



Chapter Zero and Wellcome

The human aspects of climate and business:

THE CLIMATE-HEALTH NEXUS

The human aspects of climate and business: the climate-health nexus

Chapter Zero is working with Wellcome to ensure boardrooms are addressing the critical climate-related health issues as part of good governance.

The partnership and this publication highlight:

- climate-health impacts are here
- they are (becoming increasingly) material
- they are by and large not being considered strategically by boards
- the time for board action is now

The Chapter Zero/Wellcome partnership

This partnership commenced in April 2026. We instigated an immersion phase which drew on Wellcome’s scientific research and expertise on climate and health as well as interviews with Chapter Zero Fellows and members to gauge current board discussions on the health impacts of climate change and opportunities for encouraging more explicit and strategic consideration of them. This publication and its case studies/articles are the output of that initial phase. Next comes the creation of practical toolkits, checklists and briefings that will help directors address this topic in the boardroom.

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Businesses are already experiencing direct operational impacts from climate-related health risks

Given the record-breaking heatwaves of the Summer of 2026, companies are already reacting to extreme heat, but long-term scenario planning is limited. Chapter Zero's members tell us that operations are being impacted in the UK and abroad, with companies adapting to extreme weather events:

“

Metals production is an extreme work environment and adding heat makes it more so. It's about adaptation: we have to pay workers more, put in cooling systems and different shift patterns.”

“We faced challenges in the heatwave two summers ago. We had drivers driving older buses in really extreme heat. It becomes a risk to be managed.”

“Heat creates specific on-site risk – dehydration, fatigue – and we have to take account of this for health and safety reasons.”

At present responses are often tactical versus strategic, and long-term scenario planning for higher global temperatures is limited:

“We're managing it tactically rather than strategically, we haven't thought about prolonged heatwaves at 40°C for example.”

“If we're in a 4°C world we can't have the kilns running and workforces working; we'll need to plan for this scenario.”

A climate-health lens can help boards look beyond individual extreme weather events to the cumulative impacts on employees, customers and business resilience, and where these may become structural risks.

The heatwave in numbers

2026 was the first year on record to reach 35°C in May, June and July, and by 15 July had more days above 30°C than the whole of 1976 (Met Office).

130 times

A rapid Met Office attribution study found climate change made the summer heatwave around **130 times more likely** (Met Office).

2,877

More than **2,877 excess deaths** estimated in England and Wales during May and June heatwaves (GOV.UK).

42%

Analysis suggests **climate change is responsible for around 42% of total heat-related deaths** across May and June heatwaves (London School of Hygiene and Tropical Medicine).

Business impact

6%

BRC footfall data shows 6% decline in high-street footfall in early summer.

£1.15bn

LSE's Grantham Research Institute estimated the cost of the UK's heatwave at **£1.15bn in lost output, with 24m working hours gone**, and outdoor and lower-paid staff hit hardest.

£4.4bn

The think tank Verdant estimates the cumulative bill since May at **£4.4bn, heading towards £25bn a year by 2030.**



About Wellcome

Wellcome's vision is a healthier future for everyone. It supports discovery research into life, health and wellbeing. It is taking on three urgent health challenges: mental health, infectious disease, and climate and health. Wellcome is a politically and financially independent global charitable foundation.

The Wellcome Trust is a charity registered in England and Wales, number 210183. Its sole trustee is The Wellcome Trust Limited, a company registered in England and Wales, number 2711000, whose registered office is at 215 Euston Road, London NW1 2BE, UK.

Foreword from Wellcome



Climate change is already undermining global security and prosperity, and further significant impacts on human health, wellbeing and livelihoods are inevitable. In recent years, we have seen with our own eyes that heatwaves, droughts, floods and storms are increasingly common and climate science indicates that this situation will continue to deteriorate. This is the new climate reality for which we are dangerously ill-prepared.

And this is a major problem for business. Failure to reduce emissions to slow future global heating, while adapting to the growing impact of climate change, is threatening business operations around the world. A recent World Health Organization and World Meteorological Organization report estimated that worker productivity drops by 2–3% for every degree above 20°C, and that as temperatures rise, employees are exposed to multiple health risks including heatstroke, dehydration, kidney dysfunction, and neurological disorders, all of which hinder long-term health and economic security.

There is however a window of opportunity for boardrooms to implement known solutions that protect their business, workforce and customers. And increasingly, we know the solutions – local, regional and global policies that work to protect people and the climate. We understand the health and economic benefits of climate action as well as the human and business costs of inaction. We can no longer delay. We must adapt to the climate already here and rapidly move to clean energy systems that give businesses – and humanity – the best chance to thrive in the future.

At Wellcome, we fund science that supports decision-makers to understand the impact of climate change on health, and to implement evidence-based solutions. Our mission is to achieve better health outcomes for everyone and to-date we have invested nearly £500m in new knowledge and evidence generation around the world.

Together, we need the courage and conviction to put people's health at the heart of climate action. To act now is to prioritise a healthy workforce and an environment in which employees and businesses can flourish: a sustainable, resilient and healthy future for business with a positive connection to customers and communities alike for generations to come.

We're delighted to partner with Chapter Zero to support board directors navigate the climate and health challenges ahead, mitigate risks and deliver on their board responsibilities to act in the long-term interests of their business. Acting with urgency on climate change and its impact on health just makes good business sense.

Alan Dangour
Director of Climate & Health, Wellcome

Foreword from Chapter Zero



Explicit board-level discussion of the human aspects of climate and business is currently limited. Climate-related health risks rarely appear on board agendas as a named, integrated issue, although the underlying risks are often already present.

We need to see how these risks impact oversight of core business strategy, at the nominations/remuneration level, with audit and risk committees and more generally in terms of corporate culture and purpose.

Where these risks surface today, they are typically exacerbations of existing risks; most commonly as operational or health and safety concerns, with extreme heat and flooding the most observed by Chapter Zero members. Climate-health risk is mostly recognised as a cost or threat to manage, rather than as a source of strategic opportunity.

Business exposure is broad and material. Climate-health risks reach every stage of the value-chain from raw material sourcing and supplier workforces, through operations and distribution, to customers, after-sales and end-of-product-life, and across every industry, in different but recognisable ways.

We have found that climate-health is a strategic lens that surfaces both risks and opportunities and connects climate strategy to a board's duty of care to people. Treating it as a single, integrated issue across three lenses – workforce, customers, community and two strategies – mitigation, adaptation, applied at every stage of the value-chain, produces sharper decisions and captures co-benefits.

Climate action delivers measurable business value and is itself a strategic opportunity, not only a cost to avoid. Integrated climate-health action unlocks cost reduction (workforce productivity, fleet electrification, energy efficiency), revenue (healthier products, transition-aligned services, new market categories), capital efficiency, supply chain resilience and risk reduction – with co-benefits across air quality, sustainable materials and electrified operations.

Importantly, climate-health risks and opportunities should be recognised across existing governance moments. They already surface in board discussions of audit, risk, strategy, people and remuneration, so the task is to name them explicitly, join the dots and ensure the right questions are being asked in the right rooms.

Vicky Moffatt,
CEO, Chapter Zero



About Chapter Zero

Chapter Zero, the philanthropically funded Directors' Climate Forum, is one of the founding Chapters of the Chapter Zero Alliance – a global network of 34 Chapters in 70+ countries. Its purpose is to equip and inspire Chairs and non-executive directors to lead on climate from the boardroom.

Chapter Zero operates from a UK base with global impact. As an incubator of best practice, with toolkits and thought leadership that are disseminated around the world, Chapter Zero delivers briefings and masterclasses for its vibrant peer-to-peer community. Its programmes bring the latest thinking and practical experiences of board oversight and governance for the climate transition.



With thanks to Eden McCallum for its team's expertise and support throughout this climate-health project undertaken by Wellcome and Chapter Zero.

Climate change has been tackled as a net zero project; this misses the human dimension

Since the Paris Agreement, net zero has given the climate agenda a target. But this way of thinking has not to date captured the full human consequences of climate change, particularly the impacts on health.

For many boards, climate and health are still considered through separate lenses: climate through emissions, transition and physical risk; and health through workforce safety, wellbeing and customer or community impacts. A climate-health lens connects these discussions by asking how climate hazards affect people, and what those impacts mean for the business.

In partnership with Wellcome, Chapter Zero is translating climate and health research into practical, board-relevant insights. The aim is to help non-executive directors understand where climate-related health impacts may create material risks or opportunities across the workforce, customers, communities and value-chain.

Making the link between climate and health explicit can improve visibility of risks that already exist within the business, sharpen strategic discussion and reveal opportunities or co-benefits that may be missed when these issues are considered separately.

These impacts will not look the same across every business. Climate-health risks are highly dependent on sector, geography, workforce, customer base and value-chain. The relevant question for boards is therefore not simply “what are the climate-health risks?” but “where, in our business and value-chain are people exposed, and what could that mean for resilience, performance and strategy?”

That means looking beyond direct employees to contractors, customers and communities, and considering climate-health impacts across the value-chain rather than in isolation.

A duty to promote success but not necessarily to report

Clearly, directors owe a duty to promote the success of the company for the benefit of its members, and to exercise reasonable care, skill and diligence. Both duties require directors to identify the material risks facing the business and satisfy themselves that management has robust

processes to manage them. As **Julie Hirigoyen** points out (pp. 10-11) climate-related physical risk is now squarely material: it threatens workforce health and productivity, among other things.

Richard Barker of the ISSB adds (pp. 16-17) that while companies might carry climate-health-related risks, hurdles must be jumped for information about those risks to be reported to investors. There is judgement to be made in this. He stresses that it is for a company itself to decide on information about its business that is material to its investors.

