

How science bolstered a key European climate-change case

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A group of older women in Switzerland has taken the government to court over its inaction on climate change. Our experience of preparing evidence for the case offers six lessons for researchers.

This year, more than 2,000 Swiss women over the age of 64 are waging a legal battle at the European Court of Human Rights in Strasbourg, France. Called Senior Women for Climate Protection Switzerland (KlimaSeniorinnen Schweiz), the association is suing the Swiss government in Europe's highest human-rights court for not doing enough to combat climate change and to protect their health from related heat risks.

It is a landmark case (see go.nature.com/3j8tsd2) and its success hinges largely on the scientific evidence. A ruling is expected at the end of this year at the earliest. Given the high stakes, we decided to contribute as a group of interested and concerned academic specialists at the University of Bern, Switzerland. We represent fields including climate, health, social and political sciences; economics; ethics; Swiss constitutional and administrative law; and human-rights and public international law. We supplied independent scientific evidence and legal advice to the court in the form of an *amicus curiae* ('friends of the court') brief. We are one of more than 20 groups to do so in this case.

The KlimaSeniorinnen argue that their rights to life and to private and family life are threatened by global and regional warming caused by human activities. Older people are more likely to die from the effects of excessive heat, and women are more at risk than are men^{1,2}. The Swiss government bears responsibility, the women contend, because it has consistently failed to substantially reduce its greenhouse-gas emissions to lower these risks.

Specifically, the association asked the court to order Switzerland "to put in place all necessary measures" to do its fair share "to prevent a global temperature increase of more than 1.5 °C above pre-industrial levels" by adopting



People at Lake Geneva in Switzerland during a 2018 heatwave that affected much of Europe.

"the legislative and administrative framework necessary to effectively protect the Applicants' right to life and family and private life".

This case, along with two other leading cases pending in the court (see go.nature.com/44wvvt), will eventually clarify whether, and to what extent, the 46 states under the court's jurisdiction are legally obliged to mitigate climate change to protect people against harms to health.

"Whether the KlimaSeniorinnen case is won or lost has wide ramifications."

Legal cases involving climate change are on the rise. As of May 2023, around 1,550 cases have been litigated since the Paris climate agreement in 2015, compared with only 800 in the previous 28 years (1986–2014). In nearly 55% of all cases in which the courts have made an interim or final decision, the outcome has been favourable to climate action³. Since 2019, higher courts in the Netherlands, Ireland, France and

Germany have ordered their governments to strengthen climate mitigation efforts on the basis of human-rights obligations. Whether the KlimaSeniorinnen case is won or lost has wide ramifications: it will set the course for future law on climate change across Europe.

Nonetheless, many climate lawsuits have failed, often owing to unsatisfactory scientific evidence or inadequate judicial treatment of it⁴. The KlimaSeniorinnen case bears a similar risk. It stems from litigation begun in 2016, which was dismissed by the Swiss Federal Administrative Court in 2018 and the Swiss Federal Supreme Court in 2020. Those judges held that the older women were "not particularly affected", that this was a political rather than a legal issue, and that there was "still time" to combat dangerous climate change. Those judgments were widely criticized at the time for being disengaged with science⁵. Since then, the evidence base around heatwaves and other climate impacts has strengthened.

Admittedly, legal judgments related to climate change are difficult to make because the underlying science is complex and spans many disciplines⁶. For example, to gauge climate-related health risks, one must understand

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how climate processes unfold and how heat and other stressors affect health. Similarly, probabilities drawn from scientific reports by the Intergovernmental Panel on Climate Change need to be translated into legal language. As last month's victory in the *Held v. Montana* children's climate lawsuit underlines, science and its connection to the law play a crucial part in securing successes in climate litigation.

With the landmark Swiss case pending, we decided to assist the court by assessing the risks for older women in Switzerland and translating those risks into legal language. Here we share our experiences and highlight six lessons.

Decide where to focus your intervention

In April 2022, the European Court of Human Rights gave the *KlimaSeniorinnen* case priority status and referred it to its Grand Chamber. This happens when a case raises a serious legal question – here, to what extent, if at all, is climate change a human-rights issue under the European Convention on Human Rights? This opened a window for third parties to file interventions. In July 2022, we sent such a request to the court, which it granted in October. This gave us just six weeks to assemble our evidence, which we submitted in December 2022.

