special role scientific claims occupy in contested political deliberations. Scientific claims are often treated as being above political contestation: IPCC reports, for example, are taken as 'authoritative' in the UNFCCC, providing a shared 'depository' of facts that all decisionmakers can accept (see Kitcher [2011], Chapter 4), whether they represent the interests of fossil-fuel economies or Small Island Developing States. The privilege of science as 'epistemic common ground' (John [2021], p. 5) seems important to preserve, especially where collective political action is necessary and where no normative consensus exists. But this special capacity of assessments, to produce a set of claims that cannot be reasonably rejected as common ground for policy by any audience, seems threatened if scientists varied their evidential standards. Given their political interests, some may require a high standard of evidence before relying on a claim in policymaking. If authors were to vary their evidential standards, lowering them at times, then a portion of their audience can reasonably reject at least a subset of their assessment on political grounds, arguing that the relevant findings were based on evidence that is insufficient in light of their political interests (see John [2017]). The argument for FHES follows straightforwardly: If we want scientific assessments to serve as common epistemic ground, scientists should adopt high evidential standards—high enough to deliver findings that stakeholders with diverse interests can accept as certain enough for policy (John [2015a], [2021]).

Before moving on, note that, in principle at least, there is one way of varying evidential standards that secures platform neutrality. Namely, if evidential standards are varied in line with 'democratic values'—the values of the public or their representatives (Schroeder [2021]; see also Intemann [2015]; Lusk [2020], [2021]). To illustrate, suppose scientists were able to discern how the majority of the public would want inductive risks to be managed in a particular context, and suppose the public's values are reasonable (see Schroeder [2022b]). If it turns out that the majority has a strong preference for acting pre-emptively despite the risk of error, then scientists may lower their evidential standards to match the democratic choice. Although a minority may favour a higher evidential standard than the majority view, they still ought to accept the assessment's findings as common epistemic ground for policy, as the democratic choice has political legitimacy even for those who disagree with it (Schroeder [2021], p. 556). If it were possible to rely on democratic values, then varying evidential standards democratically can lead to assessments that secure both virtues of platform neutrality and responsiveness. In practice, however, I think FHES will typically prove to be the only standard that can secure platform neutrality: whether democratic values can realistically guide scientific assessment is an open question even in domestic contexts (see Boulicault and Schroeder [2021]); scaling up to assessments with global implications and indeterminate publics, such as IPCC assessments, raises deep theoretical and practical challenges for the democratic approach that remain open (Schroeder [2021], p. 554, Footnote 17). As such, I grant that a concern for platform neutrality will generally favour FHES over variable standards.

Let us now turn to efficiency. To see how adopting FHES promotes efficient public policy, consider that once a scientific finding has been established at a high evidential standard, such that no audience can reasonably fail to accept it, the relevant finding becomes 'portable' (John [2019b], p. 29), travelling between policy contexts and crossing borders, without the need for each individual policymaker to query whether the finding is sufficiently established for their practical purposes. By contrast, if scientists were to vary their evidential standards, either on grounds of beneficence or in response to the values of a particular audience, the results of their assessments would be indexed to a specific policy context and cannot be automatically transferred without querying the evidential standards assumed and whether they are sufficient for the new context. The labour involved in perpetually investigating the inductive risk choices adopted in previous assessments for each new policy decision is surely undesirable from the

perspective of public policy under time and resource constraints. Thus, the argument from efficiency for maintaining FHES is plausible.[5]

Finally, note that efficiency, unlike platform neutrality, appears fundamentally linked to FHES. In other words, even in principle, it is hard to see how varying evidential standards can preserve efficiency, including where standards are varied democratically. To see this, it is enough to consider the following: (a) Democratic values are not fixed, but rather change over time, thus a balance of inductive risk that is apt for a public at time t_1 may become inapt by t_2. (b) The evidential threshold demanded by the public will vary for a given hypothesis depending on its context of application, and therefore findings developed on the basis of democratic values in one policy context cannot be assumed in another policy context even within a single domestic setting and timeframe—the public may balance the inductive risks for the hypothesis, 'Masks are safe and effective in reducing virus transmission', differently depending on whether it is relied on for travel policy versus school policy. (c) Scientific assessments increasingly speak to issues that cross borders and thus may be sought out by different domestic publics for their ends. Parochialism is thus a risk in the democratic approach for any assessment with international relevance. As such, although democratic values are, at least in theory, compatible with platform neutrality for policymaking in a prescribed context, the assessments thus produced are not 'portable' to unanticipated contexts, thus compromising on efficiency.