What does it take for a company to decide that there is material information to disclose? Physical risks to employees, reputational risks for the business, possible exposure to legal or regulatory change affecting the business model and even the possibility of litigation, he suggests.

But let's be clear, formal reporting often just articulates something companies are thinking about anyway – disclosure can follow awareness rather than create it.

A question of measurement and concrete actions

The measurement gap is the core problem says **Tina Mavraki** (pp. 24-25). Without measurement there is no analysis of the numbers relating to climate and health, and therefore no scrutiny.

She advocates attribution – the discipline of linking climate change to specific health and business outcomes – and says that the most effective route into the climate and health conversations is to identify where the pain is greatest and work backwards.

Whatever the approach, concrete actions will shift the dial. **Patricia Rodrigues Jenner** points out (pp. 38-39) that specificity and product relevance drive board engagement.

Flooding, droughts, fires, pollution, as concepts, are concrete and tied to specific products and geographies. She says that concrete case studies are starting to bring the climate-health story home, and product innovation is already occurring in the finance sector. For instance, parametric insurance products are emerging that pay out when extreme heat triggers are breached, compensating for lost workdays.

Productivity and sickness data are compelling entry points

What is key is shifting the conversation from being focused on something that is purely operational to one that encompasses workforce welfare. Productivity and sickness data can be compelling entry points for boards.

Jonny Wates says (pp. 34-35) that the conversation has moved from safety to health and safety, but the climate dimension is more recent and still emerging. Although heatwaves have affected people on building sites directly, these events are still not viewed as an overarching integrated climate-health issue.

He adds that climate-health themes are nevertheless entering strategic planning and market opportunity discussions, even if not labelled as such.

Sharing learnings with other directors to understand how this new issue is impacting resilience/profitability/growth, asking the right questions at board level, understanding how climate and health risk is impacting governance, asking for reports on the human impacts of climate change and keeping the topic on the board agenda will all help.

Climate action is the greatest health opportunity of the 21st century and now we must build the tools, methodologies and frameworks for boardrooms to lead on these human aspects of climate change.

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Why climate-related health risk is a corporate governance issue



Climate risk – including the acute, human risk of extreme heat, drought and flooding – sits within, not alongside, directors' existing fiduciary and care duties across every sector, says Julie Hirigoyen, Non-executive Director on the boards of Willmott Dixon Holdings Ltd, The Kings Cross Group and Thriving Investments Ltd; and independent sustainability advisor and member of Chapter Zero.

As I write this, in mid-September 2026, Europe is emerging from a summer that reset the record books. West London hit 38.1°C in August, a new high for the year. Wildfires tore through England's New Forest and across southern Europe. The Rhine and Danube fell to record lows, disrupting power generation and shipping and, in the UK, raising fears over crop losses and food supply.

Provisional figures put excess deaths across Europe from the summer's run of heatwaves at more than 35,000, including at least 2,877 heat-related deaths in England from the May-June episodes alone. That toll, drawn from only around half the continent's countries, is expected to rise further as more data is compiled. On top of which, forecasters are now warning of an active "flash-flood season" as autumn storms arrive on parched, drought-hardened ground.

These are no longer once-in-a-generation events. For UK boards, across every sector, the implication is straightforward: extreme heat, drought and flooding are recurring, foreseeable risks to employees, customers, communities, supply chains and physical assets. That raises a question of corporate governance.

What are directors required to do about it?

Under the Companies Act 2006, directors owe a duty to promote the success of the company for the benefit of its members (s.172), and to exercise reasonable care, skill and diligence (s.174). Both duties require directors to identify the material risks facing the business and satisfy themselves that management has robust processes to manage them.

Climate-related physical risk is now squarely material: it threatens workforce health and productivity, disrupts supply chains and logistics, exposes occupiers and owners of poorly designed buildings to liability, and affects insurance and asset values. It also intersects with statutory duties under the Health and Safety at Work etc. Act 1974.

A board that delegates heat and weather risk to facilities or operations teams alone, rather than treating it as part of strategic risk oversight, is arguably falling short of the care and diligence the law expects – whatever sector the company sits in.



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Directors should be asking management pointed questions about workforce welfare policies, business continuity planning and the resilience of buildings and supply chains – not waiting for a crisis to prompt the conversation."

The obvious sectors are those facing physical constraints to their operations, such as construction, infrastructure and utilities but, in reality, the risk runs much wider.

Retailers and logistics operators face heat-stressed warehouses, fleets and last-mile delivery; food and agriculture businesses face crop failure and water stress; financial services and insurers face rising claims and stranded assets; manufacturers face plant shutdowns and worker safety issues; and hospitality, healthcare and education providers face vulnerable populations occupying overheating buildings.

Directors of any of these businesses should be asking management pointed questions about workforce welfare policies, business continuity planning and the resilience of buildings and supply chains – not waiting for a crisis to prompt the conversation.

Mandatory TCFD-aligned disclosure already applies to larger companies and financial institutions, and the direction of travel under the ISSB and UK Sustainability Reporting Standards is toward more granular reporting on what governance bodies are actually doing to assess and manage these risks. Many smaller companies with effective boards are voluntarily following suit. Expect extreme heat, drought and flooding to become a standing feature of sustainability reporting for businesses in every sector.

Climate litigation is a real and present threat

Boards should also track the growing wave of climate litigation, which increasingly treats climate risk as material and foreseeable, and directors' response to it as part of their statutory s.172 and s.174 duties.

In *ClientEarth v Shell's Board of Directors* (2023), the High Court found no prima facie case that Shell's directors had breached their duties, but Mr Justice Trower accepted that weighing climate risk against a company's many competing considerations is a "classic management decision" for the board. In other words, directors are expected by the courts to turn their minds to climate risk, weigh it seriously and be able to evidence that they have done so – including, increasingly, its physical and health-related dimensions, not just transition and emissions strategy.

The direction of travel is clear. Investors, regulators and the courts are converging on the view that climate risk – including the acute, human risk of extreme heat, drought and flooding – sits within, not alongside, directors' existing fiduciary and care duties across every sector. Boards that can demonstrate active, evidenced oversight of these risks, from workforce safety to the resilience of their buildings and supply chains, are best placed to withstand both the events themselves and any future legal or regulatory scrutiny that follows them.

Julie Hirigoyen,
Non-executive Director on the boards of Willmott Dixon Holdings Ltd,
The Kings Cross Group and Thriving Investments Ltd;
independent sustainability advisor and member of Chapter Zero

The state of play in the boardroom

Boards already discuss climate change, health and safety, and business resilience. What is less common is explicit consideration of how climate change may affect the health of employees and customers long-term, and what those impacts could mean for the business. Chapter Zero members tell us:

"It's really not a topic that appears as a feature in its own right; it's tangential rather than direct."

"This is not terminology or an area of focus that is explicit, we've never looked at this as an overarching integrated issue."

"We are in the foothills; there is not high-level visibility of the interconnectedness of these issues."

Often climate-health risks appear as exacerbations of existing risks but climate as a driving or exacerbating factor is rarely discussed:

"Climate is not segregated out as an aggravating factor."

"Climate change increases the need rather than creating a new need."

Where they do appear, risks often present as operational or health and safety concerns, with extreme heat and flooding being the most observed amongst members:

"It becomes an operational risk and a health risk when we have people doing their jobs during a heatwave and we have customers to keep safe."

Climate-health framing is seen as a useful lens to view ESG strategy through and a call-to-action, though companies often don't lack the 'will' rather the means:

"The health risks are a different lens to view this through. It becomes another reason to do it. It's not that companies don't have the will, it's that they don't have the means."

The opportunity is to make the link from climate hazard to health impact to business consequence more explicit so that these risks can be considered within existing board discussions on material risk, resilience and strategy.

How do we mobilise action?

We know that robust economic impact data and frameworks demonstrating materiality are needed. Specific sector-level economic data linked to the value-chain is required to move boards. Chapter Zero members tell us:

"People are not even measuring the cost – because they cannot measure it, they cannot pay attention to it. Go where it hurts the most and where the buck stops. With temperatures of X your factories will be shut."

"Ultimately, it's the economic data that's needed and landing it in the value-chain; at the moment you're dependent on people having the interest. If it lands in the value-chain there's a hurdle in the way and you've got to deal with it."

"Economic data needs to be tied to specific industries rather than presented at an aggregate level."

Data attributing climate change to specific outcomes and financial consequences would be compelling:

"Attribution is a notoriously futuristic discipline, but we need to be able to join the dots between what we're seeing and climate change."

"The attribution and cost benefit has to be compelling."

Frameworks and cross-industry collaboration are required to motivate board-level action:

"The challenge is to translate the data into behaviours and ways of working: cross-industry collaboration and common frameworks."

"It's just a matter of: how do you move? How fast do you dare move while trying to balance the cost of change?"

We need to make the case for change at an industry and value-chain level, and to inspire the behaviour change needed to tackle these issues in the boardroom.

Mitigation and adaptation to climate-health risks is critical

Mitigation and adaptation of climate-health risks should be considered for workers, customers and communities alike, and across value-chains. If mitigation and adaptation actions are either poorly designed or implemented, new tensions will arise.