The tight deadline was challenging. We had to find a distinctive voice as a group of experts in different fields, and agree on methodology. For example, we had to decide how far back we would go to assess Switzerland's climate policies and performance; we settled on a baseline year of 1990. Looking at recent years underlines the urgency of stricter climate policies, whereas looking further back exposes structural failings more easily. Similarly, we had to decide to what extent we would consider climate action in neighbouring states, which we did selectively to put Swiss actions in a wider context.

We first chose to identify interdisciplinary gaps relevant to the case, and then picked ones that matched our expertise. A plus point for us was that our group included a leading expert on the health impacts of climate change, who has expertise specific to Switzerland (A.M.V.-C.).

We also decided to draw together legal evidence to highlight why the rights to life and to a private and family life (Articles 2 and 8 of the convention) do impose a duty on national authorities to take measures to protect citizens against threats to these rights in environmental and climate matters. A state violates this duty when it should have known or ought to have known of a real and immediate risk to persons in its jurisdiction. Our job was then to identify what those risks were.

Target evidence specific to the case

It is important to focus only on details that are directly relevant to the case at hand, in our experience. For instance, rather than citing general facts about heat stress from global studies, we



KlimaSeniorinnen members at the European Court of Human Rights in Strasbourg, France.

narrowed our evidence to studies in Switzerland. We also tackled the reasoning Swiss courts had previously used to dismiss the case.

For instance, we pointed to analyses showing that heat-related mortality in Switzerland disproportionately falls on older people – between 1969 and 2017, nearly 70% of such deaths occurred in people over 80 years old⁷. And we flagged epidemiological studies from the past five years demonstrating that Swiss women are at greater risk of heat mortality than are men (see, for example, ref. 8). We then attributed the role of anthropogenic climate change in such deaths. The summer of 2022 was the second-warmest in Switzerland in recent times, after that of 2003. Between June and August 2022, 60% (370 people) of all heat-related deaths in the country were a result of human-caused climate change – and more than half (55%) of those were in women older than 65 years⁹ (see 'Swiss heat-related deaths in 2022').

Set climate targets in wider context

To assess whether Switzerland's climate measures are sufficient to protect against these threats, we merged analyses from climate and political sciences. The country has signed and ratified the Paris agreement, joined the Glasgow Climate Pact to strengthen its mitigation commitments and put in place emissions-reduction targets for 2030 (a 50% cut from 1990 levels) and 2050 (net zero). Despite these actions, we showed how its current path to reducing emissions is grimly inadequate.

For example, Switzerland has missed all of its own targets. And scientific projections suggest that they were too weak to be in line with the (now outdated) 2 °C target set in 2007 anyway. For instance, the nation's initial target

to cut emissions by 20% by 2020 (relative to 1990 levels) should have been between 25% and 40% (ref. 10); in the end, 19% was achieved, but only because of a warm winter in 2019–20 and a large reduction in emissions from traffic during the COVID-19 pandemic restrictions. The 2030 target should have been a cut of at least 63%, not half (see go.nature.com/480kbf). And it should have focused entirely on domestic emissions reduction. Instead, Switzerland relies on the actions of other nations for one-third of its planned emissions cuts, to compensate for sectors at home that are hard to abate¹¹. Yet only one planned project has been completed: the installation of 2,000 fuel-efficient cookers in Peru (see go.nature.com/3pswnzm).

Swiss plans fall short of those of comparable nations. For example, the UK policy is to lower emissions at a rate consistent with keeping global warming within 1.5 °C of pre-industrial levels, with commitments to reduce emissions by 68% by 2030 (compared to 1990 levels) exclusively through domestic reductions. Hard as it might be to achieve this target (see go.nature.com/3pf35j9), getting the aims and pace right in the first place is crucial for effective climate policy.

By examining previous case law of the European Court of Human Rights, we also countered another claim of the Swiss government, namely that its climate policy is a national matter and beyond the reach of the Strasbourg court. We showed that a state is certainly free to set up its own climate law and policy – as long as it is compatible with the convention rights. To assess this, the court will have to review whether Switzerland's climate policy is indeed aligned with or is threatening its human-rights obligations in the context of climate change

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– otherwise, climate matters are at risk of becoming a ‘human-rights-free zone’.