Rather than adjudicating this challenging debate from within, I will introduce a novel argument in favour of variable evidential standards that appeals to justice. If it turns out that justice favours variable standards, I contend that we have all-things-considered reasons to reject FHES, since either we take justice to be the preeminent virtue of institutions, constraining the pursuit of other virtues, such as efficiency (Rawls [1999]), in which case the conclusion follows immediately; or we take justice to be a weighty if not preeminent virtue (Cohen [2008], pp. 302–306), in which case the conclusion still follows, given the already fine balance of arguments for and against FHES surveyed above—in other words, justice 'tilts the balance' in favour of variable standards. The argument from justice begins from contingent facts about the distribution of evidence in our world that have so far been neglected in the debate over the setting of evidential standards.

4. Setting standards against a background of evidential inequality

[5] The efficiency argument for FHES is particularly compelling for IPCC-type complex assessments, where the costs of reassessment are prohibitive. On the challenges of reproducing the IPCC's assessment, see (PBL [2007]).

To motivate my concern in this section, consider a stylised example. Imagine a world formed of two regions. The first region is 'data-rich' with respect to some scientific question, such that there is abundant high-quality peer-reviewed evidence to draw from that is pertinent to the interests of stakeholders in this region, whereas the second region is 'data-poor' by comparison. Now, suppose an assessment was conducted encompassing both regions, and scientists adopted FHES. What would we expect the resultant distribution of findings to look like? Drawing on the trade-off between reliability and power, introduced in Section 2, we would expect the assessment to secure overall reliability; but we would also predict a 'powerful assessment' for the data-rich (a high rate of findings) and a 'weak assessment' for the data-poor (a low rate of findings). In other words, FHES secure overall reliability at the expense of an 'inequality of epistemic power' between the two regions.

Stylised as the above example is, it nevertheless captures the general shape of the distribution of peer-reviewed climate evidence in our world. There is a stark asymmetry in climate research that divides (roughly) the Global North and the Global South, with a disproportionate majority of peer-reviewed evidence on climate change focusing on the Global North. To put it mildly, climate science as a discipline is not well-ordered (Kitcher [2001])—its research agenda is not properly geared towards the interests of those most vulnerable to climate change, as demonstrated by an overwhelming number of studies. Taking the literature on climate impacts as an example, consider the following: In a recent mapping of 100,000 climate impact studies, Callaghan *et al.* ([2021], p. 968) found inequalities in the geographic distribution of research that misalign with vulnerability to climate change, with 'Africa and Asia receiving the least attention per million inhabitants'. A recent *Lancet* study on the health-related impacts of climate change found that 'the evidence base is dominated by studies from high-income countries' with 'scant evidence from low-income counties, which often suffer most from the health consequences of climate change' (Berrang-Ford *et al.* [2021], p. e514). In numbers, they found that 79% of 15,914 studies focus on high-income and upper middle-income countries. In a review of the literature on climate impacts on cultural heritage sites, Sesana *et al.* ([2021], p. 20) conclude that the evidence base is skewed towards heritage sites in Europe, North America, Australia, and New Zealand, revealing 'a paucity of studies' on other regions. In their global review of the literature on heatwaves from 1964–2017, Campbell *et al.* ([2018], p. 212) found that the 854 heatwave study sites reported in the literature were distributed as follows: 584 were in North America, 144 in Europe, 91 in Asia, 34 in Australia, 1 in South America, and 0 in Africa. They conclude that those underrepresented in the literature are 'the global populations most at risk of death and illness from extreme heat' (Campbell *et al.* [2018], p. 210). In a

complementary global review of heatwave research, Green *et al.* ([2019], p. 85) found similar results, and noted that in 'some Australian cities like Brisbane or US cities like Phoenix there have been more studies conducted than the entire continent of Africa'.[6]