Value-chain



Considerations

Workforce
Health, safety and productivity of employees, including those in heat-exposed, outdoor or frontline roles

Customers
How climate-driven health impacts shape demand, product use, and the customer base over time

Community
Health of the communities in which the business operates, sources from, and holds social licence

Response categories

Mitigation
Actions that reduce greenhouse gas emissions to limit the severity of future climate-related health risks

Adaptation
Actions that build resilience to the climate-related health impacts already occurring or expected in the near term

If poorly designed or implemented there can be a tension between mitigation and adaptation efforts and/or the people they impact, e.g. short-term solutions to heat stress in the workforce could drive up carbon emissions, and/or drive up prices for customers. Mitigation and adaptation should be considered in an integrated way, and trade-offs explicitly identified and managed.

Source: Eden McCallum

Climate and health: the standard-setter's view



Richard Barker, Board Member of the International Sustainability Standards Board, says that while companies might carry climate-health-related risks, a couple of hurdles need to be jumped for information about those risks to be reported to investors. The first is that they must potentially affect the company's financial prospects. The second is that those effects must be capable of affecting an investor's decision about financing the company. There is judgement in this. It is for a company itself to decide on information about its business that is material to its investors. To the extent that climate-health risks can be expected to grow in scale and scope, disclosure about them would grow also.



A challenge for sustainability reporting is how to reconcile macro-level climate impacts with entity-level financial consequences. It's one thing to say this is a macro impact and another to show the impact on the company."

The scale and complexity of the problem is part of the challenge. Barker reminds us that people generally (let alone boards) struggle to relate to a 2° or 3° world, and long-term, abstract outcomes might not move boards or consumers to act. A role for reporting is to anchor climate-health risk in the present, identifying risks and opportunities and making transparent corporate planning.

These climate-health-related risks in question might be, for example, heat exposure from working outdoors (a longer-term climate-health risk) or, for example, exposure to fire risk (perhaps a risk that is present now).

Reporting standards and materiality

A challenge for sustainability reporting is how to reconcile macro-level climate impacts with entity-level financial consequences. "It's one thing to say this is a macro impact and another to show the impact on the company," says Barker.

He reminds us that IFRS Sustainability Disclosure Standards are either adopted or in the process of being adopted across 46 jurisdictions. IFRS S1 sets out broad requirements for reporting on sustainability-related risks and opportunities affecting financial prospects, over the short, medium and long-term, while IFRS S2 focuses on the subset of climate-related risks and opportunities.

The ISSB's work plan includes researching the need for more specific requirements relating to an entity's workforce (both within its operations and more broadly in its value-chain).



What does it take for a company to decide that there is material information for them to disclose in relation to climate-health risks?

A variety of routes includes physical risks to employees, reputational risks for the business more broadly, possible exposure to legal or regulatory change affecting the business model, possible litigation, and so on."

Disclosure dynamics and social norms

"As IFRS S1 reporting becomes more widespread, we can expect that the combination of greater corporate and auditor experience, wider and deeper data availability, and more effective and refined engagement with investors, will lead to increasingly consistent and comparable norms of disclosure," says Barker. "If climate-health risk emerges as an issue widely understood to be within scope, then of course more companies will start to report and a virtuous cycle of improved disclosures would likely follow."

But the question remains: what does it take for a company to decide that there is material information for them to disclose in relation to climate-health risks? A variety of routes includes physical risks to employees, reputational risks for the business more broadly, possible exposure to legal or regulatory change affecting the business model, possible litigation, and so on. Such issues will vary by industry and geography. For example, companies in the fast-moving consumer goods industry might be more likely to be consumer-facing, visible and with value-chains that are long and relatively exposed to issues of social licence to operate.

These issues are likely to be familiar to the business already. Barker reminds us that "formal reporting often just articulates something companies are thinking about anyway – disclosure can follow awareness rather than create it".

Richard Barker
Board Member,
International Sustainability Standards Board

Boards can take action and surface climate-health risks through existing committees and strategy discussions

Governance infrastructures are, in large part, already in place to surface, discuss and oversee climate-related health risks in the workforce and value-chain. Committee structures provide for this. Asking the right questions – the difficult questions – is vital, and not only questions based on what has gone before but also on what we are experiencing now and the potential for worsening climate-related conditions for people.

“This comes up under health and safety – workforce is our top priority – we’re kind of used to endless rain but heat is new and so is what needs to be done to protect people in extreme heat.”

“[In the water industry] the operational discussion on extreme weather is constant and this enters the board agenda through the audit and risk committee. We’ve also incorporated social capital value into executive incentives in the Remco.”



GOVERNANCE MOMENTS

QUESTIONS FOR BOARDS TO CONSIDER

ESG COMMITTEES

The ESG Committee plays a coordinating role for climate-health issues; questions will be repeated across other committees/governance moments

- How will climate-health risks (extreme heat, air quality, disease, extreme weather) affect our business over the next 10 years?
 - Consider consumption patterns, our employees at work or getting to work, our supply chain workers, secondary effects, e.g. disease risk
- Are these risks material? How can we adapt, mitigate or manage them?
- How does our social agenda need to be adapted to reflect climate-health impacts and risks?
- What are the strategic implications of the risks?
 - Consider capex, opportunities, shifts in operations
- Does this insight about climate-health (e.g. heat) impacts affect our decarbonisation plans? Can we accelerate our energy transition?
- What should we be reporting on relating to climate-health impacts?

STRATEGY

- Have we stress-tested our strategy and capex planning against credible 2°C and 3°C scenarios, including the health impacts on our workforce, customers and operating environment?
- Are we positioned to capture the commercial opportunities that integrated climate-health action unlocks, such as new product categories or transition-aligned services?

AUDIT & FINANCE

- Are climate-health risks priced into our financial projections and capex planning?
- Are assumptions on insurance costs, healthcare costs and workforce productivity realistic, within the context of a changing climate?

RISK REGISTER

- What climate-health risks (heat, air quality, disease, extreme weather) need to be added to the risk register?
- What are the implications for health and safety, particularly for outdoor, frontline and field-service workers?
- Are we monitoring reputational and litigation risks from climate-health exposure, including in supply chains and workforce protection?

PEOPLE POLICIES

- Do our people policies meet our duty of care under increasingly climate-stressed conditions for our own employees and value-chain workers?

PEOPLE REPORTING / DISCLOSURE

- As climate-health workforce metrics become disclosable (akin to gender pay gap reporting), are we data-ready, e.g. on heat-related absence, productivity loss?

REMUNERATION COMMITTEE

- Do executive incentives reward genuine progress on both mitigation and adaptation?

Source: Eden McCallum

Climate and health: boards, committees and the strategic discussion



For most boards, health and climate have traditionally been separate agenda items and different risk categories, writes Gillian Karran-Cumberlege, Head of Chair Advisory and Co-Founder Fidelio Partners, and Chapter Zero Fellow. She points out that, arguably, the primary challenge for boards is navigating increasingly interconnected risks and the interplay of climate and health is becoming one of the best examples of this.

In Fidelio's board assignments to date we have found boards with an explicit health mandate to think in the most interconnected way about climate and health. This includes, for example, building an understanding of how diseases that have long been endemic in warmer zones are spreading to more temperate climates with the corresponding impacts on populations and healthcare providers.

We are now, however, also seeing signs that the compartmentalisation between health and climate is breaking down. This is driven principally by the physical impact that extreme climate patterns are having across multiple businesses with heatwaves, fires and flooding all disrupting supply chains and production and, most importantly, also presenting a very real danger to employee and contractor safety.

For the majority of boards, committees will have a key role to play in ensuring that the board is apprised of the challenge that climate instability represents to employee safety and wellbeing, so that the company can be agile in its response. Given the multifaceted nature of the climate challenge, there are various committee touch points.

The audit and risk committee (ARC) is well placed to develop a risk framework to interrogate the risks that climate presents to the business, including the safety of employees. ARC will typically also oversee the adoption of policies which underpin climate resilience.

Arguably the key lens for considering the risks that climate presents to employee health and wellbeing is health and safety which often sits with sustainability, ESG, or people and culture at a committee level.

In well-run engineering, manufacturing or extractives companies, health and safety will be a board agenda item and many boards begin their discussion with a health and safety update. Failure to mitigate climate risks to health in the business will be reflected in remuneration with the remuneration committee being crystal clear that accidents and mortalities have a direct impact on bonuses.



The audit and risk committee (ARC) is well placed to develop a risk framework to interrogate the risks that climate presents to the business, including the safety of employees."



Extreme heat results in a significant increase in hospital admissions. Working age adults are not the primary risk group but can also suffer from heat-related impacts and, of course, employees may also bear the responsibility of caring for family members who have been affected by the heat."

What about the strategic discussion?

The strategic discussion of the interplay between climate and health belongs at board level. Increasingly, for example, climate-health impacts are extending to head office. It's true that office employees frequently benefit from air conditioning, but this may not have extended to the commute. Moreover, rail, road and flights are all experiencing disruption from weather extremes.

Companies need to be alert to extreme weather and its impact on employee health. The company has a duty of care to employees, and the board will want to see resilience being built into working practices as well as infrastructure. A forward-looking board will be considering how climate is evolving and the impacts this may have on operations and employees. Nor will the consideration be limited to direct employees, as it is contractors that are too often in harm's way.

Extreme heat results in a significant increase in hospital admissions. Working age adults are not the primary risk group but can also suffer from heat-related impacts and, of course, employees may also bear the responsibility of caring for family members who have been affected by the heat.

There is another dimension which warrants board attention in the context of climate and health. Mental health can also undoubtedly be affected by climate in myriad ways. This includes anxiety about climate on a personal and societal level. With the drip-feed of social media and the polarisation of public opinion on climate issues, including regarding the veracity of climate change, boards do well to understand the sentiment and mood within the company. As climate instability and uncertainty increases, an effective board will consistently be considering resilience which, in turn, will serve to underpin trust and confidence of employees.

