npj | climate action

www.nature.com/npjclimataction

ARTICLE OPEN

Check for updates

International bureaucrats' attitudes toward global climate adaptation

Lisa Dellmuth[1]✉

The 2015 Paris Agreement has fueled debates about how the international bureaucrats driving international organizations' engagement with climate adaptation ought to address adaptation challenges. While previous research has predominantly focused on the structural constraints in adaptation governance, this paper develops a distinct argument about the cognitive frames through which international bureaucrats view climate risks. The evidence comes from a survey among bureaucrats in three organizations that have engaged with adaptation to different extents: United Nations Environment, the United Nations High Commissioner for Refugees, and the World Health Organization. The results suggest that the majority of the surveyed bureaucrats view climate risks as a multidimensional problem. The evidence indicates that bureaucrats are more likely to view climate risks through multiple than through single issue frames, the more certain they perceive the knowledge about climate impacts in their issue area to be. By way of conclusion, the paper sketches broader implications for adaptation and international bureaucracy research.

npj Climate Action (2023)2:40 ; https://doi.org/10.1038/s44168-023-00073-2

INTRODUCTION

Adaptation to the risks and threats posed by climate change for societies and ecosystems is an urgent priority. The pressing nature of this climate adaptation is underlined by the two million deaths caused by extreme weather events over the past fifty years[1]. The warming climate also has a range of other adverse effects, including food insecurity, risks to coastal, ocean, and terrestrial ecosystems; risks associated with critical infrastructure, networks and services; risks to living standards and human health; risks to cultural heritage; and risks to peace and migration, among others[2].

Although these climate risks might seem to be localized, they are often cross-border, making adaptation an international policy challenge[3]. This has been acknowledged in the 2015 Paris Agreement. Yet global adaptation governance has seen fierce struggles over problem definitions and solutions over the past decade[4–6]. There is considerable 'epistemic ambiguity' regarding the term 'adaptation'[7], as it means different things in different issue areas. In the area of food, adaptation is talked about in terms of crop efficiency or supply chain management[8]; in development, the focus is on reducing maladaptation and vulnerabilities[9]; and in health, climate change is framed as a driver of vector-borne diseases[10].

The failure to integrate adaptation needs across issue areas has severely undermined adaptation governance[11]. More than forty central international organizations, with mandates in both climate and nonclimate issue areas, have increasingly—yet varyingly—engaged with adaptation over the past two decades[12–14]. International bureaucrats influence these varying outcomes in adaptation policy, particularly through knowledge production and agenda-setting[3,6,15–17]. Despite there is a gap between attitudes and policy[18], bureaucrats' attitudes have contributed to shaping global adaptation governance[6,7,19–25].

Yet we have little evidence about the views of international bureaucrats working on adaptation to climate risks, as previous research has chiefly studied the structural constraints faced by such bureaucrats in adaptation[4,6,15,24]. A more general literature on international bureaucracies has established that international bureaucrats matter for global outcomes[26–28], for example through the lens of theories of policy change[29], policy integration[15], expert authority[30], and social constructivism[31]. There is also a growing literature on elite opinion in global governance providing insights into the views of international bureaucrats[32–38]. However, bureaucrats' views on adaptation remain understudied.

To address these limitations in earlier research, this paper examines the cognitive frames through which international bureaucrats view climate risks. It matters to what extent bureaucrats view climate risks as a multidimensional issue, thereby recognizing that climate risks have different impacts and problem solutions in different issue areas. When bureaucrats understand climate risks as a multidimensional issue, they accept different framings of the issue and see these framings as valuable[39]. In turn, they might be more open to mainstreaming approaches in the area of adaptation, which are crucial given the multi-issue nature of adaptation[13,23], and to collaboration across issue areas both across and within international organizations.

These observations provoke a key research question: to what extent do international bureaucrats view climate risk as a multidimensional issue and which institutional contexts foster the emergence of multi-issue frames? Cognitive frames are tools helping actors to organize information in complex problem structures[39], and to ultimately make policy decisions[40,41]. An issue frame is a type of cognitive frame, which represents coherent dimensions of an issue. This makes the notion of an issue frame relevant for the analysis of public policy[42].

My argument is grounded in a sociological institutionalist perspective, in which legitimacy-seeking bureaucrats are constrained and shaped by institutions when conforming to a set of cultural rules and norms[43,44]. Institutions refer to informal or formal communicative rules that set expectations for behavior[39]. In this vein, bureaucrats' attitudes are influenced by the degree to which they perceive the wider environment to support and legitimize their ideas[45]. The environment consists of peers and the structures in which they interact, especially but not only in the organization[46,47].

[1]Department of Economic History and International Relations, Stockholm University, 10691 Stockholm, Sweden. ✉email: Lisa.dellmuth@su.se

In terms of factors internal to an organization, peer support for adaptation engagement, for example through greater inter-organizational collaboration or speech acts, can increase bureaucrats' perceived wiggle room to address climate risks[12,16]. In such circumstances, it is more likely that bureaucrats perceive of multi-issue frames as more legitimized and recognize climate risks as a multidimensional issue. By contrast, when peer support for adaptation engagement is weak, bureaucrats are more likely to view adaptation as a pure climate issue as other framings, such as a health framing, do not appear as legitimized. Thus, stronger peer support for adaptation engagement increases the likelihood that bureaucrats view adaptation as a multidimensional issue ('peer support hypothesis').

In respect of external factors, both access to funding and the degree to which knowledge about the impact of climate risks in an issue area is certain may shape the room for maneuver in global adaptation governance[4,6]. Signals from the external environment regarding the availability of adaptation funding and knowledge about how climate risks manifest in a bureaucrat's issue area likely influence their attitudes towards adaptation. This logic leads to two expectations. First, greater access to adaptation funding increases the likelihood that bureaucrats consider adaptation as a multidimensional issue ('adaptation funding hypothesis'). Second, greater knowledge certainty about climate risks increases the likelihood that bureaucrats view adaptation as a multidimensional issue ('knowledge certainty hypothesis').