It is against this background of evidential inequality that the IPCC is conducting its assessments and setting evidential standards. To its credit, IPCC WGII acknowledged this inequality in AR5, conducting its own analysis of the evidence base, warning readers that 'the unequal distribution of publications presents a challenge to the production of a comprehensive and balanced global assessment' (IPCC [2014], p. 38). Nevertheless, it is clear that WGII adopted FHES for assessing the impacts to climate change, particularly when making attribution claims, as senior authors of its chapter on attribution explained in defending the 'standards' they adopted:

> Scientific attribution of observed impacts to climate change requires time series of observations of sufficient length and quality for the affected system, and for both climatic factors and other important drivers of change, such as land use or economic development. Mere correlation between the changing climate and its presumed impacts is insufficient for attribution. Instead, understanding of all of the likely causes of change and their interaction is needed. For a specific impact to be included in an IPCC assessment, a diligent examination of that specific case in the peer-reviewed literature must be available. (Hansen and Cramer [2015], p. 182)

Against the background of evidential inequality surveyed above, and the stringency of the evidential standards represented by the above quote, it is not surprising to learn that the IPCC reported more impacts due to climate change in high-income developed nations compared to developing nations, despite the consensus that developing nations are experiencing the brunt of climate change impacts (see Huggel *et al.* [2016]). The following, remarkable finding from a text mining study of loss and damage due to climate change in WGII evidences this skewed assessment:

> […] surprisingly, WGII AR5 mentions *developed* countries much more often in relation to loss and damage. The words Europe, Australia, North America and United States cooccur with loss/damage about three times more often than the words Asia, Africa,

[6] For further analyses of such evidential inequalities and their causes, see (Pasgaard *et al.* [2015]), (Hansen and Cramer [2015]), (Huggel *et al.* [2016]), (Hendrix [2017]), (Brönnimann and Wintzer [2019]), (Pfalzgraf [2021]).

> Latin America and the Pacific […] Germany is mentioned in connection to loss/damage more often than the entire Caribbean and almost twice as often as an extremely vulnerable country like Bangladesh. (van der Geest and Warner [2020], p. 10, emphasis in original)

In summary, by giving all attention to reliability in an evidentially unequal world, the IPCC produced a powerful assessment for the Global North and a weak assessment for the Global South. I will now argue against the adoption of FHES, on grounds of justice, given its tendency to produce such inequalities in the distribution of epistemic power.

5. Varying evidential standards as a matter of justice

The previous section highlighted the significance of setting evidential standards against background evidential inequality, namely that adopting FHES results in an inequality in the rate at which findings are produced for data-rich versus data-poor regions—an inequality of epistemic power—and offered the IPCC's assessment of climate impacts as an example. From this insight, I will now argue against adopting FHES in contexts of background evidential inequality on grounds that doing so unfairly disadvantages those in data-poor regions with respect to fundamental interests and is thus unjust. The argument draws on, and extends, the pioneering work of Irzik and Kurtulmus on distributive epistemic justice. In particular, it extends their discussion of distributive epistemic justice from domestic to global institutions and makes good on their suggestion that problems of inductive risk in science can be fruitfully analysed as problems of distributive justice. I develop the general justice-based argument against FHES first, and then apply it to climate assessment.

5.1. The general justice-based argument

Before presenting the formal argument, let me begin with some background, summarising the core intuition that motivates linking epistemic distributions to justice in the first place.

In recent papers, Irzik and Kurtulmus offer a framework for thinking about justice in the distribution of knowledge, covering both knowledge production and dissemination, arguing that critical epistemic institutions are subjects of justice (Irzik and Kurtulmus [forthcoming]; Kurtulmus and Irzik [2017]; Kurtulmus [2020]). More precisely, Irzik and Kurtulmus argue that epistemic institutions are subjects of justice wherever the knowledge they produce is necessary for satisfying already existing requirements of justice, as specified by one's preferred

theory of justice. For example, if we think justice demands equal protection of basic rights, and if it turns out that a particular kind of knowledge is necessary for securing equal protection of these rights, then the production and dissemination of that knowledge is a matter of justice, and avoidable failures to do so constitute distributive epistemic injustice.[7] By placing 'epistemic goods' within the scope of justice, their framework responds to the neglect of knowledge in existing theories of justice, 'despite the fact that knowledge is a good no less important than standard goods like income, wealth, liberties and opportunities' (Kurtulmus and Irzik [2017], p. 143), and that systematic deprivations of knowledge underpin so many injustices in our world, such as injustices in healthcare provision, in income and wealth distribution, political participation, and more (Kurtulmus and Irzik [2017], pp. 128–34; Kurtulmus [2020], pp. 822–24). It is this basic intuition concerning the central importance of knowledge to the pursuit of social and political justice, which I share with Irzik and Kurtulmus, that leads me to reject FHES in assessments marked by background evidential inequality, as I will argue shortly.