Arguably, the primary challenge for boards is navigating increasingly interconnected risks. The interplay of climate and health is sadly becoming one of the best examples and therefore needs to be on the board agenda.

**Gillian Karran-Cumberlege
Head of Chair Advisory and Co-Founder Fidelio Partners,
and Chapter Zero Fellow**

Boards can test resilience to climate-health risks; opportunities to do so lie at every stage of business

The questions board members can raise in the boardroom can be broken down to reflect every stage of the value-chain. There is no single question that is too difficult to address; instead there are myriad questions that reflect real business risks that will test resilience.

VALUE-CHAIN STAGE	QUESTIONS FOR BOARDS TO CONSIDER
Raw material sourcing	How exposed are we to climate-health risks in our sourcing geographies – and where could investing in supplier workforce health build resilience?
Procurement & supply chain	Do our contracts and supplier audits adequately account for climate-related health risks, or are they designed for episodic rather than systemic disruption?
R&D (product and service design)	Are our products and services designed for the climate-health conditions of the next decade or two? Where could designing for population health and climate together open new markets?
Operations & service delivery	- What do our operations look like if climate-related health risks, e.g. extreme heat, are systemic rather than episodic? How does that impact our workforce? - How do we adapt now in a way that mitigates future risk? <i>i.e. taking a long-term strategic view versus reacting now</i>
Distribution & logistics	- Do we have visibility of the heat and air-quality exposure facing our distribution workforce, including third parties? - Where could fleet electrification or modal shift cut emissions while reducing exposure?
Sales & marketing	- How does a hotter climate impact customer behaviour? (Do we already see changing demand during heatwaves?) - Do we have customer segments particularly vulnerable to climate-health risk, e.g. in the most vulnerable geographies?
After-sales & customer service	Do we have a clear picture of our vulnerable customer obligations during extreme heat/weather events, and are our service teams equipped to meet them?
End of product life	- How are workforce and community health impacts in our end-of-life operations changing? - Where could circular models cut emissions, reduce exposure, and create new revenue?

In a 2°C or 3°C world, which parts of our business are most exposed, and where could integrated action on climate and health open new markets, build resilience, and protect our licence to operate?



In a 2°C or 3°C world, which parts of our business are most exposed, and where could integrated action on climate and health open new markets, build resilience, and protect our licence to operate?

Boards are not discussing climate and health because there is a measurement gap



Tina Mavraki is a FTSE100 Board Director, executive leader and advisor across industries; she is also a Chapter Zero Fellow. She reminds us of the old adage that you cannot manage what you cannot measure. That is why, to date, conversations about climate–health risks are largely absent in the boardroom.

“Climate-health risks are understood at a macro level but simply do not feature in board discussions,” says Mavraki. “They are managed as business-as-usual adaptation rather than as a strategic risk.”

She explains that this is largely because the human aspects of climate change – that is the impact on health – have an incremental effect on business, especially where the impact is mental-health or heat-related. “Where heat does show up, the response is usually tactical: you change shifts, you invest in facilities,” she says. “But it is not strategic.”

Mavraki points out that, generally speaking, boardroom climate conversations are often framed too narrowly. “Carbon is dominating the agenda at the expense of broader environmental and health interconnections. It’s too easy to just focus on carbon. The interconnection of these things matters,” she says.

It is not surprising that the focus to date has been on what can be readily evaluated; but, going forward, there needs to be a mechanism by which these broad environmental and health risks can be measured and overseen by boards who are inspired to ask the right questions.

The measurement and attribution challenge

“The measurement gap is the core problem,” says Mavraki. “Companies are not even measuring the cost of the human aspects of climate change and, because they cannot measure it and they cannot analyse the numbers, they do not pay attention to it.”

Attribution – the discipline of linking climate change to specific health and business outcomes – is the critical missing discipline, she says. “It is a fundamentally underdeveloped field; a notoriously futuristic discipline. Not many people do it and do it scientifically,” says Mavraki.

“The attribution and cost benefit have to be compelling,” she says. “Without credible attribution and cost-benefit analysis, there is no mechanism to bring these risks onto the board agenda. The economic case must be made before attention follows.”



Climate–health risks are understood at a macro level but simply do not feature in board discussions. They are managed as business–as–usual adaptation rather than as a strategic risk.”



The most effective route into the climate and health conversation is to identify where the pain is greatest and work backwards.”

What would help now

Generalisations are not helpful. “Economic data need to be tied to specific industries rather than presented at an aggregate level,” says Mavraki. “A municipality might track workforce productivity across the economy, but a company needs the numbers to land at the company level.”

She reminds us, scale matters. “Evidence needs to demonstrate material impact to command board attention,” she says. Those incremental effects of climate on health are not going to shift the dial; there must be something substantial happening if there is to be action.

“The most effective route into the climate and health conversation is to identify where the pain is greatest and work backwards,” says Mavraki. “Go to where it hurts the most and where the buck stops then build the attribution and cost case from there.”

ESG framing is part of the problem

Generally, climate-related health risks tend to surface through operational health and safety risks rather than through climate or ESG frameworks.

In some industrial sectors extreme heat is a by-product of business as usual that will only worsen as the planet warms, producing severe working conditions. So far, there are largely short-term adaptation responses to these conditions, framed as operational health and safety issues, and not as climate risk. That is not an approach that is going to get climate and health on the board agenda.

Part of the problem, says Mavraki, is that ESG is often misunderstood with risks wrongly classified and not addressed as part of business strategy. “The result is that boards often think about ESG in theory only without tying it to strategy,” she says.

Tina Mavraki
FTSE100 Board Director,
Chapter Zero Fellow

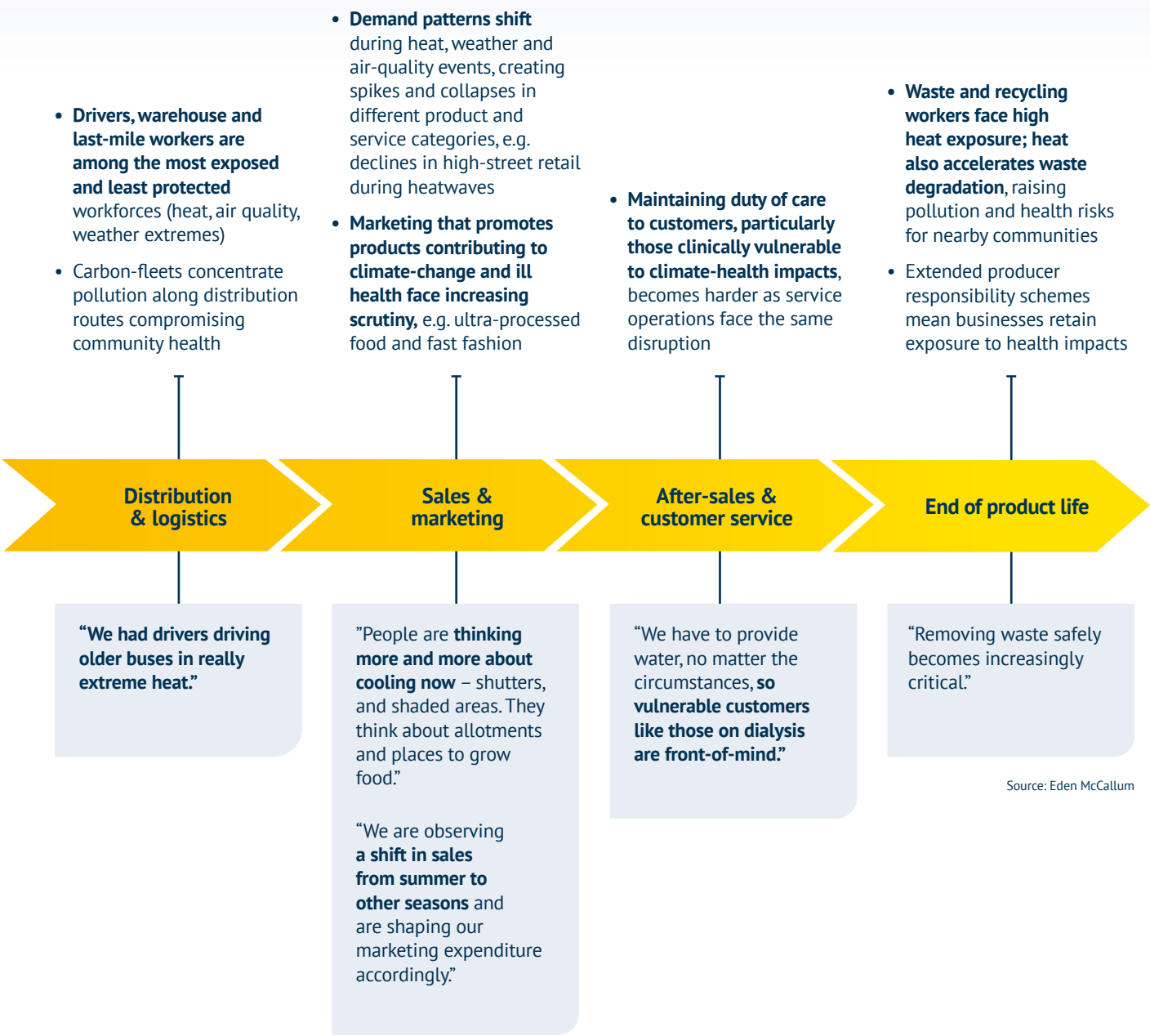
Chapter Zero members tell us climate-health risks have already been felt across value-chains



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Voice
of the market

Businesses will increasingly experience the impacts of climate-related health risks and extreme heat across their value-chains.

