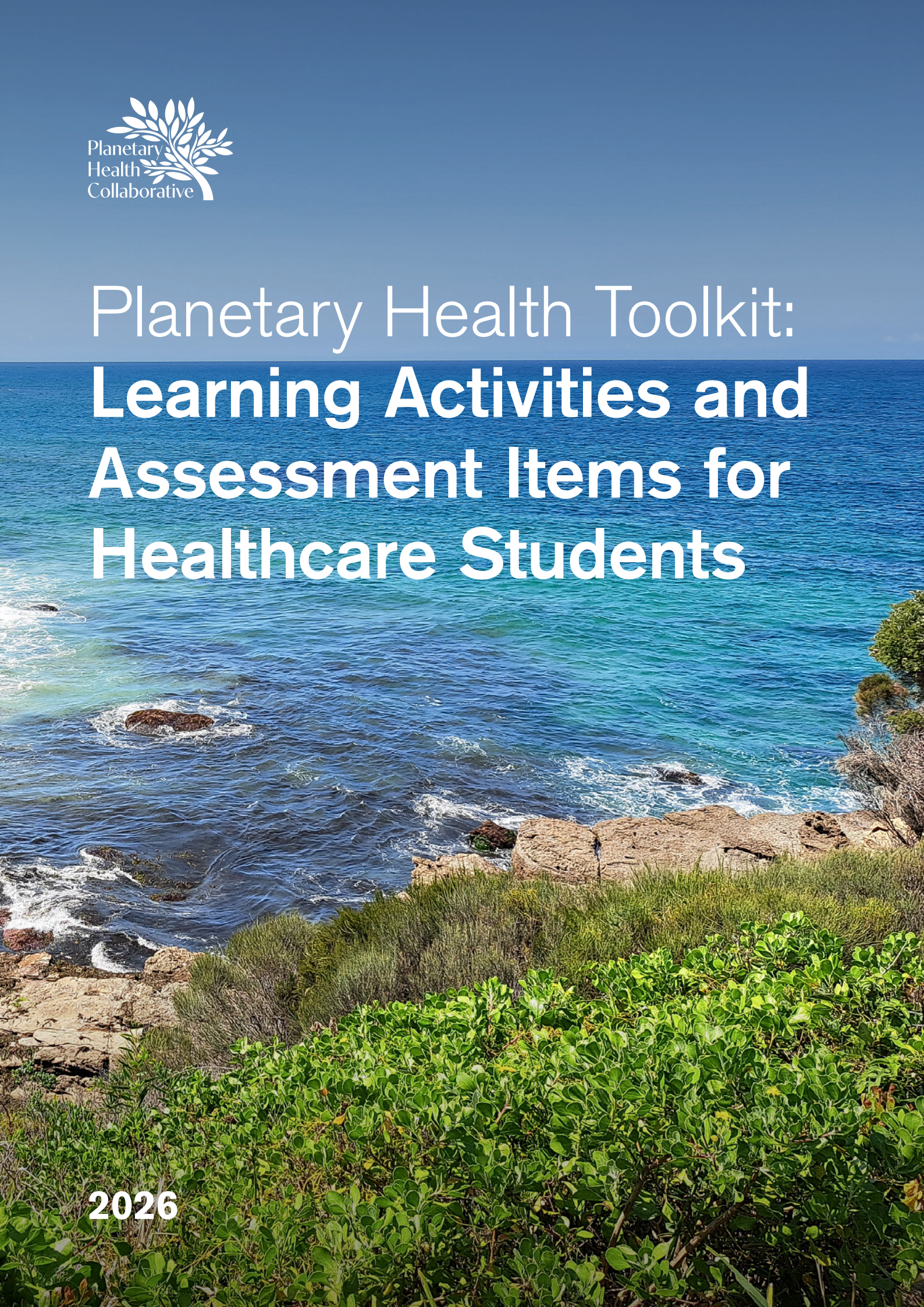
Planetary Health Collaborative

# Planetary Health Toolkit: **Learning Activities and Assessment Items for Healthcare Students**



2026

## Authors

This toolkit provides a range of planetary health assessment items and teaching and learning activities for use in healthcare programs. The project to develop the toolkit was undertaken in 2025 by members of the Planetary Health Collaborative for Nurses and Midwives. The project was led by Distinguished Professor Tracy Levett-Jones from the University of Technology Sydney.

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## Enquiries

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## Feedback

We welcome feedback about this toolkit, including its use and effectiveness, educator and student perceptions, suggestions for improvement and for future iterations.

Please access this QR code to provide feedback.

## Acknowledgement

We acknowledge the Traditional Owners of Country throughout Australia, and their continuing connection to land, sea and community. We pay our respects to them and their cultures, and to Elders both past and present.

# Contents

# About

## About the Author Team

The Planetary Health Toolkit was developed by 23 academics representing 13 universities. Each are members of the Planetary Health Collaborative for Nurses & Midwives. We are a group of researchers and educators who are deeply committed to creating a healthier and more equitable world for current and future generations by addressing the challenges associated with planetary health.

Our aim in developing the toolkit is to catalyse transformative change in higher education so that healthcare graduates will be equipped with the skills and knowledge needed to safeguard the health of the planet, now and into the future.

## About the toolkit

The impact of climate change on global health is undeniable and as extreme weather events escalate, healthcare systems face growing pressures. The direct health implications are substantial, encompassing not only immediate injuries and fatalities but also long-term psychological, physical, and social health consequences. Extreme weather events have also revealed critical vulnerabilities in health emergency responses and infrastructure resilience.

At the heart of these challenges lies the broader imperative of planetary health—the recognition that human health is inseparable from the health of the Earth's natural systems. Climate change, biodiversity loss, and environmental degradation are interconnected threats that demand integrated, sustainable, and justice-oriented responses.

Healthcare professionals play a crucial role, not only in emergency responses, but also in driving health system mitigation and adaptation to climate change and pollution. Their understanding of how healthcare contributes to environmental degradation and their frontline experiences in addressing the health outcomes of climate-driven disasters position them to contribute meaningfully to resilience-building and planetary health strategies.

Across the world, healthcare organisations have called upon educators to prepare a workforce capable of practising in a more sustainable, equitable, and environmentally responsible way. Yet, many educators report a lack of confidence to integrate these complex and interdependent concepts into their teaching and student assessment. This toolkit has been designed to address this issue. It brings together a set of structured learning and teaching activities and assessment items aimed at strengthening healthcare students' knowledge, skills and leadership in planetary health. Each activity reflects contemporary evidence and provides a practical way of connecting theory to action.

The Planetary Health, Climate Change and Sustainable Healthcare: Essential Knowledge and Skills Framework has been used as a pedagogical scaffold in the toolkit with the aim of supporting curricula integration. Through engagement with the activities and assessment items, learners will be encouraged to explore the health impacts of climate and environmental change, develop their understanding of planetary health, mitigation and adaptation, practise communication, discharge planning and advocacy skills, and design solutions that build system resilience and sustainability.

The activities can be used in flexible and creative ways across undergraduate and postgraduate programs. Many of the learning and teaching activities can be adapted into assessment items—and similarly, many of the assessment items can be used as teaching activities—to promote deep learning and authentic engagement with the principles of planetary health.

We hope this toolkit will help you to develop confident, future-focused leaders who can shape healthcare in our changing world.

**– The Author Team**

"The future of healthcare depends on the health of our planet. Teaching planetary health is teaching hope, responsibility and survival."

# Planetary Health Assessment Activities

# Planetary Health Communique


## Learning designers

Dr Liza Barbour, Monash University
Dr Julia McCartan, Monash University


## Rationale

In order to influence systemic change to address complex challenges and promote planetary health, healthcare professionals are required to translate their scientific knowledge to a number of different audiences. Media provides an effective platform to reach large groups of people; however the fast-moving media industry requires healthcare professionals to have particular communication skills.

A communique is an official statement or announcement used to convey information to a broad audience. This assessment activity provides students with an opportunity to write a communique on a planetary health topic. Emulating real-world practice, students will have access to generative Artificial Intelligence (AI) to inform their writing.

Students will write their communique as if it were for publication in The Conversation (Australia), the world's leading publisher of research-based news and analysis. This media platform is unique in that it is a collaboration between academics and journalists, and the focus is on turning evidence-informed knowledge and insights into easy-to-read articles for an educated audience.

