

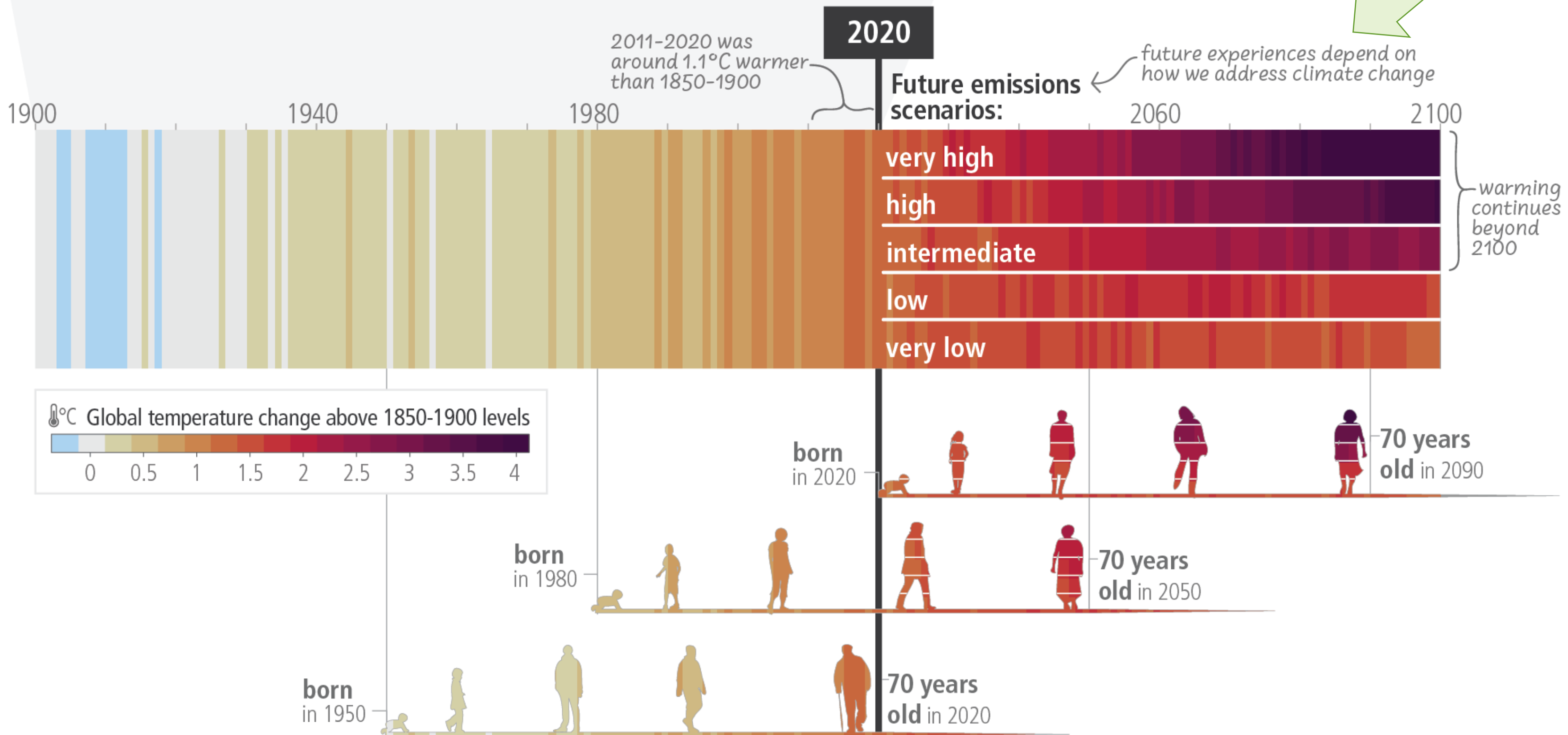


Advancing Sustainable Health Research

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c) The extent to which current and future generations will experience a hotter and different world depends on choices now and in the near-term



Why sustainable health research?

Climate change is one of the greatest health challenges today

Health research contributes to climate change:

- **Labs are resource intensive:** One scientist in a bioscience lab generates c.1 ton of plastic waste per year¹
- **So is clinical research:** estimated to be responsible for 100 million tonnes of CO₂e emissions each year² ≈ one-third of the UK's annual emissions in 2021³.
- **And computational research:** GPT-3 produced 552 tons of CO₂e to train⁴ - equivalent to roughly 308 direct flights from London to Sydney⁵.