Despite the richness of their framework, however, Irzik and Kurtulmus's discussion of it is limited in scope, focusing on domestic cases of distributive epistemic in/justice. This domestic focus is evident both in the way in which they explicate their framework and in the examples they offer (see Irzik and Kurtulmus [forthcoming]). This is not a criticism of their initial focus, as it makes sense to begin by linking the distribution of knowledge to more established theories of domestic justice, such as Rawls's theory. However, given the immense influence, or 'world-making power' (Beck and Mahony [2018]), of global assessments such as the IPCC's, it is crucial that we begin exploring 'global distributive epistemic justice', justice in the distribution of knowledge by global epistemic institutions, drawing on theories of global justice, for example, theories of climate justice. The following discussion is a first attempt to do so in the spirit of Irzik and Kurtulmus's framework.

With this background in place, I will summarise the justice-based argument against FHES:

P1. In assessments marked by background evidential inequality, maintaining FHES results in an unequal distribution of epistemic power across data-rich and data-poor regions, with data-rich regions receiving findings at a higher rate than data-poor regions.

[7] Irzik and Kurtulmus are making a weak assumption here: they are assuming that epistemic distribution is a matter of justice only in cases where knowledge is 'instrumentally' valuable for social ends. Others have advanced more capacious notions of distributive epistemic injustice, grounded in the 'intrinsic' value of knowledge, making the distribution of 'interesting' knowledge a matter of justice whether or not it furthers social/political interests (Coady [2010]; see Kurtulmus and Irzik [2017], Footnote 3). I follow Irzik and Kurtulmus's weaker assumption in this paper, as establishing a duty of justice to vary evidential standards in scientific assessments requires nothing more than the recognition that they inform public policy.

P2. There are cases where such power inequalities disadvantage those in data-poor regions with respect to fundamental interests, grounding claims of distributive epistemic justice.

P3. In some of these cases, it will be possible to mitigate power inequalities by varying evidential standards to the advantage of those in data-poor regions.

C. When conducting assessments against background evidential inequality where 2–3 obtain, we have reasons of justice to vary evidential standards.

Let us unpack this argument. Given that the first premise has been established, I will focus on explicating premises 2 and 3.

P2 contains two claims. The first is a descriptive claim: that power inequalities sometimes leave people in data-poor regions disadvantaged with respect to 'fundamental interests': interests that are weighty enough to place duties of justice on others—think of the sort of basic needs to which human rights are typically ascribed (Caney [2006]; Shue [2020]). Of course, precisely which bundle of human interests are 'fundamental' in this sense, grounding claims of justice, is an open question in political philosophy (see Brighouse and Robeyns [2010]). As such, when applying the justice-based argument to a specific context, we must specify what constitutes fundamental interests to know whether they are at stake in the distribution of epistemic power (and I will do so when applying the argument to climate assessment). For now, I leave the notion of 'fundamental interests' unspecified as a catch all term for the familiar and uncontroversial sorts of basic needs that form a common concern for broad theories of justice. I take it that this descriptive claim is uncontroversial. Scientific assessments are routinely commissioned to inform policies that aim to safeguard vital human interests: to mitigate serious threats to life, subsistence, and health, for example. At least in some such cases, receiving findings at a lower rate than others will lead to one's disadvantage with respect to these interests.

The second claim in P2 is normative: In cases where persons are disadvantaged with respect to fundamental interests owing to the distribution of epistemic power, their disadvantage grounds claims of distributive epistemic justice. By 'claims of distributive epistemic justice', I mean claims of the following form: Epistemic institution, *E*, has a duty of justice to modify its epistemic practice, *P*, to mitigate the disadvantage of *A*, if it can.[8] This second claim is a straightforward application of Irzik and Kurtulmus's framework of distributive epistemic justice, summarised above, to the distribution of epistemic power.