We have already heard from Chapter Zero members that they are experiencing the impacts of climate-related health risks and heat at all steps of the value-chain. This is what they tell us:



Workforce impacts are already measurable, with productivity losses, absenteeism and health liability increasing

We are just starting to identify health risks as climate-related. However, the evidence, especially related to heat stress, is already clear. These risks will become increasingly apparent and will be associated with critical actions at both the company level and the policy level.

Note: Extreme heat is the best-evidenced climate-health risk to the workforce to date. Other risks (air quality, increasing spread of disease) are emerging but are currently less well-quantified.

Heat stress in the workplace has direct operational impacts with 2.4bn workers at risk globally

Productivity loss

- Extreme heat reduces workforce productivity 2–3% with every degree rise over 20°C₁
- In the UK, the summer heatwave of 2026 resulted in 24m hours of lost labour and a £1.15bn hit to the UK economy₂

Labour supply risk

- The pool of workers willing and able to do heat-exposed roles is expected to shrink with increasing global temperatures₃
- Employers will likely be required to increase salaries in these roles
- Migration will be an exacerbating factor

Health and liability costs

- Heat stress causes an estimated 23m non-fatal workplace injuries globally including acute kidney injury and heat stroke
- Heat-related worker compensation claims have increased significantly over the last 10 years in the US with similar trends elsewhere
- Litigation is testing whether specific emitters can be held liable for heat events, e.g. Multnomah County (Oregon) v. ExxonMobil and others over the 2021 heat dome, filed 2023

CASE STUDY

Outdoor work in Spain:

- Spain experiences multiple major heatwaves each summer; agriculture, construction and outdoor service work (which employ over 3m people are highly exposed)
- In Madrid, a 60-year-old street cleaner died of heat stroke during the 2022 heatwave
- This was cited in a 2023 change in Spanish occupational risk legislation requiring adaptation to outdoor work during red or orange heat alerts
- Similar measures are spreading across Europe. By 2025, half of Italy's 20 regions had introduced outdoor work bans during peak heat hours



“Voice of the market

“We might have been used to extreme heat in Spain, but now it comes earlier and lasts longer. The extremes become more extreme. It starts to enter the agenda from an operational point of view. If it's very hot people are less productive and your sick rate goes up.”

Global supply chains are at risk, with certain regions experiencing outsized effects of climate-health risks

Climate-related health risks have impacts across supply chains into regions that may be suffering from extreme climate conditions with the associated stresses on workforces. These global supply chain risks demonstrate that no company should consider themselves truly exempt from building the climate-health nexus into strategy if they are to remain resilient in the face of climate change.

UK trade is directly and indirectly linked to climate-vulnerable economies

- Roughly half of UK total production comes from the sourcing and sales of intermediate inputs (17% sourced from foreign partners)
- This is compounded by additional indirect exposure from tier 2 and 3 suppliers; China is the largest single country supplier to over half of UK manufacturers (mostly indirectly)₁
- Modelling suggests that by 2060, expected global economic losses from, e.g. heat stress, reach 0.6–4.6% of global GDP, with indirect supply chain effects responsible for 12–43% (health impacts 37–45% and labour productivity loss 18–37%)
- Under high-emissions scenarios, supply chain effects become a significant single contributor to economic loss by 2060
- Manufacturing-heavy economies face some of the largest supply chain losses (even despite cooler climates): China is projected to lose 2.7% of GDP and the US 1.8% by 2060 under high-emissions scenarios₂

CASE STUDY

Bangladesh: Heat and flooding drives illness and productivity loss affecting apparel exports

- Bangladesh's ready-made garment industry employs ~4m people and supplies major retailers in the UK
- During Bangladesh's longest heatwave in 70 years in April 2024, workers fell ill on production lines as cooling systems proved inadequate₃
- A 2024 survey of 1,000 Bangladeshi garment workers found 98% noticed rising temperatures, and 78% reported a rise in climate-linked illnesses₄
- Modelling estimates that extreme heat and flooding could erase \$65bn in apparel export earnings from Bangladesh, Cambodia, Pakistan and Vietnam by 2030, directly affecting global supply for major retailers₅
- EU due diligence rules (CSDDD) will require the largest retailers to identify and address harms in their supply chains from 2029



“Voice of the market

“Over 50% of our suppliers are outside the UK, their main direct exposure is climate-related flooding and extreme heat. **We were recently affected by downstream effects of flooding in Chennai.** We don't have direct control but it's a big risk for us.”



Source: (1) A portrait of the UK's global supply chain exposure, Bank of England, (2) Global supply chains amplify economic costs of future extreme heat risk, Sun et al., 2024, (3) Reuters/Context News, Bangladeshi garment workers fall ill as temperatures soar, May 2024, (4) Bangladesh Center for Workers Solidarity / Centre for Labour and Development / The Business Standard, survey of 1,000 RMG workers, conducted 2024, published September 2025, (5) Schroders & Global Labor Institute, "Higher Ground? Fashion's climate breakdown and its effect on workers," 2024

Climate-health events reshape consumer behaviour and demand patterns; extreme heat is already shifting spend

What moves a consumer to buy is shifting. Seasonality is no longer an indication of consumer behaviour. We are seeing uncertainty around how consumers buy (both in-store and online), what they buy, the quantities they buy and the importance of consumer values aligning with those of the business. In the case of health, there will be new consumer behaviour associated with empathy and ethics, and spending will become harder to predict.

Note: Extreme heat is the best-evidenced climate-health risk to the workforce to date. Other risks (air quality, increasing spread of disease) are emerging but are currently less well-quantified.

Extreme heat influences customer behaviour, altering demand dynamics

- Extreme heat can shift demand and, in some cases, impact the commercial viability of products, service lines or business models
 - e.g. high-street retail, outdoor hospitality, beach tourism and ski resorts face changing demand if high heat days increase
- Spending and footfall shift across the day and across seasons; recent evidence from Australian cities shows total daily spending falls 6.8% on days above 35°C₁
- Demand reconfigures across categories, with growth in cooling, hydration and sun protection offset by decline in outdoor hospitality, footfall-dependent retail and traditional seasonal goods
- Businesses with regulated duty-of-care obligations to their customers (utilities, financial services, healthcare) face direct exposure during heat events

CASE STUDY

UK retail: Heatwaves shift footfall and spend away from the high street

- UK retail footfall is known to fall during heatwaves:
 - During the July 2026 heatwave, UK retail footfall fell 6% year on year₂
 - During the June 2025 heatwave, high street footfall fell 3% year-on-year₂
- Heatwaves shift demand towards online channels and away from physical stores, accelerating an already structural challenge for the UK high street



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Voice
of the market”

“Demand is changing, our customers increasingly think about energy-efficiency and heat resilience. In response, we think about everything from insulation to green spaces which also improve overall health.”

Climate and health awareness, framing and governance – views from the membership

Chapter Zero members and Fellows have helped put climate and health boardroom conversations into context to enable us to understand the *status quo* from the boardroom point of view and learn how these nascent conversations are being governed.



Productivity and sickness data are the most compelling entry points for boards. Differentiating between short-term and long-term sick leave attributable to climate events would help make the case.”

Ryanne Van Der Eijk, Chapter Zero member, board member and executive leader in the airline industry

“In Europe, boards are not yet there on climate-health as an explicit agenda item,” says Ryanne Van Der Eijk, Chapter Zero member, board member and executive leader in the airline industry. “Issues tend to surface through operational and safety channels rather than dedicated climate or ESG discussions.”

She says that the link between extreme weather and health is increasingly, though not yet explicitly, framed as climate-health risk at board level. For airlines, the increasing frequency of extremes has made people’s health a more prominent agenda item, shifting the conversation from purely operational to one that encompasses workforce welfare.

“Productivity and sickness data are the most compelling entry points for boards,” says Van Der Eijk. “Differentiating between short-term and long-term sick leave attributable to climate events would help make the case.”

Similar scenarios are playing out in construction. Jonny Wates, Chapter Zero member and board member, says: “The conversation has moved from safety to health and safety, but the climate dimension is more recent and still emerging. Heatwaves have affected people on building sites directly, with executive colleagues becoming more aware than before; but these events are still not viewed as an overarching integrated climate-health issue.”

Wates adds that, by stealth, climate-health themes are nevertheless entering strategic planning and market opportunity discussions, even if not labelled as such. Productivity and welfare are both relevant lenses through which climate-health risks are being viewed, with industry-specific data labelled by Wates as “valuable”. Nevertheless, climate-health risks remain framed largely at the operational level rather than a key element of board oversight.

Claire Hawkings, Chapter Zero Fellow and portfolio non-executive director, agrees: “Climate-related health risk is not typically framed explicitly as a health risk at board level, it tends to enter through operational, ESG or TCFD lenses,” she says. “Some discussions are reactive and anecdotal, others more forward-looking.” However, for Claire there is the expectation that climate-health-related incidents discussed at board level will become more frequent and more severe over time.



Heatwaves have affected people on building sites directly, with executive colleagues becoming more aware than before; but these events are still not viewed as an overarching integrated climate-health issue.”

Jonny Wates, Chapter Zero member and board member



Physical climate impacts on the business are recognised, but the health framing is seen as a different lens, one that adds another reason to act, rather than being a primary driver.”

Claire Hawkings, Chapter Zero Fellow and portfolio non-executive director

She adds: “A distinct and growing thread is workforce mental health and anxiety. Macro issues, including climate change, are contributing to broader anxiety trends. This has reached board level, with a practical response of introducing mental health first-aiders. Physical climate impacts on the business are recognised, but the health framing is seen as a different lens, one that adds another reason to act, rather than being a primary driver.”