To examine these hypotheses, the paper draws on an unprecedented survey of international bureaucrats in the area of adaptation. The survey was fielded among 61 international bureaucrats between March and April 2018, covering three international organizations. Three organizations that operate in a similar institutional environment under the auspices of the United Nations (UN) are selected: UN Environment, the UN's Refugee Agency (UNHCR), and the World Health Organization (WHO). This selection is advantageous in this current study, since they operate in different issue areas and have different organizational features––factors that might be associated with structures shaping issue frames. At the same time, all three are part of the UN system, which holds potentially confounding and unobserved institutional features somewhat constant.

RESULTS

Each of the surveyed international bureaucrats works in one of the three focal organizations. UN Environment was established in 1972 with a mandate in monitoring and coordinating environmental policy. UNHCR was founded in 1950 to protect refugees and has broadened its mandate to migration and forced displacement. The WHO was created in 1946 with a mandate to promote health, broadly understood as a state of physical, mental and social well-being. The WHO has been an early mover on adaptation in the 1990s, while UNHCR and UN Environment have stepped up their adaptation engagement only in the late 2000s. UNHCR has relatively low levels of adaptation engagement when compared to the other two organizations[4,6].

The survey was conducted as an online survey and yielded 22 completed responses from respondents in UN Environment, 21 in UNHCR, and 18 in the WHO. The survey covers bureaucrats who worked with climate risks in their respective organization at the time of the survey. This sampling strategy captures the views of those people working in international organizations who are potential norm entrepreneurs in adaptation governance (see 'Methods'). While a qualitative interview study could have been undertaken, previous literature on adaptation governance is mostly based on interviews[4,6,7]––with notable exceptions[48]. The standardized questionnaire therefore yields insights comparable across individuals, organizations, and issue areas.

The analysis is in two parts. First, survey responses are analyzed by using box plots, which are suitable for showing comparable patterns in survey data. Box plots illustrate a sample using the 25th, 50th and 75th percentiles—also known as the lower quartile, median and upper quartile—and the interquartile range, which covers the central 50% of the data[49]. Whenever possible, the results are illustrated by responses to the open-ended question at the end of the survey which asked respondents to add any issues related to climate risks that appeared important to them. Second, I test the hypotheses by analyzing several factors concomitantly in a series of regression models. This allows for providing evidence that is indicative of whether the assumptions underlying the hypotheses are valid, while controlling for alternative explanations. More information is provided in 'Methods' and the questionnaire as well as a numbered list of the study participants can be found in the 'SI Appendix'.

Frames of adaptation to climate risk

The analysis begins with a mapping of the issue frames through which international bureaucrats view adaptation to climate risks. To capture issue frames, I use the answers to the following survey question: "There is a lively global debate on climate risks. What is your view?" Respondents were asked to evaluate several items which varied the issue frame: "Some argue that climate change should be regarded as a *human security/state security/health/migration* issue" on a scale from strongly opposed (coded 1) to strongly in favor (coded 7). These frames are known to have been used discursively in global adaptation governance[6,23,24].

I will analyze these four measures both separately and jointly in an additive index. The assumption behind creating an additive index is that this index expresses the extent to which climate risks are simultaneously regarded through different issue frames. The internal reliability of the index dimensions has a Cronbach's alpha of 0.79, which indicates that the four dimensions consistently measure the frames through which climate risks are understood. This index ranges from 6 to 28, with the median respondent scoring quite high at 24.

Fig. 1 depicts the variation in the additive index based on the four issue frames. There is some variation in the extent to which respondents view climate risks through multiple issue frames. The surveyed climate experts in the WHO score higher on the index, with the exception of few outliers. By contrast, the responses of climate experts in UNHCR and UN Environment are more variegated, indicating a greater divergence in the extent to which climate risks are seen as a multidimensional issue.

Fig. 2 breaks down the index into its four component measures to better understand the variation in the index. The median climate expert in all three organizations views climate risks through a human security frame (Fig. 2a). State security (Fig. 2b), health (Fig. 2c), and migration (Fig. 2d) frames are more variegated among the international bureaucrats surveyed, especially in UNHCR and in UN Environment. For instance, across all three organizations, the median climate expert views climate risks through a health frame, but particularly in the WHO when compared to the other two organizations. Taken the evidence from all organizations together, this suggests that bureaucrats most commonly view climate risks through a human security frame.

Descriptive analysis of factors shaping cognitive frames

To understand why these climate frames vary, I will examine bureaucrats' perceptions of how peers within an organization perceive of adaptation governance, but also of resources available for adaptation to climate risks for the organization. Several survey items are used to capture perceptions of institutional constraints stemming from peer opinion on climate risks.

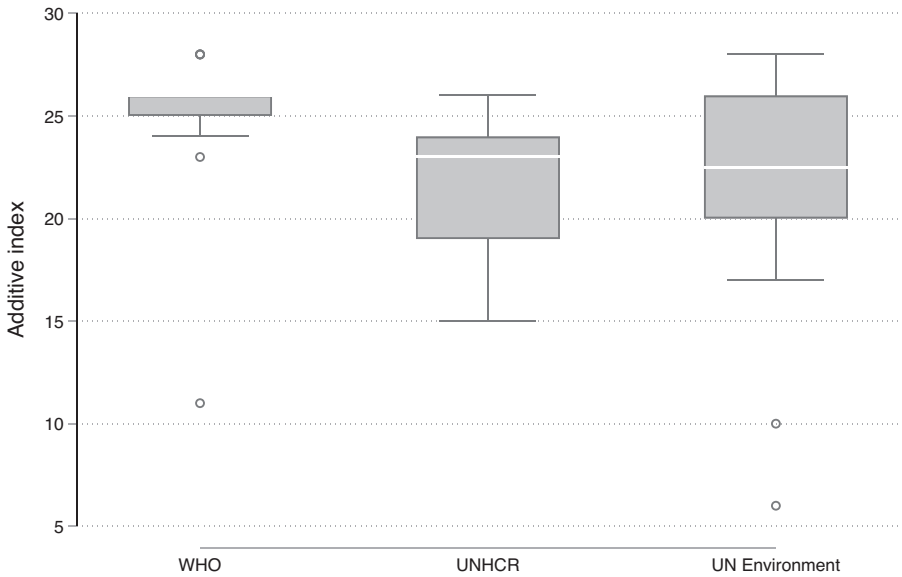

Fig. 1 Perceptions of climate risks as a multidimensional issue (additive index). Note: $N = 61$ (overall), $N = 18$ (WHO), $N = 21$ (UNHCR), $N = 22$ (UN Environment). Two-tailed *t*-tests suggest that the UNHCR and WHO measures differ from each other ($p < 0.003$; $N = 59$), as well as the UN Environment and WHO measures ($p < 0.044$; $N = 40$). In contrast, the measures for UN Environment and UNHCR do not significantly differ ($p < 0.753$; $N = 43$).