¹ Urbina, M.A., A.J.R. Watts and E.E. Reardon. 2015. 'Labs Should Cut Plastic Waste Too.' Nature 528(7583): 479–479.

² Sustainable Healthcare Coalition, <https://shcoalition.org/clinical-trials/>

³ <https://ourworldindata.org/co2/country/united-kingdom>

⁴ Patterson, David; Gonzalez, Joseph; Hölzle, Urs; Le, Quoc Hung; Liang, Chen; Munguia, Lluís-Miquel; et al. (2022). The Carbon Footprint of Machine Learning Training Will Plateau, Then Shrink. TechRxiv. Preprint. <https://doi.org/10.36227/techrxiv.19139645.v4>

⁵ <https://travelnav.com/emissions-from-london-united-kingdom-to-sydney-australia>

Advancing environmentally sustainable research

- **What initiatives exist that can address the environmental sustainability of health research?**
 - Measure the impact
 - Reduce the impact
- **What are the challenges in implementing them?**
- **What are the implications for researchers, research institutions and research funders?**



Desk research



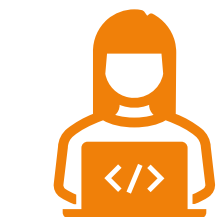
Crowdsourcing



Case studies



Interviews

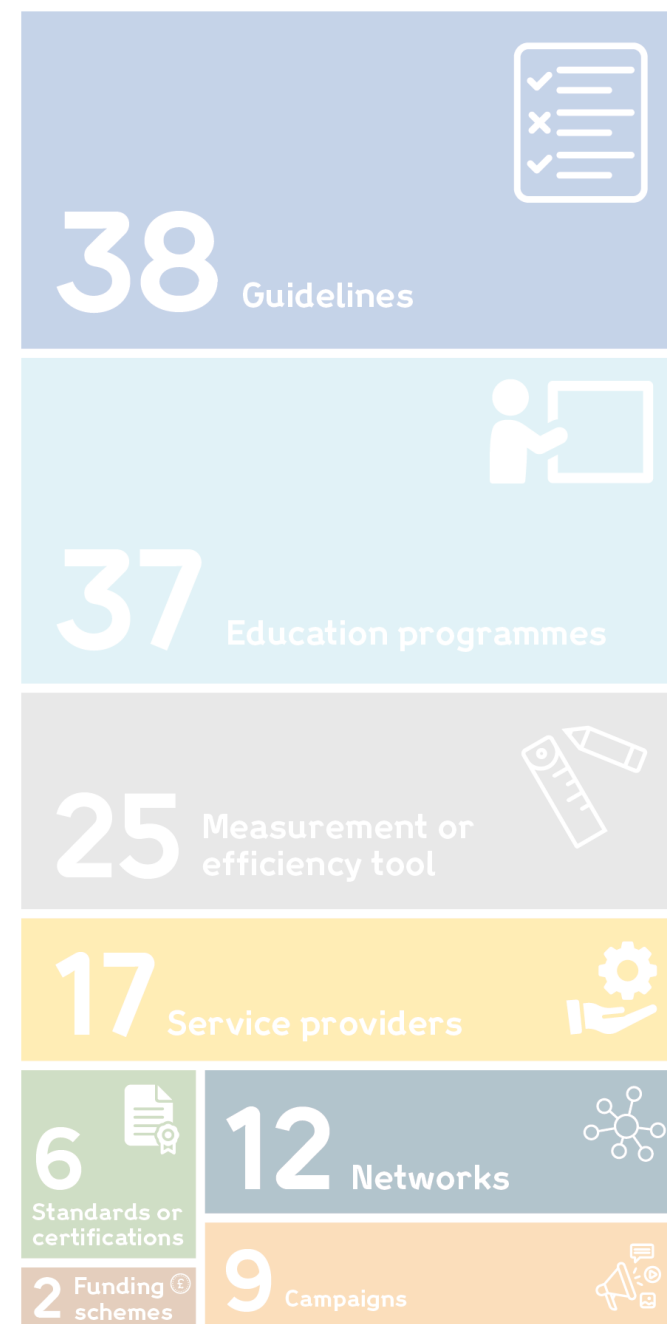


**Focus groups
and workshops**

Initiatives identified

Total of 146 interventions identified across 8 categories

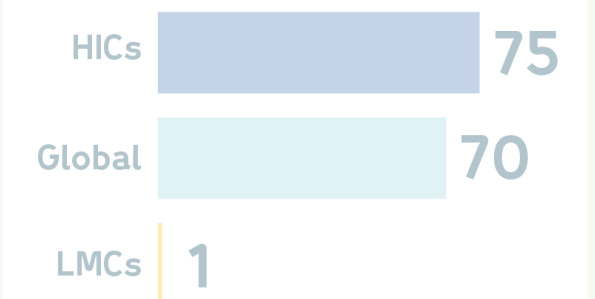
Number of initiatives per category



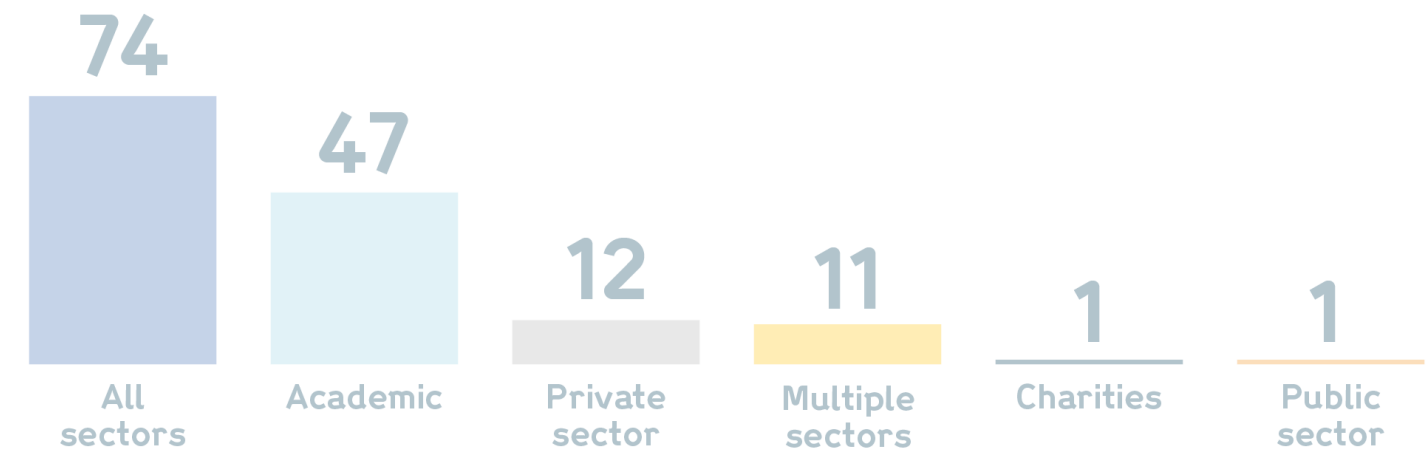
Number of initiatives identified per health research type



Geographical distribution of the initiatives identified



Sectoral distribution of interventions identified



Number of initiatives that have undergone assessments



Gaps in existing initiatives

- Very few initiatives address clinical settings and qualitative research
- Most can only be used in high-income countries. The remaining, barring one, have the potential to be used globally (e.g. available online). Only one has been designed for LMICs.
- Limited high-quality evidence of impact