[8] See Gilabert ([2011], pp. 55–56, and [2017]) for a general discussion of such 'evaluative' claims of justice that take this conditional form, '*E* ought to do *X*, if they can', which can be properly made before attending to the feasibility of the obligations they mention.

Note that since P2 is formulated for cases where 'fundamental interests' are at stake, it does not matter for the purposes of the argument whether we read 'disadvantage' in the premise as 'relative' disadvantage (power inequalities leave those in data-poor regions worse off compared to others with respect to fundamental interests) or 'absolute' disadvantage (leaves them badly off with respect to fundamental interests). Egalitarians may wish to accent relative disadvantage as the reason that grounds claims of distributive epistemic justice, because unequal protection of fundamental interests is incompatible with the principle of equal respect and concern. Sufficientarians may accent absolute disadvantage, because fundamental interests define a moral threshold below which no person should fall. Assuming one accepts that knowledge distribution is a concern of justice where fundamental interests are at stake, P2 follows whether we think distributive justice is ultimately concerned with relative or absolute disadvantage.

Let us turn to premise 3. There are cases where power inequalities disadvantage the fundamental interests of people in data-poor regions (where P2 holds), but where their situation cannot be improved by varying evidential standards. This may simply be because the evidence on a region is so scarce that no further findings can be developed by lowering standards; in other words, lowering evidential standards would produce claims that are so unreliable that they do not constitute epistemic goods at all. Or it may be because increasing power would expose people in data-poor regions to intolerable risks of acting on error (recall the systematic tension between power and reliability). For example, one might think that the IPCC should adopt FHES when recommending specific adaptation measures in Least Developed Countries, because the worst-case scenario for these countries might be that they expend scarce resources on ineffective adaptation policies that leave them maladapted to climate change with fewer resources to cope. In such cases, the power inequality is regrettable, but it is 'innocent' in that it merely reflects the background evidential inequality and not the neglect of the interests of data-poor regions by an assessment. P3 takes these possibilities into account and assumes only that in some cases where P2 holds, mitigating power inequalities by lowering evidential standards is possible—in other words, would still produce epistemic goods—and doing so would be to the advantage of data-poor regions. The conclusion then follows.

In summary, background evidential inequality is a morally significant factor that ought to inform the setting of evidential standards. Indeed, under the conditions described above, the presence of background evidential inequality can establish a duty of justice to vary evidential standards in assessment. To round off the discussion, let us apply this argument to the context that motivated it, the IPCC's assessment of climate impacts.

5.2. Applying the argument to climate assessment

In Section 4, we saw that the IPCC assessment of climate impacts is a paradigm case of an assessment marked by background evidential inequality; we also saw that the IPCC produces findings on climate impacts at a higher rate for the Global North versus Global South, a power inequality exacerbated by the IPCC's maintenance of FHES (P1 holds). The question, then, as to whether justice demands varying evidential standards in the IPCC rests on whether we think that this power inequality leaves those in the Global South disadvantaged with respect to fundamental interests (whether P2 holds), and whether the IPCC can mitigate their disadvantage by varying evidential standards (whether P3 holds). I will answer Yes to both of these questions and anticipate objections.

Are the interests at stake in climate assessment 'fundamental', namely weighty enough to establish claims of justice on the IPCC if its distribution of power leaves these interests unequally protected? The answer to this question is a straightforward Yes, even on the most conservative scoping of fundamental interests. To see this, take Caney's ([2006], [2010]) deliberately minimal approach to climate justice. Caney argues that climate change demands a political response as a matter of justice because climate change jeopardises three fundamental interests, to which he ascribes basic rights: the right to life, health, and subsistence. Protecting these rights in a changing climate—setting just mitigation targets, allocating sufficient adaptation funding, compensating for loss and damage—presumes knowing the impacts people are suffering, especially in regions most vulnerable to climate change. Power inequalities in climate assessment thus disadvantage those in data-poor regions with respect to fundamental interests (even on Caney's minimal list), rendering less visible the extent of climate impacts in their region, leaving them at an epistemic disadvantage in political negotiations that bear crucially on the protection of these rights (Farand [2021]; Olsson *et al.* [2022]). Of course, if we look beyond Caney's minimal list of fundamental interests and adopt a broader list, drawing, for example, on capabilities-based theories of climate justice (see Holland [2008], [2012]), we will recognise that power inequalities in the IPCC risk a broader range of disadvantages for data-poor regions beyond jeopardising rights to life, health and subsistence, including jeopardising the protection of land and property, cultural heritage sites, and communal ways of life and group identities. (Schlosberg [2012a], p. 455). Furthermore, note that the inequality of power represents an unequal 'recognition' of the victims of climate change. Recognition-based theories of justice would take such unequal recognition of impacted peoples as itself an injustice, sufficient to ground claims of justice on the IPCC, even before we examine the downstream