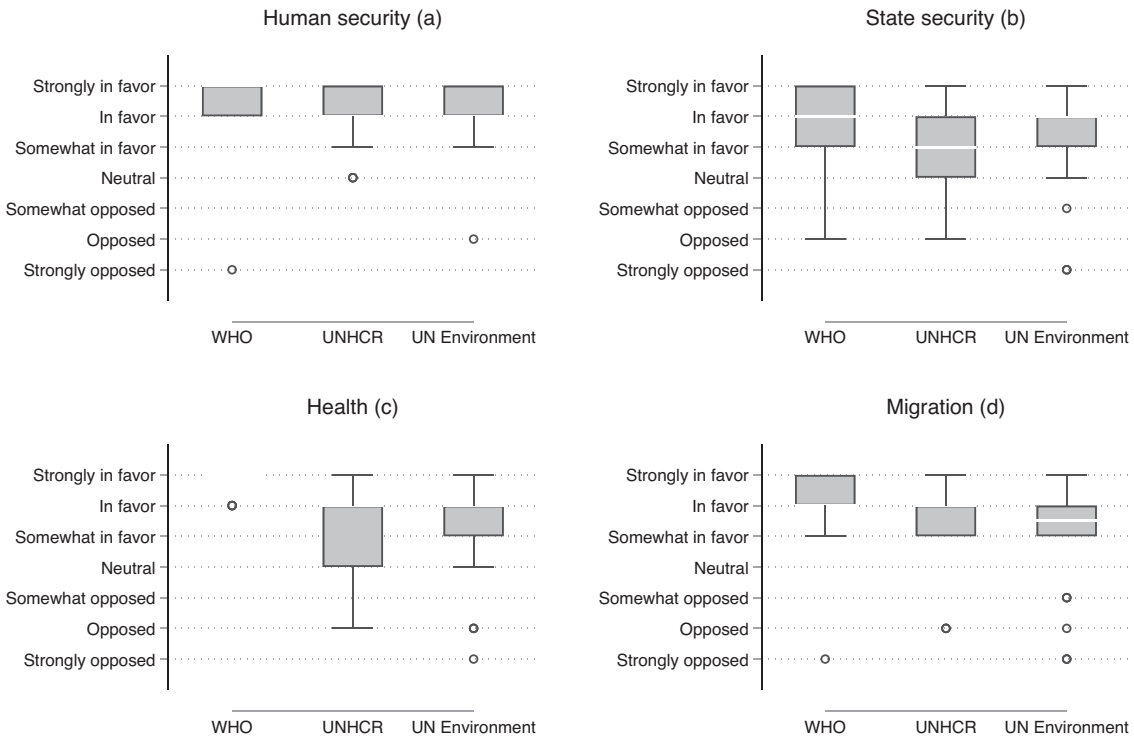

Fig. 2 Perceptions of climate risks (component measures of the additive index). Note: $N = 61$ (overall), $N = 18$ (WHO), $N = 21$ (UNHCR), $N = 22$ (UN Environment). Two-tailed *t*-tests suggest that most of these measures do not significantly differ from each other, with the exception of: the state security frame between UNHCR and WHO ($p < 0.036$; $N = 39$), the health frame between UNHCR and WHO ($p < 0.000$; $N = 39$) and between UNEP and WHO ($p < 0.001$; $N = 40$). The statistically insignificant results are reported in SI Appendix D1.

Specifically, I include perceptions of peer opinion on four key dimensions of adaptation governance[13,23,24]: governance in collaboration with other organizations, governance by addressing adaptation in reports, governance by using a larger budget for adaptation, and governance by working toward greater delegated authority to address adaptation. To capture these aspects, I use a survey question asking "In your opinion, how do policymakers in *UN Environment/UNHCR/the WHO* view the following issue?". The items are: "Policymakers in UN Environment oppose or favor collaboration with other intergovernmental organizations or UN bodies on climate risks."; "Policymakers in UN Environment oppose or favor having more power to deal with climate risks.";