## Learning objectives

**Completion of this activity will allow learners to:**

- Prepare a succinct written response to address a topical, planetary health challenge.
- Utilise generative AI to prepare an initial article, followed by a critique of the work produced.
- Draw from high-quality sources of scientific evidence, to write a news-worthy, nuanced and compelling story for an educated audience.

**Note:** Educators may decide to narrow the topic to a particular discipline, for example, 'Prepare a succinct written response to address a topical, food-related, planetary health challenge'.

"The ultimate goal of education is not just knowledge, but wisdom—wisdom to live well within the limits of our planet."

**— Adapted from David Orr**

## Process

Students should be given a list of topics related to planetary health challenges. **Examples may include:**

- Climate anxiety and its impact on young people
- Gender justice in planetary health
- The impact of extreme heat for people with insecure housing
- Climate migration caused by extreme weather events.

**Students are then instructed to:**

1. Select one of the topics and use Generative AI to produce an 800-word article intended for publication in The Conversation. This AI-generated article is to be included as an appendix when submitting the assessment item. Students should also copy, paste and save all of the prompts/commands used to create this article as these will form part of the Statement Acknowledging the use of AI.
2. Students then draft a 500-word critique of the AI generated article, drawing upon evidence-based sources.
3. Students write a revised version of the 800-word article to accurately reflect and incorporate contemporary, appropriate evidence on the topic and to meet The Conversation guidelines (see the resources below). Importantly, the article must provide a nuanced perspective on the topic that draws upon a wide range of evidence. Students will also be assessed on the originality of this final article, in comparison to the AI generated article. **Note:** The use of AI to prepare this human-written version is *not permitted.*
4. Students complete the final version of the 500-word critique they previously drafted by comparing the AI-generated article to the revised human-created article, stipulating which content was revised and why. **Note:** The use of AI to prepare this critique is *not permitted.*
5. The assessment items submission should include each of these components:
    a. 800-word final and re-written Conversation article
    b. 500-word critique
    c. Reference list
    d. Statement outlining the use of Generative AI
    e. An appendix that includes the AI-generated Conversation article that the critique was based on and the prompt(s) used to create this version of the article.

# Planetary Health Communique

## Resources

These resources will help students prepare for this assessment task. They provide information about the type of writing style required when preparing the critique and revised article. Please note that authors usually have to first submit a 'pitch' to The Conversation, and once their idea has passed this initial pitch process, they are invited to prepare a full article. For this assignment, students are skipping this pitch process.

- How to Pitch to The Conversation
- University of Queensland's Author Guide for The Conversation (Skip the 'pitching' advice and focus on page 3 and beyond).

### Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 1:** ***The science of planetary health and climate change***

- Explains the interdependence of human health and the health of the environment.
- Communicates effectively with various stakeholders, including colleagues, healthcare consumers and policy makers, about the consequences of climate change for human health, in order to promote informed decision making.
- Disseminates scientific evidence related to planetary health and climate change

**Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***

- Uses risk communication strategies to advocate for proactive action to address the impacts of climate change

**Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***

- Provides evidence-based information and education to healthcare consumers and colleagues about preparing for, responding to, and recovering from the effects of climate change

# Media Reporting of Climate Change and Health Impacts


## Learning designers

Distinguished Professor Tracy Levett-Jones,
University of Technology Sydney

Dr Aletha Ward, University of Queensland


## Rationale

Understanding the role of the media in framing and communicating climate change is critical, especially in the light of public's reliance on media sources for information about health risks associated with environmental changes. Both print and online media shape public perception, influence attitudes, and potentially impact behaviours towards climate change and health issues. Media coverage also plays a critical role in policy discourse and influencing policymakers' agendas. However, the rise of misinformation and disinformation, along with the political leanings and biases of media outlets, can distort the public's understanding and downplay the scientific consensus on the impact of climate change on health. Healthcare student must be able to critically examine media reports for accuracy and credibility.

## Learning objectives

**Completion of this assessment activity will allow learners to:**

- Critically examine how print and online media represents (or misrepresents) climate change and its health impacts.
- Reflect on the role of the media in promoting informed, accurate public perceptions and policy decisions related to climate change and its health impacts.

## Process

Learners are to source one media report focused on climate change and related health impacts and, using the rating scale provided in Appendix 1, (a) critique the quality and accuracy of the content; and (b) reflect on potential implications.

Learners can present their critical review, synthesis and reflection as an individual assessment activity in a written report or infographic (see example in Appendix 2) or, alternatively, aggregate the critiques of 4-5 media sources and report the results and implications in group-based presentations.

## Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 1:** ***The science of planetary health and climate change***

- Communicates effectively with various stakeholders, including colleagues, healthcare consumers and policy makers, about the consequences of climate change for human health, in order to promote informed decision making.
- Disseminates scientific evidence related to planetary health and climate change.

**Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***

- Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security and safe housing, especially for priority populations.

# Op-Ed for Change: Amplifying Local Voices for Global Impact

## Learning designer

Belynda Abbott, University of Canberra

## Rationale

Climate change is not only an environmental crisis, but also a health emergency. Rising temperatures, extreme weather events, air pollution, and biodiversity loss are already impacting the physical and mental health of individuals across Australia and the World.

This assessment activity will allow healthcare students to examine national political commitments through the lens of planetary health, recognising the importance of the interconnectedness of human health and the health of natural systems. By writing an Op-Ed suitable for a local newspaper, students will explore how climate action can protect communities, reduce health disparities and create a more sustainable future. They will develop the critical thinking, persuasive communication and literacy skills essential for future healthcare professionals, policymakers and changemakers.

An Op-Ed (short for Opposite the Editorial) is a written opinion piece for publication in a newspaper or online media outlet. Unlike news articles, which aim to report facts objectively, Op-Eds express the author's personal viewpoint on a current issue. They are typically written by community members or concerned individuals and are designed to persuade, inform, or provoke thought amongst the public.

Op-Eds are powerful tools for community engagement. They allow individuals to contribute to public discourse, influence policy, and raise awareness about pressing social environmental or health issues. A well-crafted Op-Ed combines evidence, emotion and clear argumentation to make a compelling case for action or change. It empowers the author to link environmental sustainability and human wellbeing through voice, health advocacy, and real-world relevance.

## Learning objectives

**Completion of this assessment activity will allow learners to:**

- Compose a persuasive Op-Ed that communicates the urgency of climate action from a health and sustainability perspective.
- Explain the concept of planetary health and its relevance to climate change and human wellbeing.
- Analyse the health implications of Australia's climate commitments, including emissions reduction and renewable energy expansion.
- Evaluate the role of healthcare professionals and the public in advocating for climate action and environmental justice.
- Reflect on how environmental policies can promote health equity and resilience in local communities.

## Process

Learners are to access and reflect on the Australian Prime Minister's national statement from the United Nations General Assembly (24 September 2025), identifying key discussion themes that relates to climate change and human wellbeing.

Learners will then write a persuasive 600–800-word Op-Ed that:

- expresses a clear opinion on Australia's climate commitments using plain language, emotional appeal and evidence.
- connects climate action to health outcomes and planetary wellbeing.
- offers a call to action or recommendations based on examples from their own region or community and supported by local health/climate data.

## Assessment

This activity can be used as the basis for an individual formative or summative assessment and can be either a written piece or a verbal presentation.

# Op-Ed for Change: Amplifying Local Voices for Global Impact

| Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework | |
|---|---|
|  | **Domain 1:** ***The science of planetary health and climate change***<br>▪ Explains the interdependence of human health and the health of the environment.<br>▪ Describes how human activities, including use of fossil fuels, are exacerbating climate change.<br>▪ Outlines the contribution of the healthcare system to greenhouse gas emissions.<br>▪ Explains how and why socioeconomically disadvantaged and marginalised communities locally, nationally and internationally, are most impacted by climate change. |
|  | **Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***<br>▪ Discusses the environmental impact of healthcare delivery and nursing practice.<br>▪ Explains the relevance of Net Zero plans to the work of nurses.<br>▪ Provides examples of direct and indirect health co-benefits of mitigation measures.<br>▪ Discusses personal, interpersonal, organisational and political enablers and barriers to nurses' sustainable behaviours.<br>▪ Discusses the roles of nurses as change agents and advocates for environmentally sustainable healthcare practices.<br>▪ Describes local healthcare initiatives for reducing greenhouse gas emissions and their impact. |
|  | **Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***<br>▪ Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security and safe housing, especially for priority populations.<br>▪ Explains the interconnected nature of climate change adaption measures and the UN Sustainable Development Goals.<br>▪ Discusses how healthcare settings can adapt models of care and resourcing to manage climate-driven disasters. |

# Planetary Health Blogs for Priority Populations

## Learning designer

James Bonnamy, Monash University

## Rationale

There is a clear mandate to include planetary health in health professional education. Planetary health is connected to every human organ system and touches on professionalism, social accountability, ethics and advocacy, which are core health professional constructs. Health professionals are considered trustworthy members of society and their influence, combined with their knowledge of health and wellbeing, puts them in a position of privilege and makes them ethically obliged to advocate for the right to a healthy planet and future. Healthcare graduates must be able contribute to global climate action and prepared for the inevitable climate-related repercussions on health.