Entry points on the board agenda

Audit and risk committees are the natural homes for these issues, alongside dedicated climate change and corporate responsibility updates, says Claire. “Sustainability committees also pick up related themes like supplier commitments to climate change and Scope 3 emissions management. The health lens is viewed as a complementary – rather than central – way of reinforcing the case for action as opposed to opening a new workstream.”

What would be most useful to boards, says Claire, is evidence of the frequency and financial impact of climate events. “This would help discussions on the strategic framing of health impacts and enable tangible and monetary consequences to be understood,” she says. “Additionally, supply chain risk is a familiar board issue, so climate-health risk in supply chains may gain better traction if presented as a consideration of supply chain risk, rather than considering health risk a new risk category. Similarly, connecting climate-health insight to existing operational, people and performance frameworks is more likely to gain traction than introducing it as a standalone issue.”

Devyani Vaishampayan, Chapter Zero Fellow and portfolio non-executive director, says that, in her experience, climate-health issues are currently distributed across multiple board committees with no single owner. “The integration of these threads into a coherent view of climate-health risk is a difficult and ongoing challenge,” says Vaishampayan. “Risks are either framed as climate-related or health-related.”

She points out the priority should not be more data but translating existing knowledge into changed behaviours and ways of working – then building cross-industry collaboration around a common framework.



The priority should not be *more* data but translating existing knowledge into changed behaviours and ways of working – then building cross-industry collaboration around a common framework.”

Devyani Vaishampayan, Chapter Zero Fellow and portfolio non-executive director

Exposure to risk varies by industry; labour and supply chain intensive industries face near-term effects

There are no one-size-fits-all solutions. Putting humans at the centre of critical thinking will reframe how we think about industries. In terms of climate and health, the issues are likely to be grouped by whether they are labour-intensive industries, supply-chain exposed industries, consumer-dependent industries, asset-owning/infrastructure industries, externality-creating industries or capital-allocating sectors. Each grouping will be exposed to climate and health related risk.

CATEGORY	EXAMPLE INDUSTRIES	MECHANISM
Labour-intensive industries	Construction, agriculture, logistics, manufacturing, utilities	• Direct operational risk from workforce exposure to climate-related health risks especially outdoors • Reputational/legal risk from failure to protect people • Access to capital from more ethical funders
Supply-chain exposed industries	FMCG, food & beverage, apparel, pharmaceuticals	• Indirect operational risk via upstream workforce and environmental conditions
Consumer-dependent industries	Retail, hospitality, tourism, public transport, leisure, live events	• Demand-side disruption when consumers can't or won't leave their home (extreme heat, poor air quality, disease outbreaks) or have changing demands
Asset-owning/ infrastructure industries	Healthcare estates, real estate, transport, infrastructure, utilities networks	• Direct physical asset risk and operational failure from climate hazards (e.g. hospitals, transport networks) translate directly into public-health impact
Externality-creating industries	Energy, chemicals, mining	• Legal and regulatory risk from causing or failing to mitigate health harms for communities (from heat, disease and pollution/ emissions)
Capital-allocating sectors	Insurance, banking, asset management, pension funds	• Financial transmission risk through pricing, underwriting, and investment exposure • Investment policies of institutional lenders and investors

Every industry is exposed to climate-health risks, but where and how the risk lands differs across industry categories

Source: Eden McCallum

“There are no one-size-fits-all solutions. Putting humans at the centre of critical thinking will reframe how we think about industries.”



Financial services: climate-health risks don't yet feature in strategic conversations

In the financial services sector, climate risk is no longer just about compliance; increasingly it is seen through the lens of business opportunity. But climate-health conversations don't yet show up at the strategic level. They are a 'second order' discussion for banks and asset managers. It is in the insurance industry where climate-health lands commercially.



Initially, climate risk was driven by regulators requiring financial services companies to think about it in their portfolios. Now it has shifted from being a regulatory risk to being a business opportunity."

Tim Waddell, Chapter Zero Fellow and portfolio Non-executive Director in the financial services industry

"Initially, climate risk was driven by regulators requiring financial services companies to think about it in their portfolios," says Tim Waddell, Chapter Zero Fellow and portfolio Non-executive Director in the financial services industry. "Now it has shifted from being a regulatory risk to being a business opportunity."

Do climate-driven health risks feature in those discussions too? "No," says Waddell. "The only way they would feature is if an equity analyst was looking at a sector or specific company and one of the calculations involves health risks related to climate – but that is a second order discussion."

Patricia Rodrigues Jenner, Chapter Zero Fellow and global Non-Executive Board Director, concurs and points out that short investment horizons limit climate-health prominence across much of financial services. "Climate-related health risks feel too distant and diffuse to drive board-level action, even where underlying climate exposure is acknowledged," she says.

Specificity and product relevance are what drive board engagement. "Flood risk, as well other acute risks such as drought, fires and air pollution, are now taken seriously, even if not everybody is going to be affected by all these," says Rodrigues Jenner. "This is because flooding, droughts, fires, pollution, as concepts are concrete and tied to specific products and geographies."

She adds that rather than being discussed as a direct health risk, climate change enters board discussions primarily through its impact on mortality assumptions. The mortality curve is modelled using Intergovernmental Panel on Climate Change (IPCC) socioeconomic scenarios.

"Under current IPCC scenarios, material climate-related mortality impacts in the UK are not expected within a 30–40-year horizon and therefore do not register as an immediate concern for UK-focused financial liabilities," she says. "It is more effective to flag climate-health risk where it is specific and material (for example, by geography or product line) rather than making broad reassuring statements." Impacts are already relevant through, e.g. heat stress, air quality, disrupted care and localised insurance losses.

Rodrigues Jenner points out that socio-economic deprivation will amplify climate-health impacts when they arrive. "Lower socioeconomic bands are more likely to be subject to problems and existing inequalities will compound exposure to climate-related health harms, even if this is not yet systematically integrated into financial risk modelling," she says. As others have stated before, "climate change takes longer than expected but impacts will happen faster than one can imagine".



Flood risk, as well other acute risks such as drought, fires and air pollution, are now taken seriously, even if not everybody is going to be affected by all these."

Patricia Rodrigues Jenner, Chapter Zero Fellow and global Non-Executive Board Director

Climate-health risks are starting to land

Mark Manning, Chapter Zero Fellow and Sustainable Finance Advisor, points out that we are now starting to see institutional commentary on climate-health risks. Early in 2026, the World Economic Forum flagged climate-health as being "underpriced and underappreciated". The Institute and Faculty of Actuaries has also highlighted how warming can trigger cascading effects through the economy and society, including the spread of infectious diseases, he adds.

"Concrete case studies are starting to bring the climate-health story home, and product innovation is occurring in the finance sector – notably in the insurance sector. For instance, parametric insurance products are emerging that pay out when extreme heat triggers are breached, compensating for lost work days," says Manning.

Waddell adds that insurance is the most obvious area of financial services where climate-health risks land commercially, both as a pricing input and as a growth opportunity.

"For banks and asset managers, the lens is the portfolio rather than own operations," he reminds us. "It's about financial services companies assessing climate risk inherent in their portfolio of assets...associated with companies the financial firm is lending to or insuring."

Getting back to the underlying human factors

Let's not forget that climate-health risks address the human aspects of climate change and the impact those risks have on business. Waddell points out it will be interesting to watch where on the virtue versus value-chain this will land given that climate-health risks only become a board issue once they have clear economic consequences.

For Manning, policy engagement should be front and centre. He points out that government regulation can change the trajectory of the transition and help avoid the most catastrophic outcomes in relation to climate generally, and climate-health risks more specifically.

For now, the harsh reality is that investor and bank engagement in climate-health risks are still limited, with only early indications of climate-health risks showing up in mainstream financial commentary.



Concrete case studies are starting to bring the climate-health story home, and product innovation is occurring in the finance sector – notably in the insurance sector. For instance, parametric insurance products are emerging that pay out when extreme heat triggers are breached, compensating for lost work days."

Mark Manning, Chapter Zero Fellow and Sustainable Finance Advisor

The cost of inaction will grow, and adaptation without mitigation will become unsustainable

The cost of inaction is too high at both a macroeconomic and microeconomic level. Boards will have to think through both the macroeconomics of inaction and the microeconomics.

Macroeconomics

- Unchecked climate change could reduce UK economic output by 1-5% of GDP by 2050 under a 2 degree warming scenario with health impacts a major driver
- This changes the operating environment for every business

Microeconomics: individual businesses face direct losses unless they adapt

- The World Economic Forum estimates companies could lose 6.6%–7.3% of annual earnings by 2035 from unaddressed physical climate risk, equivalent to half the profit loss of the COVID-19 pandemic, occurring every year
- Climate hazards are projected to drive \$560–610bn of fixed asset losses annually by 2035 for listed companies, with telecoms, utilities and travel most exposed

Adaptation alone is a poor economic trade-off; businesses must mitigate too

- Adaptation has diminishing returns at higher warming. At 2°C and beyond, several climate-health hazards including extreme heat, repeated flooding, ecosystem stress may exceed what is economically or technically adaptable
- Mitigation is cost-effective – the Climate Change Committee estimates the UK can reach net zero at a net cost of around 0.2% of GDP per annum, and that this will deliver £110bn per year in average net benefits to the UK between 2025 and 2050
- The corporate ROI on resilience reflects this: companies see up to \$2–19 in avoided losses for every \$1 invested in adaptation, decarbonisation and resilience taken together

Adapting to climate-health risks and mitigating climate impact opens commercial opportunity

- Green markets opportunity is projected to grow from \$5tn to \$14tn by 2030
- Action on climate-health risk creates co-benefits across workforce wellbeing, customer offer and community trust

Green markets opportunity is projected to grow from

**\$5tn to \$14tn
by 2030**

Climate-health risks present both consequences to manage and opportunities to act, across the value-chain

The climate-health nexus is not only loaded with risk but also with opportunity. At each step of the value-chain there is the chance to rethink business strategy in the context of climate and health resulting in a more resilience business plan.