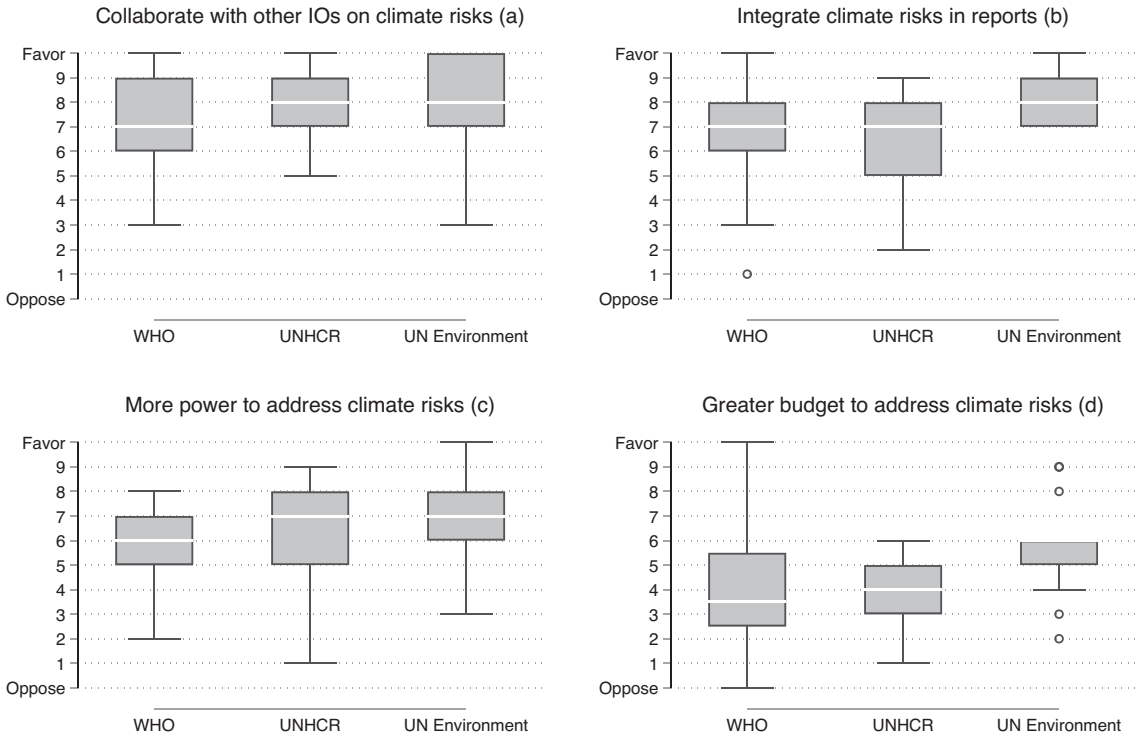

Fig. 3 Perceptions of internal institutional constraints. Note: Staff support for collaboration with other international organizations (IOs) on climate risks ($N = 59$), for more power to address climate risks ($N = 55$), for integrating climate risks in reports ($N = 55$), and for a greater budget to address climate issues ($N = 51$). Two-tailed *t*-tests suggest that most of these measures do not significantly differ from each other, with the exception of: the reports measure between UNEP and WHO ($p < 0.001$; $N = 36$) and between UNEP and UNHCR ($p < 0.004$; $N = 39$); and the budget measure between UNEP and UNHCR ($p < 0.005$; $N = 35$) and—albeit p is slightly larger than 0.05—between UNEP and WHO ($p < 0.053$; $N = 34$). The statistically insignificant results are reported in SI Appendix D2.

"Policymakers in UN environment oppose or favor the inclusion of climate risks in UN Environment reports."; and "Policymakers in UN Environment oppose or favor allocating a larger share of its budget to climate risks." These several items were to be evaluated on a quasi-continuous scale ranging from 0 ("oppose") to 10 ("favor").

Fig. 3 shows that the surveyed bureaucrats perceive other policy-makers in their respective organization to be moderately in favor of collaborating with other international organizations on climate risks (Fig. 3a). A similar picture arises from the item about perceived support for more power to deal with climate risks (Fig. 3c). Regarding the item about integration of climate risks in reports, the median respondent in UN Environment scores relatively high, whereas the median respondents in UNHCR and the WHO score lower (Fig. 3b).

The responses to the item about support from staff members for budgetary shares for climate-related activities are worth discussing in more detail (Fig. 3d). The perceived support for a greater budget for such activities is relatively low across all organizations when compared to the other items in Fig. 3. In UN Environment, the median score is again highest, when compared to the other two organizations. One respondent in WHO highlights "a major disconnect in WHO" between the total share of the global burden of disease that is attributable to climate risks, and the insignificant share of the WHO budget (3–4%) that is allocated to activities for protecting health from climate risks (open-ended question, WHO respondent 12). Indeed, the WHO estimates that 25% of total global deaths are caused by environmental risk factors, such as air, water and soil pollution, chemical exposures—and climate change[48]. Moreover, "[t]he number of people working on climate risks in WHO is extremely small in comparison to other health topics" (open-ended question, WHO 2). Another respondent emphasized that "more capacity should be built internally" in order to enable WHO "to start considering climate risks comprehensively and not in silos" (open-ended question, WHO 8).

Taken together, the findings from Fig. 3 suggest that the perceived peer support for addressing climate risks in reports and with existing budgets is highest in UN Environment when compared to the other two organizations. Yet, views of climate risk as a multidimensional political issue are least common in UN Environment when compared to UNHCR and WHO. Rather, they are most common in the WHO (Fig. 1). This indicates that the peer support hypothesis does not bear out in the results, which is underlined by the regression analysis presented in the ensuing section.

To capture adaptation funding and knowledge certainty, I rely on the responses to two survey questions. The first question is "In your opinion, to what degree are external donors willing to fund climate risk-related projects in *UN Environment/UNHCR/the WHO*?", to be answered on a quasi-continuous scale ranging from 0 ("none at all") to 10 ("to a very high degree"). The second question is "How certain do you perceive knowledge about climate risks to be in the context of your own work?", with a similar scale ranging from 0 ("completely uncertain") to 10 ("completely certain").

Fig. 4 illustrates the variation in these measures. The median respondent in the three organizations scores a six on the 11-point scale on the question about donor willingness to fund climate risk projects in their organization. While this indicates that donor willingness is perceived to be moderately high, responses are far from unanimous, as suggested by the interquartile ranges (Fig. 4a).

Knowledge certainty appears to be particularly high in the WHO, in which the median respondent thinks knowledge about how climate risks affect health is completely certain (Fig. 4b). The interquartile range is also lowest in the WHO. In UN Environment