Observe scientific integrity while recognizing values

Scientists contributing third-party evidence must maintain their ideals of neutrality, integrity and reliability, but they should also be realistic and aware that briefs might be used in court in ways that could politicize the contents¹². For example, describing how Switzerland has missed its climate targets in the past could be seen by some as taking sides.

Interveners must recognize that assessments of evidence are not about finding absolute truths, but are informed by ethical and political views and values. It pays to be open about these. For example, questions about greenhouse-gas budgets or what sectors can be expected to contribute to emissions reductions assume the rule of law, and that authorities and others will act fairly. For this case, we emphasized values and rights enshrined in the Swiss constitution – environmental protection, the precautionary principle and the state’s duties to protect.

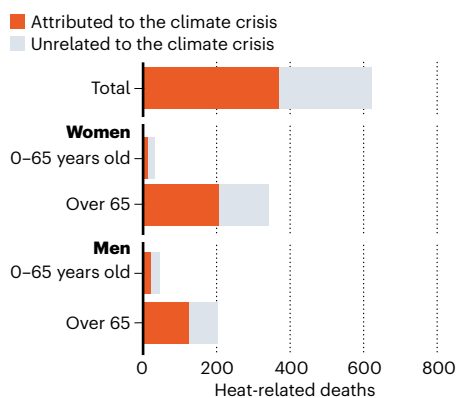
Academics can gain trust by being transparent about these values. They can demonstrate impartiality by giving alternatives equal consideration, such as by outlining a range of outcomes depending on emissions scenarios. And they can display scientific rigour, for example, by qualifying statements with probabilities.

Consider the wider reach of the intervention

Messages from third-party interventions spread beyond a particular case. They might have a lasting influence on other judgments – either by altering the outcome of one case or by informing precedents for others. They increase the legitimacy of proceedings by infusing them with diverse views, such as public interests or minority opinions that litigating parties might not include. And they make complex scientific information accessible, clear and manageable for both judges and the wider public to discuss.

SWISS HEAT-RELATED DEATHS IN 2022

Human-induced climate change was responsible for 60% of all heat-related deaths between June and August 2022 in Switzerland – and more than half of those were in women older than 65.



Interventions are typically published openly online. Dialogues can follow, through academic publications, commentaries, blogs or social-media posts¹³. Such transparency bolsters the public’s acceptance of academics intervening in proceedings.

To cut through, scientists should present their evidence consistently. For example, they should use the same base year for comparing emissions reductions (such as 1990), and explain why they are observing or projecting certain phenomena. In the KlimaSeniorinnen case, for example, the judges in Strasbourg were eager to understand why women experience the effects of climate-change-related heat-waves more widely and vehemently than men

“Assessing Switzerland’s performance in climate law and policy required fresh types of evaluation.”

do. Our brief substantiated that this is the result of a combination of factors, such as changes in reproductive hormones that negatively affect cardiovascular fitness and thermoregulatory responses¹, and broader gender-related roles and behaviours, including solitary living¹⁴.

Learn from interdisciplinary work

Communicating with diverse groups can be hard, but brings benefits. For example, we learnt that judges find it easier to grasp heat-related deaths in terms of numbers of people rather than percentages of a population. As researchers, we realized that questions around sex and gender differences in health responses to climate change were under-studied. Assessing Switzerland’s performance in climate law and policy required fresh types of evaluation that governments are not currently doing.

We thus encourage researchers to perform more studies to probe causal links between climate hazards and impacts on humans, which can be fed into climate litigation. For example, can links between claimants’ losses and the emissions of defendants be established? In what way can positive actions of defendants contribute to better observation of the rights of claimants?

Connections between climate sciences and law and other humanities also need to be strengthened. More research is needed on how concepts such as attribution, causation, affectedness, risks, probabilities and evidence translate across disciplines.

We strongly encourage scientists to engage with climate litigation. Doing so will increase their understanding of how lawyers and policymakers read their findings, help to overcome disciplinary barriers and increase the effectiveness and real-world impact of climate research. Lawyers, too, stand to win: rather than risking

shooting in the dark with their cases, working with scientists helps them to sharpen their arguments, and ultimately, achieve groundbreaking successes in court to spur climate action. Effective interdisciplinary collaborations are crucial to tackle climate change justly.

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