There is increasing recognition of the climate-related health and wellbeing impacts for priority populations – those at greatest risk of harm due to planetary health deterioration. Priority populations include, for example, older people, children, people with chronic physical or mental health conditions, those with disabilities, and people experiencing socioeconomic disadvantage, such as low-income households and people who are homeless and marginalised. Also at higher risk are Indigenous communities, rural communities, pregnant women, and displaced people. Priority populations face heightened threats from heatwaves, floods, air pollution, and extreme weather events. Concerningly, many people belong to multiple priority groups, such as elderly people who have a low-income and unstable housing.

Blogs enhance student learning by providing a creative, reflective, and social platform for expressing ideas, constructing knowledge, and engaging with academics and peers. Blogs can foster a sense of ownership, autonomy, and academic and digital literacy. Blogs are also a creative method for highlighting the interconnectedness of human and planetary wellbeing. For example, they can be used to explain the health impacts of climate change and share actionable steps for a healthier planet. Blogs are easily shared across professional and social media platforms to encourage discussion and collaboration.

## Learning objectives

**Completion of this assessment activity will allow learners to:**

- Identify a priority population at risk of planetary health deterioration.
- Explain the health and wellbeing impacts of planetary health deterioration on the selected priority population.
- Summarise the role of healthcare professionals in addressing planetary health deterioration repercussions for the priority population.
- Propose local and systemic strategies to mitigate planetary health deterioration repercussions for the selected priority population.

**Example blog (excerpt):**

**"Store in a cool dry place: Why medications don't keep well on the streets"**

People who are homeless and vulnerable are at increased risk of the health and wellbeing repercussions of planetary health changes, especially extreme temperatures. One particular challenge for people who are homeless is the safe storage of medications during periods of extreme heat and cold. This blog outlines the challenges people who are homeless face in storing their medications safely. It identifies common medications that are sensitive to temperature extremes (e.g. cephalexin capsules and salbutamol inhalers), suggests practical strategies to increase medication safety (e.g. opting for the shortest course of treatment), and advocates for social change to support people who are homeless to safely store their medications.


**Store in a cool dry place: Why medications don't keep well on the streets**

by James Bonnamy / 8 May 2025

The World Meteorological Society (2025) confirmed 2024 as the warmest year on record at about 1.55oc above pre-industrial levels. Our climate is shifting, and this presents a fundamental threat to... Read More »

# Planetary Health Blogs for Priority Populations

## Process

- Select a blog tool or platform to host and archive student blogs e.g., WordPress, Blogger or edublogs. Alternatively, the blogs can be uploaded to a Learning Management System.
- Determine whether learners are to write the blogs as individuals or working in pairs.
- Learners can be directed to write a single blog that addresses each of the learning outcomes or a series of linked blogs written over a specified period of time on the selected topic.
- Maximise active participation by providing examples of blogs and advice on writing blogs.
- Clearly articulate expectations about the number of blogs, reviews and comments that each learner needs to provide.
- Encourage peer review and feedback by providing example questions, statements, and content e.g. 'Can you explain how you identified the health impacts discussed?'

## Assessment

The blogs can form a formative or summative assessment activity and be evaluated by educators or peers. See example rubric in Appendix 3.

## Further information

O'Rourke, M., Doyon, A. Rethinking assessment strategies to improve authentic representations of learning: using blogs as a creative assessment alternative to develop professional skills. 21, 49 (2024). doi.org/10.1186/s41239-024-00483-0

## Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 1:** ***The science of planetary health and climate change***

- Explains the interdependence of human health and the health of the environment.
- Describes how human activities, including use of fossil fuels, are exacerbating climate change.
- Explains how and why socioeconomically disadvantaged and marginalised communities locally, nationally and internationally, are most impacted by climate change.
- Discusses how First Nations peoples' connection with Country, cultural knowledges, land management and conservation practices, inform the agenda for a sustainable future.

**Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***

- Discusses the roles of nurses as change agents and advocates for environmentally sustainable healthcare practices.
- Explains how nurses uphold the ethical principles of beneficence, nonmaleficence, autonomy and justice by practicing in an environmentally sustainable manner.

**Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***

- Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security and safe housing, especially for priority populations.
- Describes strategies nurses can use to support individuals and groups most at risk of climate impacts (such as air pollution, extreme temperatures, floods and fires), with particular attention to frail and elderly people, young children, pregnant women and those with pre-existing co-morbidities and/or disabilities.
- Describes the health impacts of climate change on cardiovascular, respiratory, renal, gastrointestinal, neurological, integumentary, endocrine and reproductive systems across the lifespan.
- Outlines potential psychological responses and mental health impacts of climate change, including anxiety and stress.

# Interactive Oral Assessment: Climate Challenge – Carbon Literacy Course

## Learning designer

Dr Lorraine Fields, University of Wollongong

## Rationale

Climate change is one of the most pressing challenges facing human health and healthcare systems globally. Healthcare professionals have a critical role in understanding the science, impacts, and solutions to climate change and in applying this knowledge to clinical practice, patient education, and advocacy.

The Climate Challenge course provides learners with foundational climate literacy, including the causes, consequences, and solutions to climate change, as well as strategies to critically evaluate misinformation. The linked assessment will enable learners to consolidate their understanding of climate science, explore the implications for human health and healthcare practice, and demonstrate their ability to communicate their knowledge effectively in an interactive oral format.

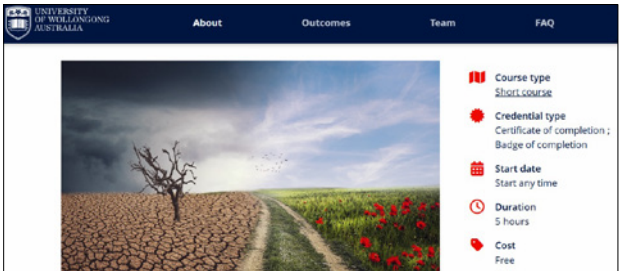
## Learning objectives

**Completion of this activity will allow learners to:**

- Demonstrate foundational climate literacy, including the causes, consequences, and solutions of climate change.
- Describe the role of climate change in impacting human health and healthcare systems.
- Analyse and reflect on the implications of climate change for clinical practice.
- Demonstrate professional communication skills in presenting knowledge orally and responding to questions.
- Apply critical thinking to discuss how climate literacy informs evidence-based healthcare decisions and advocacy.

## Process

1. Completion of the Online Course:
   - Learners will complete the Climate Challenge online course via OpenLearning.
   - The course takes approximately 5 hours to complete and can be undertaken at the learners' own pace.
   - Learners will be provided with a course certificate which must be submitted as evidence of completion.




## Assessment

2. Interactive oral assessment: Each learner will participate in a 10-15-minute oral assessment with a tutor during which they are expected to demonstrate understanding of course content and apply it to healthcare practice, including:
   - Key concepts in climate change science and solutions.
   - Impacts of climate change on health, healthcare systems, and vulnerable populations.
   - Relevance and application to healthcare practice and patient care.
   - Reflections on personal and professional roles in climate action.

**Note:** The marking criteria for the oral assessment is provided in Appendix 4.

## Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 1:** ***The science of planetary health and climate change***

- Discusses the meaning of planetary health, climate change, and related terms.
- Explains the interdependence of human health and the health of the environment.
- Describes, in simple terms, the basic scientific principles of climate change.
- Describes how human activities, including use of fossil fuels, are exacerbating climate change.

**Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***

- Discusses the meaning of mitigation of climate change and related terms.
- Discusses the roles of nurses as change agents and advocates for environmentally sustainable healthcare practices.

# Net Zero Inservice Presentation

## Learning designer

Dr Lorraine Fields, University of Wollongong

## Rationale

Healthcare is both impacted by and contributes to climate change and environmental degradation. Net Zero plans or roadmaps are strategic documents that detail the specific steps, timelines, and necessary investments an organisation must take to achieve net zero greenhouse gas emissions by a target date. These roadmaps outline pathways to reduce emissions, implement clean technologies, improve energy efficiency, and, if needed, offset any residual emissions to meet their climate goals and secure a sustainable future.