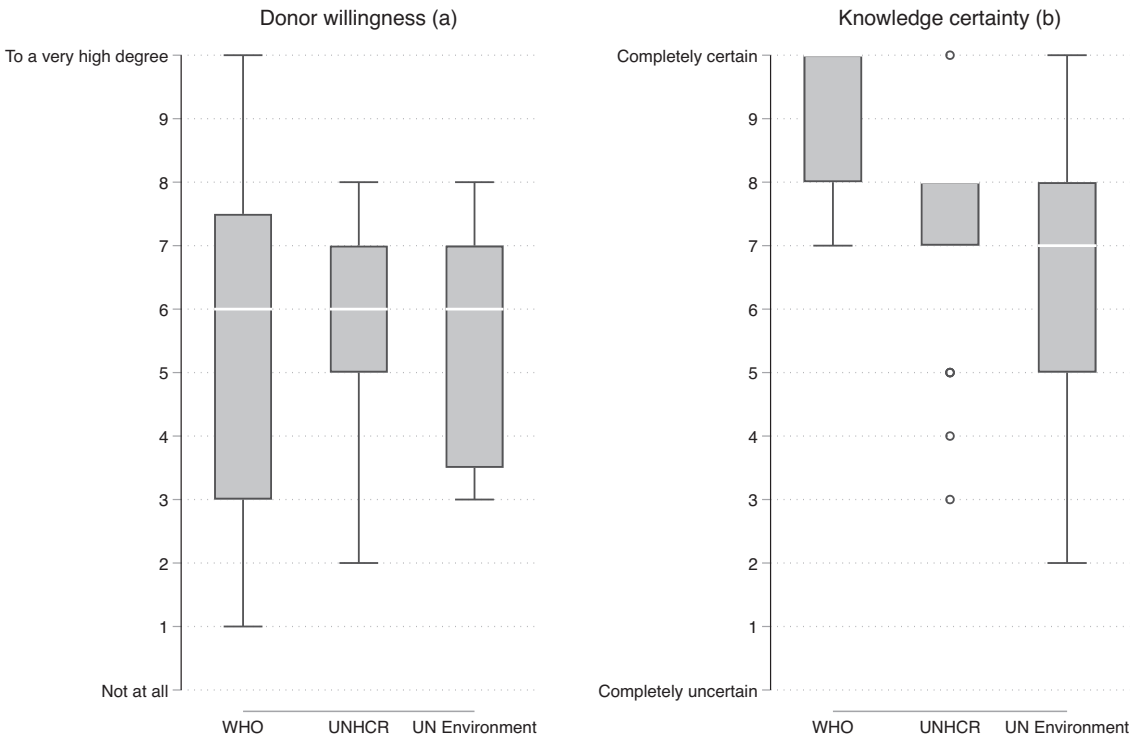

Fig. 4 Perceptions of external institutional constraints. Note: Donor willingness to fund climate risk-related projects: $N = 55$ (overall), $N = 16$ (WHO), $N = 19$ (UNHCR), $N = 20$ (UN Environment). Knowledge certainty on climate in respondent's issue area: Note: $N = 59$ (overall), $N = 18$ (WHO), $N = 19$ (UNHCR), $N = 22$ (UN Environment). Two-tailed *t*-tests suggest that most of these measures do not significantly differ from each other, with the exception of the knowledge measure between UNHCR and WHO ($p < 0.001$; $N = 37$) and between UNEP and WHO ($p < 0.000$; $N = 40$). The statistically insignificant results are reported in SI Appendix D3.

and in UNHCR, knowledge certainty is comparatively lower. To illustrate, one respondent added: "Personally I would like to see more on the evidence base for why UNHCR should be more engaged, as currently it feels like we are over-stretched in terms of crises and unresolved displacement and we need to focus more on where we can add real value rather than chasing after more initiatives, populations at risk, and problems" (UNHCR 14). Moreover, the certainty of the knowledge is an issue: "Climate risks are important, but—in my opinion—they're most relevant in terms of future projections. It's hard to currently ascribe major incidents to anthropogenic climate change" (open-ended question, UNEP 7).

In all, the findings from Fig. 4 indicate that knowledge certainty might coincide with the notable extent to which climate experts in the WHO perceive climate risks as a multidimensional issue. The evidence is thus in line with the knowledge certainty hypothesis, but does not corroborate the adaptation funding hypothesis. The regression analysis below underpins this interpretation.

Regression analysis of cognitive frames

The descriptive analysis has indicated that it is worth exploring further whether knowledge certainty is associated with views through the multidimensional frame, while controlling for alternative explanations. Accordingly, I regress the multi-issue frame index on knowledge certainty, while also controlling for a number of individual-level factors, which previous literature has included when examining variation in elite opinion. These factors are particularly age and gender[33,35], which are close to normally distributed.

Further, I control for the level of seniority and the frequency of dealing with climate risks in their work. Seniority and experience with climate risks can affect the degree to which respondents view climate risks as a multi-issue problem. Respondents also spread all levels of seniority: top-level management (3.3%), mid-level management (73.3%), lower-level management (3.3%), consultants and technical staff (16.7%), and interns (3.3%). The surveyed persons worked with climate risks daily (45.0%), weekly (16.7%), monthly (10.0%), several times a year (23.3%) or once a year or less (3.0%). Economic ideology is measured on a quasicontinuous scale from 0 ("pure state") to 10 ("pure market") and ranges from 2 to 10, with the median respondent scoring 5. Green-traditionalist ideology is measured on a scale from 0 ("green/libertarian" to 10 ("traditionalist") and ranges from 0 to 8, with the median respondent scoring 2[35]. As climate change is part of ideological debates, particularly at the domestic level, ideology might matter for bureaucrats' views of climate risks (see SI Appendix B for descriptive statistics for each organization).

The results are shown in Table 1. The models include variables incrementally to give an impression of the robustness of the results for the knowledge variable. This is particularly important given that these data are limited in sample size and thus the impact of random error might be higher. In line with statistical convention only significant associations at $p < 0.05$ are interpreted. The knowledge hypothesis predicts a positive relationship between knowledge certainty and multi-issue frames, which is supported by the evidence. The coefficient of knowledge is statistically significant at the 5% level and positive throughout, suggesting that knowledge certainty is positively associated with an appraisal of the multidimensionality of the climate issue.

This result holds even if controlling for the level of seniority, frequency of dealing with climate risks in their work, age, and gender in Model 2 and in addition, economic and green ideology in Model 3. None of these control factors appear to consistently matter. Age is statistically significant and negative in Model 3,

Table 1. Regression results for multi-issue frames.

	(1)	(2)	(3)
Knowledge certainty	0.64[a]	0.63[b]	0.86[a]
	(0.28)	(0.33)	(0.35)
Seniority		−0.28	0.55
		(0.79)	(0.97)
Frequency dealing with climate		0.21	0.51
		(0.47)	(0.52)
Age		−1.05	−2.30[c]
		(0.69)	(0.78)
Gender		−1.23	−1.03
		(1.42)	(1.51)
Economic state-market ideology			−0.21
			(0.41)
Green-traditionalist ideology			0.20
			(0.32)
Constant	17.84[c]	21.59[c]	19.67[c]
	(2.17)	(3.64)	(4.68)
N	59	58	46
adj. R^2	0.07	0.06	0.23

Note: Results from ordinary least squares regression analysis using the multi-issue frame index (see Fig. 1) as a dependent variable. Standard errors in parentheses. Significance levels:
[a] $p < 0.05$
[b] $p < 0.10$
[c] $p < 0.01$

indicating that younger bureaucrats might be more likely to view climate adaptation as a multidimensional issue. It is unclear if this indicates a generational effect or if it is due to other causes, such as self-selection of younger people endorsing an encompassing climate adaptation agenda into international organizations. However, this result should be interpreted with caution as the coefficient of age is statistically insignificant in Model 2.