effects of such non-recognition for the protection of other fundamental interests (see Schlosberg [2012a], [2012b]). Finally, it is worth appreciating the strength of these justice claims in the present context. To see this, note that part of why certain regions in the world are data-poor in the first place, and vulnerable to distributive epistemic injustice, is itself the result of past injustices, of colonial exploitation and deliberate scientific underdevelopment, among other wrongs (see Brönnimann and Wintzer [2019]; Pfalzgraf [2021]; Mercer and Simpson [2023]). As such, the claims of justice at stake here are particularly strong: they are claims that the IPCC should avoid inflicting 'compound injustice' (Shue [2014], p. 37), if it can.

Before moving on, let us consider a potential worry. One might accept that fundamental interests are at stake in climate assessment but question whether the 'rate' at which findings are produced is relevant to their protection. The reasoning goes as follows: epistemic power bears only a contingent connection to the protection of fundamental interests—in addition to their rate, the 'character' of findings also matters, as does the broader political context. There are surely cases where stakeholders receive findings at a lower rate than others but where the contents of these fewer findings speak so decisively in their interest so as to render the power inequality irrelevant from the perspective of justice. So, while in the IPCC, countries in the Global North receive findings on loss and damage at a higher rate than vulnerable countries in the Global South (van der Geest and Warner [2020]), it is too quick to assume that this power inequality renders less visible the latter group's vulnerability or risks their interests—given the clearer factors that shape climate vulnerability in a country like Bangladesh, it may only take a handful of siren findings to convey the urgency of its condition. As such, we need to say more to explain why the rate of findings, specifically, is morally relevant.[9]

In response, let us underscore what epistemic power tracks in climate assessment. Put simply, epistemic power is a proxy for detail and geographic coverage: a higher rate of findings on loss and damage for Germany (versus Bangladesh) reflects a finer-grained analysis of impacts in the former, going beyond generic statements at the country level to an analysis of specific tokens of impacts and their localities.[10] To ask whether the rate of findings is morally relevant, then, is to ask whether a finer-grained, geographically disaggregated analysis is relevant for protecting fundamental interests. There are three reasons for a positive answer. Firstly, for countries to access international climate finance, they are typically required to provide substantial evidence of local impacts that goes beyond evidencing their country's overall

[9] I thank an anonymous reviewer for raising this worry.
[10] See Huggel *et al.*'s ([2016], p. 905) geographic mapping of the IPCC's findings on climate impacts, which evidences the finer-grained analysis for the Global North.

vulnerability. Such evidential demands are partly responsible for the fact that some of the most vulnerable countries fail to secure climate finance—as a delegate from Liberia put it to the UN's Green Climate Fund, 'people die because they don't have the data' (Farand [2021]; see also Garschagen and Doshi [2022]).[11] In this political context, IPCC reports are an important resource for vulnerable countries, mined for relevant findings to advance their interests (Tschakert [2015]). In an ideal world in which international institutions awarded climate funding liberally on the basis of a country's overall vulnerability, power inequalities in the IPCC may be less concerning, but we do not live in such a world. Second, for local planners to adapt to climate change and protect their homes, land, and cultural heritage sites from climate extremes, they require climate information at the relevant granular scale—generic findings on a region's vulnerability, no matter how unequivocal and salient, are of limited relevance from the perspective of local decision making (see Rodrigues and Shepherd [2022]). 'Adaptation', as Sobel ([2021], p. 8) puts it, 'is local': 'it is different everywhere'. Finally, recall the perspective of recognition justice mentioned earlier: high-level findings on the overall vulnerability of a region cannot accord due recognition to the variegated experiences of its people—recognition is responsive to 'difference', tracking 'specific and local vulnerabilities […] in various places and under different conditions' (Schlosberg [2012a], p. 446), and thus presumes disaggregation. Therefore, I conclude that P2 holds—power inequalities in the IPCC disadvantage those in data-poor regions with respect to fundamental interests. Let us then consider whether P3 holds.