Frontline healthcare staff play a pivotal role in educating peers, fostering awareness, and leading initiatives that align clinical practice with environmental responsibility. However, many staff remain resistant to change or have limited knowledge about the concept of net zero roadmaps or the broader health consequences of unsustainable environments.

This assessment enables learners to take on the role of an educator and practice effective communication, advocacy, and leadership skills by delivering an in-service presentation to colleagues.

## Learning objectives

**Completion of this activity will allow learners to:**

- Explain the health consequences of unsustainable environments (e.g. climate change, air and water pollution).
- Describe the meaning and importance of achieving 'net zero'.
- Critically examine and communicate priority areas in a healthcare organisation's roadmap or strategic plan.
- Design and present a feasible ward-level initiative that promotes sustainability and reduces environmental impact.
- Demonstrate professional communication skills and present information in a clear, evidence-based manner.

## Process

In this activity and linked assessment learners will:

1. Familiarise themselves with a healthcare net zero roadmap or strategic plan such as the NSW Health Net Zero Roadmap.
   **Note:** Students located in other states should access a relevant net zero roadmap from their own department of health.
2. Conduct research into the impacts of unsustainable environments on health and healthcare, and the significance of achieving 'net zero'.
3. Select one priority area from the roadmap (for example, clinical care, land and building design, energy and water, supply chain, travel and transport, food services).
4. Prepare a concise in-service education session (presentation) of the type that could be presented to clinical colleagues, addressing:
   - an overview of health consequences from unsustainable environments.
   - an explanation of what 'net zero' means.
   - an in-depth exploration of the chosen priority area and its relevance to sustainable healthcare practice.
   - a practical and feasible ward initiative - either based on an existing practice or a proposed idea - that aligns with the chosen priority area. The initiative should include clearly defined objectives, strategies for implementation, and anticipated outcomes.

## Assessment

Students' in-service presentations can be recorded and submitted for marking or they can be presented in class. See Appendix 5 for a suggested marking criteria.

## Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 1:** ***The science of planetary health and climate change***

- Communicates effectively with various stakeholders, including colleagues, healthcare consumers and policy makers, about the consequences of climate change for human health, in order to promote informed decision making.

**Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***

- Explains the relevance of Net Zero plans to the work of nurses.
- Describes local healthcare initiatives for reducing greenhouse gas emissions and their impact.

# Health in the Balance: A Podcast on Planetary Impacts

## Learning designer

Anna Foster, Southern Cross University

## Rationale

Planetary health recognises that human health is deeply interconnected with the health of the environment. Climate change, environmental degradation, and unsustainable healthcare practices are creating significant challenges for communities worldwide, disproportionately affecting vulnerable populations (Romanello et al., 2023).

Topics such as climate change, air pollution and food insecurity are crucial for future health practitioners to understand, as they influence disease patterns, healthcare delivery, and community well-being (Barna et al., 2020). Healthcare professionals must be equipped to respond to climate change, biodiversity loss and pollution impacts and also advocate for sustainable and equitable solutions.

This podcast activity will allow learners to research and communicate complex issues in an engaging manner. Podcasts not only foster creativity and communication skills; they also allows students to develop a clear narrative related to real-world health challenges (Kelly et al., 2022).

In this activity and the linked assessment, students will explore real-world planetary health issues, critically analyse their health impacts, and communicate evidence-based strategies for adaptation and mitigation. By engaging with scientific evidence, case studies, and advocacy approaches, students will develop the knowledge, skills, and awareness needed to respond to the health challenges of a changing planet.

## Learning objectives

**Completion of this activity will allow learners to:**

- Develop and present a clear, engaging podcast that explains complex planetary health issues to a non-expert audience, using accessible language, examples and creative communication strategies.
- Identify and address environmental factors that influence individual health outcomes and care plans.
- Critically evaluate the impact of planetary health issues on populations and healthcare systems by analysing evidence from multiple sources, and assess the significance of these impacts for healthcare practice, policy and sustainability.

> "The ultimate test of a moral society is the kind of world that it leaves to its children."
>
> **— Dietrich Bonhoeffer**

## Process

This activity is undertaken in pairs or groups of three learners.

Students will create an 8–10-minute podcast episode exploring and critically analysing a planetary health issue.

Students are to adopt a conversational tone in their podcast to promote engagement and accessibility. Groups may wish to assign roles—such as topic expert, case study participant, and interviewer—to structure the podcast. Alternatively, group members may engage in a collaborative, dialogue-based exploration of the subject with all group member contributing.

1. **Topic Selection:**
   Students select one of the following topics for their podcast:
   - Heatwaves and vulnerable adults
   - Bushfire smoke and respiratory health
   - Flooding and waterborne diseases
   - Air pollution and cardiovascular or respiratory disease
   - Food insecurity and nutrition
   - Mosquito-borne disease spread
   - Pharmaceutical waste
   - Single-use plastics in healthcare
   - Mental health impacts of climate change
   - Eco-anxiety and societal responses
   - Asthma and the impact of storms

2. **Podcast structure:**
   **Introduction (1 minute):** Students introduce their identified topic and explain its significance to human, environmental and planetary health.

   **Main discussion and links to vulnerable populations (3 minutes):** Students:
   - Briefly explain the scientific background of the issue.
   - Discuss their analysis of the implications of the issue for health, ideally with both local and global examples, to demonstrate how the issues manifest in different contexts.
   - Outline how specific health conditions are related to various planetary health concerns (for example, respiratory diseases from air pollution, waterborne diseases from floods).
   - Highlight how certain populations, such as low-income communities, children, older people, or marginalised groups, are disproportionately impacted by the issue.
   - Explain the concept of climate justice and if/why vulnerable groups are at greater risk.

   **Case Study (2 minutes):** Students present a brief but relevant case study/story that illustrates the topic's impact on health. This could include real-world examples such as the health impacts of extreme weather events, air pollution in specific cities, or how particular communities are affected by biodiversity loss.

   **Recommendations and Advocacy (2 minutes):** Students:
   - Propose practical strategies for individuals, communities or healthcare systems to respond to the issue.
   - Discuss the role of healthcare professionals in advocacy and mitigating the impacts of the issue.

# Health in the Balance: A Podcast on Planetary Impacts

## Process

3. **Engagement and Audience:**
   - The podcast should engage a broad, non-expert audience, using clear and accessible language while still communicating a thorough understanding of the issue.
   - Students are encouraged to illustrate ideas using storytelling techniques, with concrete examples that bring the topic to life.
4. **References and Evidence:**
   - Students are to locate, interpret and cite at least 5 scholarly sources in their podcast, ensuring evidence-based discussion.
   - Sources are to cite using APA 7th edition format and provide as a separate reference list.
5. **Sharing podcasts**
   - Students record and upload their podcast to their university learning management system.
   - Students should then listen to and comment on a specified number of their peers' podcasts in order to develop a growing understanding of the topic and to foster collaborative learning.

## Assessment

This activity can be used as a formative or summative assessment. However, individual components (e.g., topic selection, case study development, and recommendations) could be introduced and worked on throughout subsequent tutorials with opportunities for formative feedback provided in preparation for the final submission.

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## Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 1:** ***The science of planetary health and climate change***

- Explains the interdependence of human health and the health of the environment.
- Outlines the impact of climate change on environmental disasters such as extreme weather, droughts, floods, fires, dust storms, extreme heat and sea level rises, locally, nationally and internationally.
- Explains how and why socioeconomically disadvantaged and marginalised communities locally, nationally and internationally, are most impacted by climate change.
- Discusses how First Nations peoples' connection with Country, cultural knowledges, land management and conservation practices, inform the agenda for a sustainable future.

**Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***

- Provides examples of direct and indirect health co-benefits of mitigation Discusses examples of the environmental impact of healthcare delivery and nursing practice
- Discusses the roles of nurses as change agents and advocates for environmentally sustainable healthcare practices.

**Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***

- Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security and safe housing, especially for priority populations
- Describes strategies nurses can use to support individuals and groups most at risk of climate impacts (such as air pollution, extreme temperatures, floods and fires), with particular attention to frail and elderly people, young children, pregnant women and those with pre-existing co-morbidities and/or disabilities.