Other factors are included in the robustness checks for the sake of parsimonious models in the main analysis. These robustness checks include all measures presented in Fig. 3, both separately and in a concomitant model, which does not change these results. None of these additional measures appear to matter (Appendix E1).

In sum, the results suggest that knowledge certainty fosters the degree to which bureaucrats view climate risk as a multidimensional issue. In other words, cognitive multi-issue frames might be more prevalent among those bureaucrats who perceive knowledge certainty about climate risks in their issue area to be high. This underlines the importance of improving the knowledge basis regarding adaptation to climate risks in international bureaucracies.

DISCUSSION

To harness the knowledge and financial resources needed for just and effective adaptation, policymakers need to address adaptation challenges at the right scales, which includes the international scale[22,23]. Moreover, we need effective leadership to find adequate adaptation solutions[50], and often bureaucracies are themselves portrayed as barriers to such leadership in adaptation[16]. In light of this, this article has examined an understudied issue, namely, the cognitive frames through which international bureaucrats perceive climate risks, as well as the wider institutional structures within which such frames emerge.

The key results are twofold. First, when addressing climate risks, most surveyed bureaucrats across the three international organizations are found to view climate risks through multiple frames. However, there is variation between organizations, as multi-issue frames are more common among climate experts in WHO than in the other two organizations. For adaptation governance research, the findings underline that adaptation is characterized by epistemic ambiguity[5–7,23] even among climate experts in the surveyed international organizations.

Second, the results indicate that the more international bureaucrats perceive knowledge on climate risks to be certain in their issue area, the more they view climate risks through multi-issue frames, which corroborates the knowledge certainty hypothesis. In contrast, peer opinion and external funding for adaptation do not appear to matter for the prevalence of multi-issue frames, which is not in line with expectations. To illustrate, although WHO was an early mover that already in the 1990s started to integrate adaptation into their mandate in health[6,13], funding has been a challenge. WHO—in contrast to UN Environment—is not an accredited agency to the Green Climate Fund (GCF) and the Global Environmental Facility (GEF)[51], which is why the WHO has sought bilateral funding and partnerships with accredited organizations[6,52,53].

These indicative findings speak to international bureaucracy research. In theories of international bureaucracy, it is debated what drives epistemic certainty and with what consequences[15,16,43,46]. This present study invites future research considering knowledge certainty as a potential driver of bureaucrats' cognitive frames in the area of climate risks. The public administration literatures on international bureaucrats[36,37] and on adaptation governance[16,54] have an important role to play. In particular, theories of administrative structures and organizational cultures[43,44] offer cues for explaining *why* knowledge certainty may foster multi-issue frames. This study has provided an inquiry into bureaucrat attitudes towards adaptation, but the results are only tentative regarding differences across issue areas and organizations, pointing to the need for future exploration of these factors.

A puzzle emerging from the analysis pertains to the role of age for attitudes towards adaptation. Although the evidence for age is inconclusive, it indicates that younger bureaucrats might be more likely to view adaptation as a multidimensional issue. A knock-on question for future research is whether there are cohort effects or self-selection dynamics shaping bureaucrat attitudes towards adaptation. This question could be studied in an extended sample of international governance arrangements engaged in adaptation, moving beyond the three UN agencies studied here, to increase variation in administrative structures and organizational cultures.

To conclude, bureaucrat attitudes might change over time. Since the survey has been undertaken in 2018, there might have been a shift in attitudes towards adaptation. However, no basis exists as yet for longitudinal analysis. For example, changing patterns of geopolitics and nonstate actor participation in global governance have affected the performance of international organizations[55–58], which in turn could have affected perceptions of adaptation as a political issue. The results of this article could thus be usefully extended to other moments in time, elucidating how and why bureaucrats view adaptation to climate risks.

METHODS

Survey recruitment

The survey covers bureaucrats who worked with climate risks in their respective organization during the field phase of the survey (March-April 2018), to capture the views of those bureaucrats who are potential norm entrepreneurs in adaptation policy. The survey was fielded in three steps. First, in cooperation with the leadership

of the three organizations, the in-house climate experts for whom the survey appeared relevant were identified. Second, these experts were contacted by email with information about the aim of the survey and the link to the online survey. The aim was to elicit what international bureaucrats think about addressing climate risks for nature or societies in their respective organization. Third, the questionnaire could be filled in by the respondents themselves on separate screens that opened after clicking on the link.

As a result, 61 of 80 contacted climate experts completed the questionnaire. More specifically, the questionnaire was completed by 19 out of 32 contacted climate experts in the WHO, 22 out of 23 contacted experts in UN Environment, and 25 out of 36 experts in UNHCR. Thus, the survey covers a nearly even number of respondents across the organizations, amounting to 66 responses and 61 completed responses in total. The number of respondents used in the paper can be lower due to item non-response.

Questionnaire design

The main purpose of the survey was to assess the views of international bureaucrats on engaging in the governance of adaptation to climate risks in the organization they work in. To this end, a questionnaire of about 10 min in length was devised. The questions either had a "don't know" option or they could be skipped, in order to reduce the risk of capturing non-attitudes or losing respondents to potentially sensitive questions. The full questionnaire is provided in the 'Supplementary Information'. Given the norm struggles and lack of conceptual integration in contemporary global adaptation governance[11], the email of contact and first page of the survey did not define adaptation or climate risks in order not to prime respondents inappropriately. The full questionnaire can be accessed in SI Appendix A.

Ethical compliance

The paper complies with all relevant ethical regulations and specifically with the Declaration of Helsinki, adopted by the 18th WMA General Assembly, Helsinki, Finland, June 1964, and the European General Data Protection Regulation (GDPR). Informed consent was obtained from all research participants in the form of written consent of the participating organizations.