Given how high the evidential bar is set in the IPCC,[12] it is clear that power inequalities in its assessments can be mitigated by relaxing evidential standards for data-poor regions. Even if we restrict our focus to peer-reviewed evidence, the institution could empower its authors to develop findings for data-poor regions on the basis of fewer tokens of evidence, as the demand for multiple studies of a single issue is routinely made of authors (see Yohe [2019], p. 305). More specifically, the IPCC could relax its stringent requirements for detection and attribution in data-poor regions, as some authors have suggested.[13] Furthermore, authors could look beyond the peer-reviewed literature towards grey literature and local climate observations (Rudiak-Gould [2013]), supplemented by their own expert judgement (Mach *et al.* [2017]). Indeed, IPCC documents recognise that relevant evidence on data-poor regions exists outside peer-

[11] I thank Deborah Coen for pointing me to this literature.
[12] See references in Footnote 1, especially (Lloyd *et al.* [2021]).
[13] See Stephen Schneider's critique of the IPCC's conservative attribution standards, recounted in (Allen [2011], p. 932). To its credit, the IPCC's 'Guidance Paper on Detection and Attribution' contains a single sentence that tentatively suggests varying evidential standards: 'in data-poor regions, it may be useful to relax these criteria, although this will lead to reduced confidence in findings' (Hegerl *et al.* [2010], p. 6). The present paper gives normative support to this quiet voice within the IPCC, which, after all, is not a monolithic institution.

reviewed sources, but generally cautions against its inclusion (for example, IPCC [2010], pp. 6–8, [2017], pp. 9, 19). Given that FHES result in the undercounting of impacts in data-poor regions with the attendant disadvantages discussed above, I conclude that varying evidential standards along these lines is in the interest of data-poor regions. In short, premise 3 holds.

Before concluding, I will address two objections relating to the application of the argument to climate assessment, objections that push on P3 by questioning whether lowering evidential standards is, ultimately, in the interest of data-poor regions, or whether the strategy might somehow backfire.

Objection: The first objection to varying evidential standards in climate assessment is that it obscures the underlying problem, the background evidential inequality itself, and potentially disincentivises the sort of interventions that would, in the long-term, deliver for the Global South both a powerful and highly reliable assessment. Confronted with the background evidential inequality surveyed in Section 4, shouldn't we demand that more research be directed towards the study of climate change in the Global South? If so, isn't there a risk that producing more findings for the data-poor by varying evidential standards may mislead IPCC readers into thinking that more evidence exists on the Global South than is the case, whereas maintaining FHES would at least highlight the knowledge gap and incentivise further research? Varying evidential standards as a response to background evidential inequality may be to the short-term advantage of the data poor, but not so in the long run—the strategy amounts to placing a plaster over a deep wound.

Response: I agree that addressing the background evidential inequality directly is crucial; in other words, that the institutions of climate research responsible for producing first-order evidence should direct more of their attention to climate impacts in the Global South. But I take this aim, contra the objection above, to be fully compatible with the duty of justice on the IPCC, which has inherited this background evidential inequality, to vary its evidential standards in response. The two projects can and ought to be pursued in parallel, as we have no compelling reasons to think that varying evidential standards in the IPCC will deter efforts to strengthen the underlying evidence base in data-poor regions. Firstly, even if we thought that maintaining FHES was the best way of highlighting the background evidential inequality, exposing such inequalities would not automatically draw the attention of a global research community. The attention of scientific institutions, predominantly located in the Global North, is modulated by a myriad of biases, including researchers' interest in studying events close to home; their sense of how tractable the research question is, and how likely they are to secure funding for the project and get a 'good' publication out of it (Hulme [2014], p. 507).

Furthermore, even if we ignore such biases and assume a genuine effort to remedy the background evidential inequality on the part of climate scientists, there are limits to how far this can be achieved in the study of climate impacts. The reason is that the detection and attribution of climate impacts requires long-term observational climate data on the region under study, going back many decades—and there is no easy fix to the imbalance of historical data monitoring which is at the heart of the evidential inequality in the study of climate impacts (Huggel *et al.* [2016]). In short, maintaining FHES undermines the immediate interests of the data-poor with no guarantee of securing their long-term interests. Second, we might think that producing a more powerful assessment for data-poor regions by varying evidential standards will in fact incentivise further research on those regions, rather than deter it, as the IPCC has an 'agenda setting' role in climate science: its findings have the effect of nucleating further research, as researchers can point to the attention given to a topic by the IPCC as evidence of the issue's social relevance (Robertson [2021]). In summary, we can push back on this objection on multiple fronts.