# Letter to a Member of Parliament

## Learning designer

Dr Aletha Ward, University of Queensland

## Rationale

Healthcare professionals are trusted public voices and frontline witnesses to climate-related health risks such as heat stress, smoke exposure, flood disruptions, and supply chain failures. Their proximity to patients and communities gives them credibility when raising concerns with decision-makers. Writing to a Member of Parliament (MP) is a tangible way to engage in advocacy by connecting local clinical and community issues to the political process where funding, legislation, and system priorities are decided.

Letters to a MP provide a formal yet accessible mechanism for influencing policy. Unlike petitions or social media campaigns, a personalised letter from a healthcare professional can cut through competing agendas by presenting evidence on how climate change is already affecting care delivery and patient outcomes. MPs often rely on such direct accounts to understand the health system implications of abstract policies.

This teaching and learning activity will allow learners to develop skills in letter-writing, framing climate impacts as urgent health issues and articulating clear funding or policy 'asks'. It will also provide the opportunity for learners to advocate for changes that strengthen system resilience in infrastructure, workforce readiness, energy reliability, and continuity of care. This activity will help prepare future healthcare professionals to be effective healthcare leaders who can shape health policy in a warming world.

## Learning objectives

**Completion of this activity will enable learners to:**

- Identify a practical climate adaptation issue that affects service quality, safety, or access.
- Frame a clear, evidence-informed problem statement connected to patient outcomes and system performance.
- Craft a persuasive, professional letter to a MP that proposes a specific, fundable action.
- Use policy language (needs, options, benefits, costs/risks avoided, measures) and a respectful advocacy tone.

> Planetary health reminds us that the boundaries of care extend beyond the clinic walls—to the air we breathe, the water we drink, and the ecosystems that make life possible.

## Process

This activity and assessment item can be undertaken as an individual or small-group activity and will take approximately 45-60 minutes:

**Choose a priority adaptation issue (5 min)**

Examples: heat-safe clinical spaces, reliable energy/back-up power for critical services, extreme-weather surge protocols, climate-ready supply chains, staff heat/smoke guidelines, transport/telehealth during floods, medicine/cold-chain continuity etc.

**Summarise your case (5–10 min)**

Using bullet points, list:

- **Problem:** What is happening, to whom, how often, where?
- **Impact:** What is the impact of the problem? (e.g. patient safety, access, delays, costs, staffing, cancellations).
- **Ask:** One concrete funding or policy action (e.g. allocate $X for cooling retrofits and back-up power at community clinics in [region]; fund statewide heat-health protocols and training; create a rapid grant for climate-proofing critical services).
- **Benefits**: Summarise what the potential outcome of addressing the issues are. (e.g. risk reduction, continuity of care, avoided costs, workforce stability, community confidence).
- **Measures:** What will success look like (e.g. fewer heat-related ED presentations, zero vaccine spoilage, zero appointment cancellations during heatwaves).

# Letter to a Member of Parliament

**Draft your one-page letter using the following structure (15–20 min)**

- **Header:** Your name, role, postcode, date.
- **Address:** The Hon [first name, last name], MP for [electorate]. You can search for your local MP and find out how to contact them and their correct title here.
- **Opening line:** State who you are (student/ healthcare professional), and where you work/live, mention that you are a constituent (a voter). MPs tend to care more about the people they represent. Explain why you're writing to the MP (e.g. climate adaptation funding for healthcare resilience).
- **Problem paragraph:** Describe the local issue in plain language, anchored in patient care and service continuity (1–3 sentences). If your MP has made any positive steps in this area, thank them for the action they have already taken. Clearly state the facts that highlight the need for urgent further action. Why should they act?
- **Evidence/impact paragraph:** Be brief and objective utilising scientific data to persuade rather than hyperbole or exaggeration. You need to explain what needs to change and why (e.g. heat-related ED presentations, power interruptions, cancelled clinics).
- **Personal persuasion:** Explain why the issue is important to you. Brief personal stories make the issue relatable. Storytelling along with evidence is critical for advocacy.
- **The 'ask':** Briefly and clearly specify what you are asking for (e.g. raising the issue with the relevant Minister or portfolio holder; speaking about the issue in Parliament to raise awareness; funding for a particular issue).
- **Benefits and accountability:** Name 2–3 expected benefits and 1–2 simple indicators you will track.
- **Close:** Finish the letter by saying that you look forward to receiving the MP's reply.

**Peer review (5 min)**

Swap letters. Give feedback on clarity, feasibility of the 'ask', tone, and whether the benefits and measures are specific.

**Refine and finalise (5 min)**

Edit for brevity (≤ 350 words), clarity, active voice, respectful tone. Ensure one clear 'ask' only.

## Assessment

**Formative assessment option:** During the class activity, students receive feedback from the tutor and peers focusing on four main elements: clarity of the problem statement; specificity of the proposed action; use of evidence and logic to justify the ask; professional tone and format. This feedback will support learners to refine their letter before final submission.

**Summative assessment option:** Students are to submit the final version of their letter for marking.

**Assessment criteria could include:**

- Clarity of problem and impacts
- Specificity and feasibility of the ask
- Evidence and policy logic (benefits, risks avoided, measures)
- Professional tone, format, and persuasiveness

## Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 1:** ***The science of planetary health and climate change***

- Describes how climate change impacts environmental determinants of health, including air quality, food and water security.
- Outlines the impact of climate change on environmental disasters (e.g., extreme weather, floods, fires, extreme heat, sea level rise).
- Communicates effectively with various stakeholders, including colleagues, healthcare consumers and policymakers, about the consequences of climate change for human health, in order to promote informed decision-making in healthcare.

**Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***

- Discusses the roles of nurses as change agents and advocates for environmentally sustainable healthcare practices.
- Uses risk communication strategies to advocate for proactive action to address the impacts of climate change.

**Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***

- Discusses how climate change affects social and environmental determinants of health (air, water, food, housing), especially for priority populations.
- Applies knowledge and expertise to influence environmental policies and to advocate for solutions that build climate resilience.

# Cool, Calm and Prepared: Child Discharge Planning for Heat and Fire

## Learning designer

Melisa Young

## Rationale

Children are disproportionately impacted by climate hazards such as heatwaves and bushfires, particularly those with pre-existing health needs. Nurses have a critical role in ensuring discharge planning is safe, family-centred, and responsive to environmental risks. This assessment item focuses on developing practical, family-friendly discharge information that integrates evidence-based nursing care with climate resilience. By preparing discharge advice students will practice clinical reasoning, communication, and health education.

## Learning objectives

**Completion of this assessment activity will allow learners to:**

- Critically examine the specific vulnerabilities of children with chronic or acute health needs during climate related events (heatwaves and bushfires).
- Apply evidence-based, family-centred strategies to create discharge advice that supports safe care at home.
- Demonstrate skills in translating clinical knowledge into clear, culturally safe, and practical health communication.
- Reflect on the nurse's role in empowering families to anticipate and respond to climate-related risks to child health.

## Process

**1. Scenario Allocation**

Students select one of the following topics for their podcast:

- Each group of students is allocated one child's scenario
- Each scenario includes clinical details, family circumstances, and community/environmental challenges.

**2. Task**

Groups work together to:

- Identify the child's risks during the current heatwave and the impending bushfire threat.
- Develop a discharge advice sheet (see template) tailored for the family. The sheet must be clear, practical, and accessible, covering:
  - Medication and equipment needs
  - Heatwave safety and hydration
  - Bushfire readiness and evacuation planning
  - When and how to seek urgent care
  - Local supports/resources.

## Assessment

This activity can be used as the basis for a group based formative or summative assessment such as a class presentation. Alternatively, it can be used as the stimulus for individual assessment items such as a report or review of contemporary literature on solutions to the identified problem.

- Group submission: One-page discharge advice sheet designed for family use, not for clinicians (see template).
- Individual submission: A 300–400-word reflection on the challenges of balancing clinical accuracy, accessibility, and family-centred communication.

**Scenario 1: Little Lungs in a Heatwave**

Mateo is a 3-year-old boy who has been admitted to hospital following an exacerbation of his asthma. After stabilisation and education for his parents on medication use, he is now ready for discharge home. Mateo uses a preventer inhaler daily and a reliever inhaler as needed.

Mateo lives with his parents and baby sister in a rented home that has no air conditioning and poor ventilation. The family's car is unreliable, and both parents have limited English, which sometimes makes it difficult for them to follow emergency advice or health updates.

Outside, conditions are worsening. A four-day heatwave has pushed temperatures above 40°C and a bushfire has started 15 kilometres away. Smoke is visible across the area, and local authorities have warned that evacuation orders may be issued if wind conditions change. The combination of extreme heat and poor air quality places Mateo at significant risk of another asthma flare-up.