Reporting summary

Further information on research design is available in the Nature Research Reporting Summary linked to this article.

DATA AVAILABILITY

The datasets analysed during the current study are available in the Harvard Dataverse repository at https://doi.org/10.7910/DVN/X6DSGT.

Received: 8 February 2023; Accepted: 12 October 2023;
Published online: 19 December 2023

REFERENCES

1. World Meteorological Organization. *WMO Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes (1970–2019)*, WMO-No. 1267. https://library.wmo.int/doc_num.php?explnum_id=10989, p. 7. (2021).
2. Ara Begum, R. et al. Point of departure and key concepts. In: *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (eds Pörtner, H.-O. et al.) p. 144 and p. 134. (Cambridge University Press, Cambridge, UK and New York, NY, USA, 2022).
3. Persson, Å. & Dzebo, A. Special issue: exploring global and transnational governance of climate change adaptation. *Int. Environ. Agreem.* **19**, 357–367 (2019).
4. Hall, N. Money or the mandate? Why international organizations are engaging with the climate change regime. *Glob. Environ. Polit.* **15**, 79–96 (2015).
5. Lesnikowski, A. et al. What does the Paris Agreement mean for adaptation? *Clim. Policy* **17**, 825–831 (2017).
6. Dellmuth, L., Gustafsson, M.-T. & Kural, E. Global adaptation governance: explaining the governance responses of international organizations to new issue linkages. *Environ. Sci. Pol.* **114**, 204–214 (2019).
7. Hall, N. What is adaptation to climate change? Epistemic ambiguity in the climate finance system. *Int. Environ. Agreem.* **17**, 37–53 (2017).
8. Ziervogel, G. & Ericksen, P. J. Adapting to climate change to sustain food security. *WIREs Clim. Change* **1**, 525–540 (2010).
9. Schipper, E. L. F. Maladaptation: when adaptation to climate change goes very wrong. *One Earth* **3**, 409–414 (2020).
10. Rocklöv, J. & Dubrow, R. Climate change: an enduring challenge for vector-borne disease prevention and control. *Nat. Immunol.* **21**, 479–483 (2020).
11. Berrang-Ford, L. et al. A systematic global stocktake of evidence on human adaptation to climate change. *Nat. Clim. Chang.* **11**, 989–1000 (2021).
12. Dellmuth, L. & Gustafsson, M.-T. Global adaptation governance: how intergovernmental organizations mainstream climate change adaptation. *Clim. Policy* **21**, 868–833 (2021).
13. Kural, E., Dellmuth, L. & Gustafsson, M.-T. International organizations and climate change adaptation: a new dataset for the social scientific study of adaptation, 1990–2017. *PLoS ONE* **16**, e0257101 (2021).
14. Jordan, A., Huitema, D. & van Asselt, H. Climate change policy in the European Union: an introduction. In: *Climate Change Policy in the European Union: Confronting the Dilemmas of Mitigation and Adaptation?* (eds Jordan, A., Huitema, D., van Asselt, H., Rayner, T., & Berkhout, F.) 3–26. (Cambridge University Press, Cambridge, 2010). https://doi.org/10.1017/CBO9781139042772.003, pp. 4–5.
15. Tosun, J. & Peters, B. G. Intergovernmental organizations' normative commitments to policy integration: the dominance of environmental goals. *Environ. Sci. Pol.* **82**, 90–99 (2018).
16. Biesbroek, R., Peters, B. G. & Tosun, J. Public bureaucracy and climate change adaptation. *Rev. Policy Res.* **35**, 776–791 (2018).
17. Milhorance, C., Sabourin, E., Chechi, L. & Mendes, P. The politics of climate change adaptation in Brazil: framings and policy outcomes for the rural sector. *Environ. Pol.* **31**, 183–204 (2022).
18. Fairbrother, M. Public opinion about climate policies: a review and call for more studies of what people want. *PLOS Clim.* **1**, e0000030 (2022).
19. Eriksen, S. H., Nightingale, A. J. & Eakin, H. Reframing adaptation: the political nature of climate change adaptation. *Glob. Environ. Chang.* **35**, 523–533 (2015).
20. Chan, S. & Amling, W. Does orchestration in the Global Climate Action Agenda effectively prioritize and mobilize transnational climate adaptation action? *Int. Environ. Agreem.* **19**, 429–446 (2019).
21. Biermann, F. & Boas, I. Global adaptation governance: setting the stage. In: *Global Climate Governance beyond 2012: Architecture, Agency and Adaptation* (eds Biermann, F., Pattberg, F. & Zelli, F.) pp. 223–234 (Cambridge University Press, New York, 2010).
22. Benzie, M. & Persson, Å. Governing borderless climate risks: moving beyond the territorial framing of adaptation. *Int. Environ. Agreem.* **19**, 369–393 (2019).
23. Persson, Å. Global adaptation governance: an emerging but contested domain. *WIREs Clim. Change* **10**, e618 (2019).
24. Hall, N. *Displacement, Development, and Climate Change: International Organizations Moving Beyond their Mandates*, Routledge (2016).
25. North, M. A. et al. Science for implementation: the roles, experiences, and perceptions of practitioners involved in the Intergovernmental Panel on Climate Change. *Clim. Action* **1**, 25 (2022).
26. Biermann, F. & Siebenhüner, B. *Managers of Global Change: The Influence of International Environmental Bureaucracies*. (MIT Press, Cambridge, 2009).
27. Ege, J. What International Bureaucrats (Really) Want. *Glob. Gov.* **26**, 577–600 (2020).
28. Busch, O. & Liese, A. The Authority of International Public Administrations, In *International Bureaucracy Challenges and Lessons for Public Administration Research* (eds Bauer, M. W., Knill, C. & Eckhard, S.), pp. 97–122. (Springer, Heidelberg, 2017).
29. Biesbroek, G. R. et al. Europe adapts to climate change: comparing national adaptation strategies. *Glob. Environ. Change* **20**, 440–450 (2010).
30. Heinzel, M. International bureaucrats and organizational performance. Country-specific knowledge and sectoral knowledge in World Bank projects, *Int. Stud. Q.* https://doi.org/10.1093/isq/sqac013 (2022).
31. Eckhard, S. & Ege, J. International bureaucracies and their influence on policy-making: a review of empirical evidence. *J. Eur. Pub. Policy* **23**, 960–978 (2016).
32. Scholte, J. A., Verhaegen, S. & Tallberg, J. Elite attitudes and the future of global governance. *Int. Aff.* **97**, 861–886 (2021).
33. Dellmuth, L., Scholte, J. A., Tallberg, J. & Verhaegen, S. *Citizens, Elites, and the Legitimacy of Global Governance*. (Oxford University Press, Oxford, 2022).