Objection: The second objection draws on the link between reliability and trust in the IPCC. The worry goes as follows: There are cases where error poses such a great reputational risk to an institution that it is in the interest even of those in data-poor regions, all things considered, that its assessments maintain FHES. Trust in the IPCC is fragile, hinging on its high reliability. Errors in previous IPCC reports posed serious threats to its reputation and, in turn, its policy relevance. Presumably, people in the Global South are better off with the IPCC continuing to inform policymakers on climate change than without it, even at the cost of undercounting impacts in their region for fear of error, and the disadvantages that follow from such undercounting. Put differently, receiving fewer findings which policymakers accept is surely better than receiving more findings that are ignored. So, although mitigating the power inequality by varying evidential standards is possible, it is not to the advantage of data-poor regions, once we consider the broader political context—doing justice by the data-poor in this non-ideal context actually requires maintaining FHES.[14]

Response: The force of this objection depends on specifying the context of assessment more precisely: namely, on specifying a particular moment in the IPCC's history and the politics of climate change. IPCC assessments, after all, span over three decades and the conditions of trust in its assessments have evolved in response to changing political pressures and expectations. The conditions of trust in the IPCC circa 1990, when the mere suggestion of an anthropogenic

[14] I thank an anonymous reviewer for pressing this objection.

influence on the climate was radically contested within and outside the IPCC's walls (De Pryck [2021], p. 83), are not the same as the conditions of trust in 2022, post the Paris Agreement and the establishment of adaptation and loss and damage funds by the Parties to the UNFCCC—the 'primary clients' of the IPCC (IPCC [2000], p. 117). During certain assessment cycles, reliability may well have been the single parameter upon which the reputation of the IPCC, and by extension its efficacy in guiding policy, rested. Let us therefore grant that at certain moments in its history, varying evidential standards would not have been in the interest of the data-poor, all things considered. But the argument of this section applies to the present IPCC in light of contemporary political expectations. Stakeholders in the IPCC are no longer singularly concerned with the avoidance of error in assessments at all costs. Rather, trust in the IPCC today rests, as Mach and Field ([2017], p. 589) argue, 'as much on perceptions of decision-making relevance and of fair, inclusive processes, as on rigorous scientific products'. To underscore this shift in the conditions of trust, note that although earlier controversies in the IPCC centred on purported errors in its reports, the most serious recent controversies arose from a concern that the IPCC is undercounting climate impacts in the Global South (see Hansen and Cramer [2015]; Olsson *et al.* [2022], pp. 6–8). In short, by focusing solely on the risks posed by error to the standing of the IPCC in policy spheres, the objection assumes too crude a view of present determinants of trust in the IPCC, assuming that developing nations will continue to cooperate with an institution that exposes them to distributive epistemic injustice. I contend, therefore, that varying evidential standards is in the interest of the data-poor, even when we factor in the risks of error to the institution's reputation.

6. Conclusion

My aim in this paper has been to adjudicate the debate in the values-in-science literature over the setting of evidential standards in assessments for policy. Namely, whether the balance of non-epistemic reasons favours the adoption of fixed high evidential standards or variable evidential standards. I began by noting that the literature has neglected a contingent, morally relevant fact in constructing arguments both for and against FHES: namely, that we live in an evidentially unequal world. I then argued that in the presence of such background evidential inequality, maintaining FHES results in inequality in the rate at which findings are produced for data-poor versus data-rich regions and that such inequalities of epistemic power can give us decisive reasons of justice to vary evidential standards in assessment. The argument thus provides a novel justification for varying evidential standards and demonstrates that problems

of inductive risk in science can be fruitfully analysed as problems of distributive justice. Furthermore, by applying the justice-based argument to the IPCC, drawing on theories of climate justice, the paper extends the analysis of distributive epistemic injustice in science from domestic to global epistemic institutions, a project to be explored more fully in future work.

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