Value-chain stage	Potential consequences of climate-related health risks and opportunities created
Raw material sourcing	– Heat and weather affecting worker health can drive supplier failure and input scarcity, with margin and reputational exposure (especially under rising disclosure requirements) + Investment in supplier workforce health and environmental practices can build supply resilience, reduce input volatility and create differentiation under tightening procurement standards
Procurement & supply chain	– Single-source dependencies in high-exposure geographies create concentration risk; insurance and contract remedies offer less protection where disruption is systemic rather than episodic + Diversified, lower-risk and lower-emission supply chains can reduce volatility, improve continuity and pre-empt regulatory and customer scrutiny on supply-chain health and emissions
R&D (product and service design)	– Products and services not adapted to changing climate-health conditions risk obsolescence and rising regulatory exposure + Designing for population health and climate together, e.g. healthier built environment opens new markets aligned with where regulation, capital and consumer demand are moving
Operations & service delivery	– Heat/weather/pollution can drive absenteeism, productivity loss and rising H&S liability; business continuity plans that don't model climate-health scenarios may be inadequate + Workplace electrification, ventilation and passive design cut emissions while improving workforce health, productivity and retention
Distribution & logistics	– Workforce health impacts (e.g. from heat-stress) are highly visible to customers and could carry financial and reputational consequences + Fleet electrification and modal shifts cut emissions, eliminate air pollution along routes, and protect workforce and community health; increasingly rewarded by regulators and customers
Sales & marketing	– Failure to account for climate-vulnerable customer segments creates reputational exposure; treating demand shifts as one-off disruptions cedes ground to better-prepared competitors + Anticipating climate-health demand shifts, and reframing offers around healthier, lower-carbon options, creates first-mover advantage in regulated and trust-sensitive markets
After-sales & customer service	– Inability to maintain service quality during climate-health events may erode trust, particularly where it is required to support vulnerable customers + Service models that protect and proactively engage climate-vulnerable customers build loyalty and meet emerging regulatory expectations on duty of care
End of product life	– Workforce and community health impacts at this stage carry rising regulatory and reputational risk in the face of environmental justice scrutiny + Circular models, repair, refurbishment, recycling, cut embodied emissions and pollution exposure while creating new revenue from extended product life

Source: Eden McCallum

Health consequences of a changing climate extend to food insecurity and the increasing spread of infectious disease

Climate change is a present and rising risk. For businesses, this means a changing customer base, a more vulnerable workforce, and communities under increasing strain. Here are some harsh truths about the changing world in which we live and work.

“Everywhere more frequent extreme weather events are a growing threat to food production. Following an El Niño, in 2023/24, countries in southern Africa have been experiencing drought that led to a decline in maize production, threatening food security. This has had long-lasting impacts on the countries affected.

Meanwhile, extreme wet weather in the UK in 2026 left farmland and horticultural businesses under water. And floods following Storm Babet in 2023 submerged entire fields, ruining crops.

Globally, one in five deaths are attributable to poor diets caused by low consumption of healthy foods such as whole grains, fruits and vegetables. Climate change will reduce the yields of these foods and put more people’s health at risk.”

Wellcome

“A changing climate has profound implications for human health, with more frequent heatwaves and extreme weather events, changing patterns of infectious disease transmission, deterioration of food and water resources, impacts on socioeconomic conditions, and the exacerbation of existing health challenges around the world. Indicators in this section track the multiple ways in which climate change threatens human health and wellbeing.

- Failure to curb the warming effects of climate change has seen the rate of heat-related deaths surge 23% since the 1990s, to 546,000 a year.
- The risk of wildfires is growing: 2024 saw a record-high 154,000 estimated deaths from wildfire smoke-derived small particulate matter air pollution.
- The global average transmission potential of dengue has risen by up to 49% since the 1950s.”

The Lancet Countdown Report 2025

“Climate change is impacting human lives and health in a variety of ways. It threatens the essential ingredients of good health – clean air, safe drinking water, nutritious food supply and safe shelter – and has the potential to undermine decades of progress in global health.

Between 2030 and 2050, climate change is expected to cause approximately 250,000 additional deaths per year from malnutrition, malaria, diarrhoea and heat stress alone. The direct damage costs to health are estimated to be between \$2–4bn per year by 2030. Areas with weak health infrastructure – mostly in developing countries – will be the least able to cope without assistance to prepare and respond.”

World Health Organisation

“Extreme weather is increasing pressure on health and social care services, with wide-ranging impacts on mental health, service demand and inequalities.

Extreme weather events (such as heatwaves and flooding) are linked to increased mental health-related hospital admissions, GP visits and requests for mental health support. Older adults and people with mental health conditions are particularly vulnerable, noting these groups have higher rates of hospitalisation and mortality during heatwaves.

Healthcare workers and first responders are themselves at risk of mental health impacts due to exposure to extreme weather.

Climate change and adverse weather can worsen inequalities, including health inequalities. As climate change progresses, the health impacts will not be distributed equally. The mental health impacts will be greater for some groups than for others.”

UK Health Security Agency and Centre for Climate and Health Security

“Drought and water scarcity impact health through reduced access to clean water, increased disease risk, poor air quality and food insecurity. They can intensify other climate-related events like heatwaves and floods, worsening health outcomes. Cascading effects across sectors can cause long-term physical and mental health impacts. Water scarcity is rising across the EU, with Mediterranean regions facing the greatest pressure.

Drought and water scarcity affect health and wellbeing in several ways, including via drinking water shortages (both drinking and sanitary uses), increased likelihood of water-, food- and vector-borne diseases, wildfires and poor air quality, and food insecurity and malnutrition. Drought can also worsen the likelihood of other climate-related extreme events and their associated health impacts. For instance, drought can intensify heatwaves leading to more heat stress.”

European Climate and Health Observatory

“Rising temperatures are shifting the geographical range of pathogens and prolonging transmission periods. Foodborne and waterborne diseases due to pathogens such as Salmonella (causes typhoid), Campylobacter (causes bloody diarrhoea) and Vibrio (causes cholera), are particularly sensitive to climatic factors, with evidence indicating an increased risk due to warming.

There is also an increased risk of vector-borne diseases in the UK due to the change in the distribution and activity of vectors such as ticks and mosquitoes. Warmer temperatures may expand the range of tick species which transmit Lyme disease and tick-borne encephalitis. Invasive mosquito species capable of transmitting dengue, chikungunya, Zika viruses, and West Nile virus may establish in the UK as the climate warms.

Modelling suggests that by the 2040s and 2050s, much of England could become suitable for these mosquitoes, with London potentially facing endemic dengue transmission by the 2060s under high-warming scenarios.”

UK Health Alliance on Climate Change

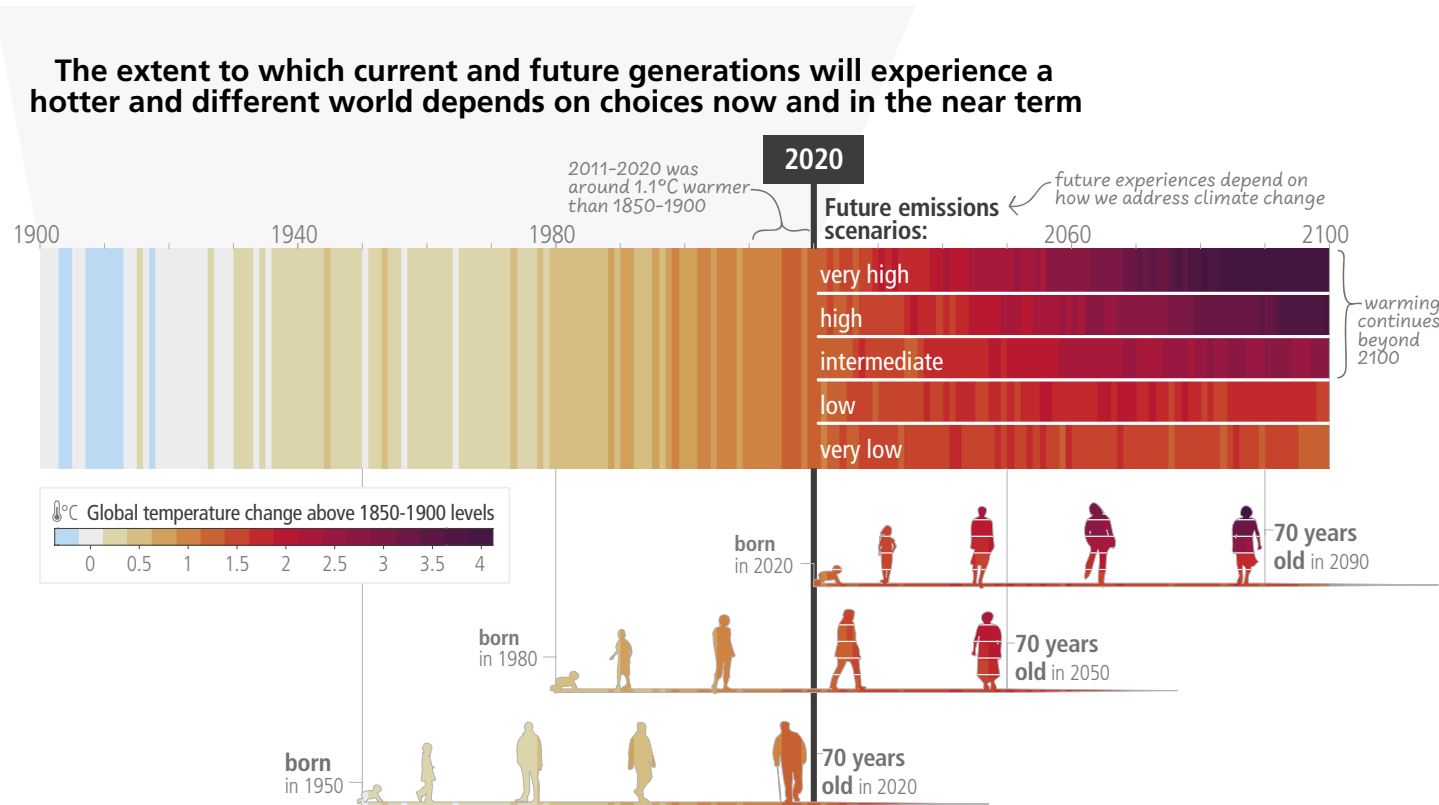
Failure to curb the warming effects of climate change has seen the rate of heat-related deaths surge

23%
since the 1990s, to **546,000**
a year.