34. Hjerpe, M. & Nasiritousi, N. Views on alternative forums for effectively tackling climate change. *Nat. Clim. Change* **5**, 864–867 (2015).
35. Hooghe, L. Several roads lead to international norms, but few via international socialization: a case study of the European Commission. *Int. Org.* **59**, 861–898 (2005).
36. Bauer, M. W. Tolerant, if personal goals remain unharmed: explaining supranational bureaucrats' attitudes to organizational change. *Governance* **5**, 485–510 (2012).
37. Mele, V., Anderfuhren-Biget, S. & Varone, F. Conflicts of interest in international organizations: evidence from two United Nations humanitarian agencies. *Public Admin.* **94**, 490–508 (2016).
38. Eckhard, S. & Parizek, M. Policy implementation by international organizations: a comparative analysis of strengths and weaknesses of national and international staff. *J. Comp. Policy Anal.* **24**, 254–270 (2022).
39. Lenz, T. Frame diffusion and institutional choice in regional economic cooperation. *Int. Theory* **10**, 31–70 (2018).
40. Campbell, J. L. Institutional analysis and the role of ideas in political economy. *Theory Soc.* **27**, 377–409 (1998).
41. Goffman, E. *Frame Analysis: An Essay on the Organization of Experience* (Harvard University Press, Cambridge, 1974).
42. Druckman, J. N. What's it all about? Framing in political science. In: (ed Keren G). *Perspectives on Framing* (Psychology Press, New York, 2011), pp. 279–301.
43. Barnett, M. N. & Finnemore, M. The politics, power, and pathologies of international organizations. *Int. Org.* **53**, 699–732 (1999).
44. Knill, C., & Tosun, J. Policy making. In: (ed Caramani, D.), *Comparative Politics*. (Oxford University Press, Oxford, 2008), pp. 495–519.
45. Meyer, J. W. & Rowan, B. Institutionalized organizations: formal structure as myth and ceremony. *Am. J. Sociol.* **83**, 340–363 (1977).
46. Tallberg, J., Lundgren, M., Sommerer, T. & Squatrito, T. Why international organizations commit to liberal norms. *Int. Stud. Quart.* **64**, 626–640 (2020).
47. Hall, N. & Persson, Å. Global climate adaptation governance: why is it not legally binding? *Eur. J. Int. Relat.* **24**, 540–566 (2018).
48. Bäckstrand, K., Kuyper, J. W. & Nasiritousi, N. From collaboration to contestation? Perceptions of legitimacy and effectiveness in post-Paris climate governance. *Earth Syst. Gov.* **9**, 100115 (2021).
49. Krzywinski, M. & Altman, N. Visualizing samples with box plots. *Nat. Methods* **11**, 119–120 (2014).
50. Meijerink, S. & Stiller, S. What kind of leadership do we need for climate adaptation? A framework for analyzing leadership objectives, functions, and tasks in climate change adaptation. *Environ. Plann. C* **31**, 240–256 (2013).
51. Graham, E. R. & Thompson, A. Efficient orchestration? The global environment facility in the governance of climate adaptation. In: *International Organizations as Orchestrators* (eds Snidal, D., Zangl, B., Genschel, P. & Abbott, K. W.), pp. 114–138. (Cambridge University Press, Cambridge, 2015).
52. UNDP. *Issue brief—planetary health. June, 2017*. New York. https://www.undp.org/content/undp/en/home/librarypage/hiv-aids/issue-brief---planetary-health.html (2017).
53. Clark, H. et al. A future for the world's children? A WHO–UNICEF–Lancet commission. *The Lancet.* **395**, 605–658 (2020).
54. Biesbroek, G. R. et al. On the nature of barriers to climate change adaptation. *Reg. Environ. Change* **13**, 1119–1129 (2013).
55. Chan, S. et al. Promises and risks of nonstate action in climate and sustainability governance. *WIREs Clim. Change.* **10**, e572 (2019).
56. Chan, S. et al. Assessing the effectiveness of orchestrated climate action from five years of summits. *Nat. Clim. Chang.* **12**, 628–633 (2022).
57. Bakaki, Z. The impact of climate summits. *Nat. Clim. Chang.* **12**, 611–612 (2022).
58. Sommerer, T., Squatrito, T. & Tallberg, J. Decision-making in international organizations: institutional design and performance. *Rev. Int. Organ.* **17**, 815–845 (2022).

ACKNOWLEDGEMENTS

This publication has been supported by the Glocalizing Climate Governance (GlocalClim) project funded by Formas under grant number 2018-01705, and by MISTRA GEOPOLITICS, which is funded by MISTRA—the Swedish Foundation for Strategic Environmental Research. The survey analyzed in this paper was co-designed and implemented by Lisa Dellmuth and Maria-Therese Gustafsson at Stockholm University. The researchers are grateful to the study participants and to the leadership of United Nations Environment, of the United Nations High Commissioner for Refugees, and of the World Health Organization for facilitating the recruitment of survey participants.

AUTHOR CONTRIBUTIONS

The author acquired the research funding for the article, conceptualized the research, collected and analyzed the data, and wrote the article.

FUNDING

Open access funding provided by Stockholm University.

COMPETING INTERESTS

The author declares no competing interests.

ADDITIONAL INFORMATION

Supplementary information The online version contains supplementary material available at https://doi.org/10.1038/s44168-023-00073-2.

Correspondence and requests for materials should be addressed to Lisa Dellmuth.

Reprints and permission information is available at http://www.nature.com/reprints

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.