As the discharging nurse, you must work with the family to create a simple, clear one-page discharge advice sheet to support Mateo's safe return home. The plan should include heatwave and bushfire safety, medication and symptom management, and information on when and how to seek urgent help.

Local resources available to the family include:

- Asthma Australia Bushfire Smoke Guide
- Healthdirect bushfire smoke fact sheets
- State Emergency App (for fire warnings and alerts in multiple languages)
- Local GP clinic (for urgent asthma reviews)
- Pharmacy with after-hours access to inhalers.

# Cool, Calm and Prepared: Child Discharge Planning for Heat and Fire

## Assessment

**Scenario 2: Grace on the Move**

Grace is an 8-year-old girl with spastic quadriplegic cerebral palsy. She uses a wheelchair and depends on her mother and grandmother for most of her daily care, including feeding through a PEG tube. Grace is being prepared for discharge following a short hospital stay for mild dehydration and respiratory monitoring during a heatwave. Grace's family lives in a small, rented home with an evaporative air cooler, but the power supply has been unreliable during the ongoing heatwave. The home has limited insulation, and the family relies on a wheelchair-accessible taxi for transport. Grace's mother is her full-time carer, supported by her elderly grandmother. They have no other family nearby.

As the day of discharge approaches, a bushfire has started 10 kilometres away. Local authorities have issued a watch and act alert, and temperatures remain above 40°C. The family are anxious about how they would evacuate safely with Grace's wheelchair and medical equipment if an evacuation order is issued. They also worry about how to keep her hydrated and maintain her PEG feeding routine if the power goes out.

As the discharging nurse, your role is to help the family prepare for Grace's return home by developing a one-page discharge advice sheet. This should include practical steps to manage Grace's health and comfort during the heatwave, and guidance on how to prepare for possible bushfire evacuation.

Local resources available to the family include:

- NDIS-funded support provider for emergency equipment assistance
- Red Cross RediPlan for People with Disability
- Local hospital community nurse for feeding equipment support
- State Emergency Service (SES) for assisted evacuation requests
- List of wheelchair-accessible evacuation centres provided by the local council

**Scenario 3: Liam's Balancing Act**

Liam is a 12-year-old boy diagnosed with type 1 diabetes. After spending two nights in hospital for blood glucose stabilisation, he is ready for discharge. Liam requires daily insulin injections and regular blood glucose monitoring. Liam is reluctant to administer his own Insulin and often misses doses, so his father, who works shifts at a local warehouse, has been learning assist Liam to manage his care but is still building confidence with insulin administration and record keeping.

The family lives in a small rental house with two younger children. Money is tight, and the rental property does not have a reliable cooling system. The ongoing heatwave has already caused several power outages, raising concerns about keeping Liam's insulin refrigerated. Adding to the pressure, a bushfire has been burning 10 kilometres away, and authorities have issued a "watch and act" alert for their area.

Liam's father is anxious about what to do if the power goes out again, or if they are forced to evacuate. He is unsure how to transport the insulin safely, or where to go for replacement supplies if their pharmacy closes due to the fire risk. The combination of heat stress, unpredictable meals, and stress-related fluctuations in blood sugar places Liam at increased risk of a medical emergency.

As the discharging nurse, your role is to help Liam and his father plan for a safe discharge home. You are to create a one-page discharge advice sheet with clear guidance on insulin storage during heat and power loss, hydration and blood sugar monitoring in hot weather, and evacuation planning in the event of a fire.

Local resources available to the family include:

- Diabetes Australia Helpline – advice on insulin storage and travel during emergencies
- National Diabetes Services Scheme (NDSS) – emergency supply access
- Local pharmacy – replacement insulin and sharps disposal advice
- Evacuation centres with refrigerated medical storage facilities (if available)
- State Emergency App or SES updates – for local fire and evacuation alerts

**Scenario 4: Evie's Hot Days and Fire Nights**

Evie is a 6-year-old girl living with epilepsy, managed with daily antiepileptic medication. Her medication increases her sensitivity to heat, making her prone to dehydration. She has been in hospital for two days after several mild seizures during the current heatwave and is now ready for discharge.

Evie lives on a rural property with her parents and two dogs. Their home is close to bushland, and the main road in and out of the area can close quickly during fires. The family are experienced in managing Evie's seizures but have never had to evacuate for a bushfire before. They are also concerned about how they will keep her medication schedule consistent if they must leave suddenly.

Temperatures remain above 40°C, and a bushfire has been reported just 8 kilometres away. Local authorities warn that evacuation may become necessary overnight. The family is hesitant to leave early, as they worry about their pets and property. However, delays could put Evie at risk if her seizures worsen or medication is missed.

As the discharging nurse, you must prepare a one-page discharge advice sheet for Evie's family. This should include information on managing epilepsy and medication during heatwaves, hydration strategies, early evacuation planning, and how to prioritise Evie's safety in the face of bushfire risk.

Local resources available to the family include:

- Epilepsy Action Australia – emergency planning and seizure management resources
- Local rural fire service (RFS/CFA/DFES) – bushfire readiness and evacuation guides
- Local veterinary evacuation service (contact via council) for pet relocation
- Community health centre – medication and hydration support
- Healthdirect and emergency telehealth services for urgent seizure management advice.

# Cool, Calm and Prepared: Child Discharge Planning for Heat and Fire

## Discharge Advice Sheet

| | |
|---|---|
| Child's name | |
| Age | |
| Condition/Health Needs | |

| |
|---|
| 1. Key Health Needs |
| 2. Heatwave Safety |
| 3. Bushfire Safety |
| 4. Medication and Equipment |
| 5. When to seek Urgent Help - Call 000 if your child: |
| 6. Local Supports and Contacts |

# Cool, Calm and Prepared: Child Discharge Planning for Heat and Fire

| Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework | |
|---|---|
|  | **Domain 1:** ***The science of planetary health and climate change***<br>▪ Explains the interdependence of human health and the health of the environment.<br>▪ Describes how climate change impacts the environmental determinants of health, including food and water security.<br>▪ Explains how and why socioeconomically disadvantaged and marginalised communities locally, nationally and internationally, are most impacted by climate change. |
|  | **Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***<br>▪ Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security and safe housing, especially for priority populations.<br>▪ Describes strategies nurses can use to support individuals and groups most at risk of climate impacts (such as air pollution, extreme temperatures, floods and fires), with particular attention to frail and elderly people, young children, pregnant women and those with pre-existing co-morbidities and/or disabilities.<br>▪ Describes the health impacts of climate change on cardiovascular, respiratory, renal, gastrointestinal, neurological, integumentary, endocrine and reproductive systems across the lifespan. |

# Planetary Health Teaching and Learning Activities

# Walking Together on Country and Climate

## Learning designer

Christina Whitehead, University of Technology Sydney

## Rationale

Healthcare education must focus not only on healing people but also healing relationships with the environment. Indigenous worldviews offer a deeply rooted understanding of the interconnectedness between the Earth, human health, and community well-being. For many Indigenous Peoples, the land is a living relative, not a resource; land and water is sacred, and health is achieved through balance with the natural world.

As healthcare professionals confront the growing challenges related to climate change, environmental degradation, and health inequities, Indigenous knowledge systems provide a powerful lens for reimagining how environmental health is taught and practiced. Integrating these worldviews into healthcare curricula can enrich students' understanding of health as a holistic concept, one that includes the land, water, animals, and community in equal measure.

The Healthy Environments and Lives (HEAL) Network supports Indigenous leadership and collaboration in addressing the health impacts of climate and environmental change with practical, context-specific solutions. In line with The HEAL Network's core commitment to elevating Australian First Nations' grassroot leadership and knowledges, this learning activity will highlight inspiring co-designed case studies from communities who are on the frontlines of climate and environmental change.

This learning activity will enable healthcare students to critically engage with real-world case study projects that exemplify the intersection of climate change, health, and sustainable futures. Students will explore the climate-related problems being addressed and reflect on how such challenges directly and indirectly influence healthcare, including impacts on workload, patient presentations, and healthcare system resilience. The inclusion of Indigenous knowledges emphasises the importance of First Nations peoples' connection with Country, cultural land management, and conservation practices.

Students will examine how co-design fosters culturally appropriate and contextually relevant solutions, reinforcing the value of collaboration across disciplines and communities. In addition, the activity will highlight mitigation strategies with health co-benefits and showcase the roles of healthcare professionals in advancing sustainability initiatives. Students will also consider adaptation approaches by analysing how climate change threatens the social determinants of health and disproportionately affects priority populations.