- None have been mandated by funders within their eligibility requirements

Need for more fundamental research:

- How to measure carbon emissions
- Largest origins of carbon emissions across the health system
- Sustainability of research equipment and practices



Challenges in implementation

At an individual level

- Limited capacity of researchers
- Lack of funding
- Lack of training on sustainability issues and assessment
- No comprehensive repositories of information exist
- No mechanism for easy sharing of knowledge and good practice between actors
- Need to engage technicians who have relevant expertise

At a system-level

- Coordination needed to limit profusion of different standards and requirements
- Need for international cooperation given increasingly global nature of health research
- Equity to be considered to ensure institutions with fewer resources can participate effectively in initiatives

The good news

Many sustainability considerations are aligned with other priority areas:

- Reproducibility and open research
- Supportive positive and inclusive research cultures
- Equitable research
- Trustworthy data and digital technologies

Overwhelming support from grantees.

Sustainability needs to be considered a core part of conducting high-quality, ethical research



Next steps

Funding opportunities

- Exploring how best support this growing space – addressing some of the key gaps identified within our report.

Supporting sustainable research practices amongst grantees

- Incorporate sustainability into planned funding activities
- Support grantees already doing the work, and encourage more of it

Environmental sustainability policy for grant holders

- UKRI Environmental Sustainability in Research and Innovation Concordat
- Open access & data sharing policy
- Policy launch in early 2024

Keep up-to-date with our policy