The climate is changing, and without decisive action, global temperatures could rise by over 2°C before 2100

The Lancet Countdown Report 2025 World Health Organization Schematic on the extent to which current and future generations will experience a hotter and changing climate.

Note that the ‘intermediate’ scenario represents the current policy trajectory, with a global temperature of **~2.7°C by 2081–2100**.



Higher temperatures mean more frequent and more severe extreme weather events

World Resource Institute indicators	1.5°C Paris best case	2°C Paris agreement goal	3°C Current policy trajectory
Drought Population exposed to water stress, heat stress and desertification	0.95bn People	1.15bn People	1.29bn People
Food security Additional economic costs of adaptation and residual damage to major crops	\$63bn	\$80bn	\$128bn
Wild fires Increases in burnt area across Mediterranean Europe	40–54%	61–87%	96–187%
Extreme heat (global) Increase in days per year with maximum temperature above 35°C	45–58 Days	52–68 Days	66–87 Days
Extreme heat (South Africa) Increase in annual number of heatwaves in Southern Africa	2–4 x	4–8 x	8–12 x
Floods Increase in global population exposed to flooding	24%	30%	No data available

Not Exhaustive

~4 heatwave days per year during 1986–2005, doubled to 8-9 days in 2014–2023* and this has roughly doubled to 8–9 days in 2014–2023*

Note: (*)Heatwave days is a different metric measured against local climate, and so is not directly comparable – figures from the Lancet Countdown report Source: World Resources Institute / IPCC AR6 Working Group II Report (2022)

Deep-dive extreme heat:

Heat stress harms both physical and mental health, with effects that compound over time

Physiological impacts

Heat affects every major organ system with effects that compound over time:

- **Cardiovascular:** Heart rate and cardiac output rise sharply to support skin blood flow for cooling; increasing risk of heart attack, stroke and arrhythmia
- **Respiratory:** Heat exacerbates asthma, COPD and respiratory infections; combined with air pollution and wildfire smoke, increases hospital admissions
- **Neurological:** Heat stroke can cause confusion, seizures and loss of consciousness; chronic exposure impairs cognitive function, sleep quality and mental health
- **Renal:** Dehydration and reduced kidney perfusion drive acute kidney injury, with chronic occupational exposure linked to chronic kidney disease
- **An epidemic of chronic kidney disease** has been documented among Central American agricultural workers, which is thought to be due to repeated heat stress and dehydration. Similar patterns are now reported in heat-exposed agricultural workforces in South Asia

Mental health impacts

Mental health is consistently underrepresented in climate risk assessments, yet the workplace, healthcare and operational implications are significant

- **Sleep disruption:** Heat directly disrupts falling and staying asleep, poor sleep contributes to mood disturbance, impaired decision making and accidents
 - In 2023, the average person globally lost 6% more sleep hours due to heat exposure than they would have during 1986 to 2005₁
- **Aggression and conflict:** Higher temperatures are consistently associated with measurable increases in interpersonal aggression and workplace conflict
 - Each 1°C increase in ambient temperature is associated with a 1.64% rise in violence₂
- **Crisis demand:** Heatwaves drive spikes in hospital attendances and admissions for mental illness, placing strain on emergency services
 - Hospital attendances for mental illness rise by ~10% during heatwaves₃
- **Cognitive performance:** Heat reduces the brain's ability to process information, with implications for workplace safety, output quality and human error

Sources: WHO/WMO Joint Report on Occupational Heat Stress (2025), UKHSA Heat-Health Alerts; (1) Lancet Countdown on Health and Climate Change (2025), (2) Association of Rising Ambient Temperatures with Increased Violence Worldwide: Systematic Review and Meta-Analysis Sanchez Cruz et al., (2024) (3) Ambient temperature and mental health: a systematic review and meta-analysis, Thompson et al, Lancet Planetary Health (2023)

Deep-dive air pollution:

The fossil fuel combustion that drives climate change is also the largest environmental health risk

Drivers

- Burning fossil fuels for energy and transport is the **dominant source of both greenhouse gas emissions and fine particulate (PM2.5) air pollution** thereby contributing both indirectly and directly to climate-health risks
- Climate change independently worsens air quality. **Higher temperatures increase ground-level ozone, heat and drought drive wildfires**
- Wildfire smoke is a fast-growing, climate-amplified source. A record **154,000 deaths were attributed to wildfire smoke PM2.5 in 2024**, with fires fuelled by persistent drought and heat
- **"Super-pollutants" such as black carbon are both potent climate-warming agents and direct causes of cardiovascular and respiratory disease**; reducing emissions of them delivers outsized climate and health gains
- The burden is enormous and largely preventable:
 - **Fossil-fuel-derived outdoor air pollution caused an estimated 2.52m deaths in 2022**
 - Most of these deaths are avoidable through energy transition

Health impacts

- **Cardiovascular and respiratory disease:** PM2.5 particles travel deep into the lungs and enter the bloodstream, increasing the likelihood of heart attack, stroke, arrhythmia, asthma, COPD and respiratory infection
- **Cancer and long-term organ damage:** Air pollution is an established cause of lung cancer, with growing evidence linking chronic exposure to other cancers and to kidney and liver damage
- **Birth outcomes and child development:** Exposure in pregnancy is linked to preterm birth, low birth weight and stillbirth; children's developing lungs are particularly vulnerable
- **Cognitive decline and dementia:** A growing body of evidence links long-term air pollution exposure to accelerated cognitive decline and increased dementia risk
- **The UK is not exempt:** Air pollution caused an estimated 28,000 UK premature deaths in 2022, 55% of them attributable to fossil fuel burning

Sources: Lancet Countdown 2025

Climate change (and heat stress) does not affect everyone equally, vulnerability is influenced by several factors

Vulnerable group	Risk profile	Scale of impact (deep-dive hat)
 Older adults (65+)	• Reduced thermoregulation • Higher prevalence of cardiovascular and respiratory comorbidities • More likely to be on medications that impair heat response	Heat related mortality among adults 65+ increased ~85% globally from 2000-2004 to 2017-2021₁ A 1°C increase above optimal is associated with a 3.4% increase in cardiovascular mortality in people aged 65+ ₂
 Infants and young children	• Immature thermoregulation, vulnerable to heat related dehydration and gastrointestinal illness • Developing lungs are highly susceptible to air pollution, with long-term impacts on respiratory and cognitive development	Adults over 65 and infants under 1 year are now exposed to twice as many heatwave days as in 1986–2005 ₃
 Outdoor workers	• Sustained physical exertion in direct heat exposure, elevated exposure to air pollution • Contractual pressure (e.g. zero hours) may result in pressure to continue working in challenging conditions	640 billion potential labour hours lost globally to heat in 2024; 98% above the 1990s average₃ Income losses equivalent to \$1.09tr, ~1% of global GDP ₃
 Pregnant women	• Heat/air pollution exposure in pregnancy is linked to preterm birth, low birth weight, stillbirth, and other effects • Pregnant outdoor workers face compounding risk	Each 1°C increase in heat exposure raises the risk of preterm birth by 4%, rising by up to 26% during heatwaves₄
 People with chronic physical & mental illness	• Cardiovascular, respiratory, kidney, diabetes, and mental health conditions all worsen under heat stress and air pollution • Climate-related stressors (extreme events, displacement, prolonged heat) also worsen pre-existing mental health conditions	A 1°C increase in temperature is associated with a 2% increase in cardiovascular disease-related mortality₅
 Low-income and urban poor	• Higher exposure to urban heat island effects (less green space, dense housing, dark surfaces) • Poorer housing quality with limited cooling • Lower access to healthcare, fewer resources to adapt	Disadvantaged populations experience 26–45% higher heat-related mortality risk and 3–4°C greater heat exposure than affluent communities, even after controlling for income ₆
Compounding Risk Vulnerabilities do not always exist in isolation; they have a compounding effect. An elderly person with chronic illness in a poorly insulated urban flat faces risk that is the multiple of each factor. These populations are also the least likely to have the resources to adapt.		

“Each 1°C increase in heat exposure raises the risk of preterm birth by 4%, rising by up to 26% during heatwaves.”

Climate change (and heat stress) does not affect everyone equally



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