Overall, this learning activity will support students in developing the essential knowledge and skills required to integrate planetary health perspectives into healthcare practice in an era of climate and ecological change.

## Learning objectives

**Completion of this activity will allow learners to:**

- Describe real-world climate change impact reduction initiatives, including critical aspects of Indigenous leadership, knowledge systems, and community priorities.
- Analyse the implications of climate change on health, through the lens of the Indigenous communities affected.
- Apply insights to propose how healthcare professionals can adopt culturally safe, climate-responsive care grounded in Indigenous knowledges and values.

## Process

This activity can be undertaken as a small group or individual activity. Students are to review one or more (depending on time allowed) of the four real-world HEAL case study projects, and discuss the following questions:

1. What climate-based problem is being addressed in the project?
2. How might community members and healthcare professionals be impacted by the climate challenge highlighted within the project?
3. How are Indigenous knowledges foregrounded in the proposed solutions?
4. How is co-design evident in the project?

**Case-study 1: Healing Country: Integrating knowledge systems to meet climate challenges.**

Guided by the Warumungu (Tennant Creek, NT), Noongar (Perth, WA), and Bundjalung (Northern Rivers, NSW) communities, the Healing Country project seeks to integrate Indigenous knowledge with environmental and health data through interactive digital story-data maps. These maps illustrate climate challenges across time, past, present, and projected future, and support community-led decision-making in collaboration with relevant agencies and services.

**View at:** Healing Country: Integrating knowledge systems to meet climate challenges - HEAL Network

**Case-study 2: Healthy-air: Pollution advice for people with asthma.**

This project places community engagement at its core, working closely with people living with asthma, especially those from socio-economically disadvantaged and marginalised communities who are disproportionately affected by the condition. Through focus groups, roundtable discussions, and interviews, the project actively involves individuals from Aboriginal and culturally and linguistically diverse communities, alongside health professionals and policy makers. These conversations help shape the understanding of lived experiences and inform the development and dissemination of evidence-based strategies to reduce air pollution exposure and improve health protection.

**View at:** Healthy-Air: Pollution advice for people with asthma - HEAL Network.

# Walking Together on Country and Climate

## Process

**Case-study 3: Extreme heat and pregnancy complications (EHPC):** Harnessing the diverse Australian climate and population for global answers. This project brings together a diverse team from across Australia, including many members of the Health Environments and Lives (HEAL) Network, to explore the impacts of extreme heat on pregnancy. Through a transdisciplinary approach combining qualitative research, environmental epidemiology, and discovery science, the team aimed to identify who is most at risk, which climate conditions heighten that risk, and why extreme heat contributes to pregnancy complications. Central to the project is meaningful collaboration with community members and stakeholders to co-design practical solutions. These include culturally relevant health education for individuals and healthcare providers, clinical tools, and public health and policy strategies to better prepare for, prevent, and respond to the effects of extreme heat during pregnancy.
**View at:** Extreme Heat and Pregnancy Complications (EHPC): Harnessing the diverse Australian climate and population for global answers - HEAL Network

**Case-study 4: Clean energy for healthy environments and lives (CE4HEAL).** This project partners with rural and remote communities in Central Australia and South India to explore and promote the adoption of solar energy. Through deep community engagement including yarning, storytelling, and shared learning, the project will gather and showcase existing clean energy initiatives already operating in these regions. Together with community members, the project will identify the barriers and enablers to expanding clean domestic energy use, and co-design culturally relevant ways to communicate the health, environmental, and economic benefits of solar energy. The project also aims to strengthen collaboration between Australian and Indian communities, fostering shared solutions and mutual learning around clean energy transitions.
**View at:** Clean Energy for Healthy Environments and Lives (CE4HEAL) - HEAL Network

## Assessment

This activity can be used as a scaffolding activity to support formative learning or be utilised as a stimulus for a summative assessment in which students are required to demonstrate an understanding of the role of Aboriginal and Torres Strait Islander knowledges, leadership, and partnerships in responding to climate change and health challenges, and then apply this understanding to culturally safe, sustainable healthcare practice.

### Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 1:** ***The science of planetary health and climate change***
- Discusses how First Nations peoples' connection with Country, cultural knowledges, land management and conservation practices, inform the agenda for a sustainable future.

**Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***
- Provides examples of direct and indirect health co-benefits of mitigation measures.
- Identifies healthcare staff involved in sustainability initiatives and describes their roles and responsibilities.

**Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***
- Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security and safe housing, especially for priority populations.

# Communicating for Climate Health

## Learning designer

Dr Aletha Ward, University of Queensland

## Rationale

Healthcare professionals are among the most trusted voices in society and play a crucial role in framing climate change as a health issue rather than just an environmental one. Yet, many report feeling unprepared to communicate effectively about climate health risks and solutions. Building communication competence can empower healthcare professionals to act as credible advocates with patients, colleagues, communities, and policymakers.

This activity draws on the WHO Communicating on Climate Change and Health Toolkit and Ward et al.'s (2025) paper on empowering healthcare professionals to speak to evidence. It positions communication as both a clinical responsibility and a professional duty that is embedded in codes of ethics. Practicing evidence-based communication strategies will assist learners to develop confidence to counter misinformation, promote planetary health and engage in advocacy and activism to address climate change, advance health equity and support intergenerational justice.

## Learning objectives

**Completion of this activity will allow learners to:**

- Apply communication strategies to explain climate health risks in clear, accessible language that is respectful, persuasive and avoids polarisation.
- Identify opportunities to reframe climate change as a health issue for diverse audiences (patients, colleagues, community members, policymakers).
- Practise storytelling and evidence-informed messaging to influence behaviour and policy.

> "Saving the planet is no longer just a scientific challenge but a communications challenge."
>
> **- David Attenborough**

## Process

**This activity is undertaken in small groups (60 minutes)**

**1. Introduction (5 min)**

The facilitator begins by emphasising the importance of communication in climate health advocacy and introduces the WHO's 10 top tips of climate health communication (see pages 13-14).

Learners are then assigned one of the following scenarios:

- The parent of a child with asthma who is worried about how climate change is or could impact their child's health.
- An 80-year-old woman who is being discharged on a summer day with predicted temperatures of 35–38-degrees.
- A colleague who tells you that they do not see how planetary health is relevant to his/her clinical work.
- A community member who wants to know how to prepare for a future floods or bushfires.
- A young person who tells you they are feeling increasingly anxious about climate change.
- A friend who is an outdoor worker who tells you he often feels unwell after working in the hot sun.

**2. Design communication interaction (20 mins)**

Groups design a 2–3-minute communication interaction that responds to the person in their scenario and that is clear, respectful, easy to understand and persuasive. The interaction should incorporate aspects of the WHO's 10 top tips of climate health communication (see pages 13-14).

**3. Class presentations (20 mins)**

Each group is to select two students to present the communication interaction to the class. One is to take the role of the person portrayed in the scenario and the other takes the role of a healthcare professional.

**4. Feedback and discussion (10 mins)**

The facilitator and other students provide feedback on each of the group's presentation focusing on the clarity and persuasiveness of the key message and whether it used plain English language that was respectful and avoided polarisation.

**5. Wrap up (5 min)**

The facilitator links the activity to the importance of advocacy, activism, and the ethical duty of healthcare professionals to communicate effectively for planetary health.

# Communicating for Climate Health

## Assessment

This activity can also be undertaken as an individual written assessment activity with reference to the communication criteria outlined in the WHO Communicating on Climate Change and Health Toolkit.

| Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework | |
|---|---|
|  | **Domain 1:** ***The science of planetary health and climate change***<br>▪ Describes, in simple terms, the basic scientific principles of climate change<br>▪ Outlines the impact of climate change on environmental disasters such as extreme weather, droughts, floods, fires, dust storms, extreme heat and sea level rises, locally, nationally and internationally.<br>▪ Explains how and why socioeconomically disadvantaged and marginalized communities locally, nationally and internationally, are most impacted by climate change.<br>▪ Communicates effectively with various stakeholders, including colleagues, healthcare consumers and policymakers, about the consequences of climate change for human health, in order to promote informed decision-making in healthcare. |
|  | **Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***<br>▪ Discusses examples of the environmental impact of healthcare delivery and nursing practice.<br>▪ Provides examples of direct and indirect health co-benefits of mitigation measures.<br>▪ Discusses personal, organisational, and political enablers and barriers to sustainable behaviours.<br>▪ Discusses the roles of nurses as change agents and advocates for environmentally sustainable healthcare practices.<br>▪ Uses risk communication strategies to advocate for proactive action to address the impacts of climate change. |
|  | **Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***<br>▪ Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security and safe housing, especially for priority populations.<br>▪ Applies knowledge and expertise to influence environmental policies and to advocate for solutions that build climate resilience. |

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World Health Organization. (2024). *Communicating on climate change and health: Toolkit for health professionals.* Geneva: WHO. www.who.int/publications/i/item/9789240090224

# Healthy Planet, Healthy People Educational Board Game


## Learning designers

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Dr Tracey Tulleners, University of Southern Queensland.


## Rationale

Human-induced destruction of nature and natural systems is threatening the stability of ecosystems and the health of all life on Earth. Initiatives designed to promote the health of the planet and its inhabitants, including climate change mitigation and adaptation strategies, are integral to healthcare professionals' scope of practice.

Although many Millennials and Generation Z learners are climate change literate, the translation of this literacy to their roles as healthcare professionals can be limited. While students often express concern about the health of the planet, few appreciate the consequences of the climate crisis on human health, or their role providing low environmental impact care.

The 'Healthy Planet, Healthy People' educational board game helps address these imperatives. It is premised on the understanding that there is 'no health without planetary health'. It takes a hopeful and solutions-focused approach that empowers players to generate new ideas for how they can individually and collectively create a healthier, more equitable world for current and future generations.

## Learning objectives

**Completion of this activity will allow learners to:**

- Explore the impact of climate change, pollution and biodiversity loss on both the environment and human health.
- Discuss the roles of healthcare professionals as change agents and advocates for environmentally sustainable healthcare practices.
- Recognise the importance of accurate waste segregation and management practices.

## Process

The 'Healthy Planet, Healthy People' game takes approximately 45 minutes and is played with players working in small groups of 6-9. The aim of the game is to be the first team to reach the finish line by answering questions correctly. There are two packs of question cards, one focuses on environmental health and the other on the impact of the environment on human health. The game encourages group members to discuss the questions and their potential answers. Immediate feedback is given after players provide their answers. There are also 'bonus' cards that reinforce positive environmental behaviours, for example: 'You joined the steering group for a student-led climate action group - MOVE FORWARD 2 SPACES'.
**Note:** Further information about the game (hard copy and digital versions) and how it is played can be found at planetaryhealthgame.com

## Evaluation

An evaluation of the impact of the 'Healthy Planet, Healthy People' game revealed a statistically significant increase in students' pre-post attitude and knowledge levels after playing the game. Satisfaction with the learning experience was also high (Levett-Jones et al, 2025).

## Assessment

A MCQ quiz could be used as a formative or summative assessment activity to test students' learning from the game. For an online example, see planetaryhealthcare.com.au/test-your-knowledge/.

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| Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework | |
|---|---|
|  | **Domain 1:** ***The science of planetary health and climate change***<br>▪ Explains the interdependence of human health and the health of the environment.<br>▪ Outlines the impact of climate change on environmental disasters such as floods, fires, dust storms, extreme heat and sea level rises, both nationally and internationally.<br>▪ Describes how climate change influences the prevalence of infectious diseases.<br>▪ Explains how and why socioeconomically disadvantaged and marginalised communities locally, nationally and internationally, are most impacted by climate change. |
|  | **Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***<br>▪ Discusses the roles of nurses as change agents and advocates for environmentally sustainable healthcare practices.<br>▪ Educates colleagues and consumers on rationales for waste segregation and management practices. |
|  | **Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***<br>▪ Describes the health impacts of climate change on cardiovascular, respiratory, renal, gastrointestinal, neurological, integumentary, endocrine and reproductive systems across the lifespan. |

## References

Levett-Jones, T., Moroney, T., Bonnamy, J., Cornish, J., Correia Moll, E., Foster, A., Lapkin, S., Pich, J., Richards, C., Tutticci, N., Tulleners, T. & Young, M. (2025). Investigating the impact of the 'Healthy Planet, Healthy People' educational boardgame: A multicentre pre-test – post-test study. Nurse Education Today. 152, 106753. doi.org/10.1016/j.nedt.2025.106753

# Getting to the Root Cause of the Problem

## Learning designer

Distinguished Professor Tracy Levett-Jones,
University of Technology Sydney

## Rationale

Healthcare students are entering their professions at a time when climate change, biodiversity loss, pollution, and unsustainable resource use are not only environmental challenges but also major health threats. Understanding the root causes, consequences, and solutions to planetary health-related problems is therefore essential.

**Root causes** are related to the upstream determinants of health. Many planetary health challenges stem from human activity, including overreliance on fossil fuels, industrial agriculture, deforestation, and inequitable economic systems. The United Nations' Sustainable Development Goals (SDGs) highlight these interconnected drivers, particularly through goals such as SDG 3 (Good Health and Well-being), SDG 13 (Climate Action), SDG 14 (Life Below Water), and SDG 15 (Life on Land). By learning about these upstream drivers, students can gain insights into how structural, political, and social forces related to planetary health shape health outcomes and health inequities.

**Consequences** include the direct and indirect health impacts of climate change, pollution and biodiversity loss. For example, environmental degradation and climate change are contributing to rising rates of heat-related illness, respiratory disease, vector-borne infections, food and water insecurity, displacement, and mental health concerns. Vulnerable populations—such as children, older adults, Indigenous communities, and people in low-income settings bear a disproportionate burden. Recognising these consequences can prepare future healthcare professionals to anticipate, prevent, and respond to these health risks.

Identification of practical **solutions** to these crises reinforces students' understanding of planetary health as a strategy to co-create healthier, more sustainable societies. Equipping students with knowledge of sustainable healthcare, low-carbon clinical practice, and resilience strategies will empower them to advocate for policies and practices that protect both people and the planet and that achieve a healthier, fairer, and more sustainable world for current and future generations.

## Learning objectives

**Completion of this activity will allow learners to:**

- Explain the root causes of planetary health challenges, including human-driven environmental changes.
- Analyse the direct and indirect health consequences of climate change, biodiversity loss, and pollution, with particular attention to health equity and the principle of 'leaving no one behind' (SDG 10).
- Evaluate and propose evidence-informed solutions for sustainable healthcare practice and professional advocacy that contribute to achieving the 2030 Agenda for Sustainable Development.

> "We need acts of restoration, not only for polluted waters and degraded lands, but also for our relationship to the world."
>
> **— Robin Wall Kimmerer**

## Process

This activity is undertaken as a small group activity. Print the Root Cause Analysis Tree template from Appendix 6 (one for each group) as an A3 document for students to record their ideas on. Alternatively, they can draft the tree on butchers paper or create a digital version. Learners work together to identify, discuss and record responses to the following questions:

- **Problem** – what planetary health problem is your group focusing on?
- **Causes** – What are five of the main causes of this problem?
- **Consequences** – What are five consequences of this problem for individuals, communities and/or healthcare services?
- **Solutions** – What are five potential solutions to this problem? Students use 'blue sky thinking' to brainstorm imaginative and visionary ideas without being overly limited by practicality, budget, or current realities.

Following the group work activity, each group presents their completed Root Cause Analysis to the class.

## Assessment

This activity can be used as the basis for a group based formative or summative assessment such as a class presentation. Alternatively, it can be used as the stimulus for individual assessment items such as a report or review of contemporary literature on the nature, extent and solutions to the identified problem.

# Getting to the Root Cause of the Problem

## Assessment

This activity can be used as the basis for a group based formative or summative assessment such as a class presentation. Alternatively, it can be used as the stimulus for individual assessment items such as a report or review of contemporary literature on the nature, extent and solutions to the identified problem.

| Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework | |
|---|---|
|  | **Domain 1:** ***The science of planetary health and climate change***<br>▪ Explains the interdependence of human health and the health of the environment.<br>▪ Outlines the impact of climate change on environmental disasters such as floods, fires, dust storms, extreme heat and sea level rises, both nationally and internationally.<br>▪ Explains how and why socioeconomically disadvantaged and marginalised communities locally, nationally and internationally, are most impacted by climate change. |
|  | **Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***<br>▪ Discusses the environmental impact of healthcare delivery and nursing practice.<br>▪ Identifies strategies for waste reduction, reuse and recycling. |
|  | **Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***<br>▪ Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security and safe housing, especially for priority populations.<br>▪ Describes strategies nurses can use to support individuals and groups most at risk of climate impacts. |

# Beyond Habit: Rethinking Personal Protective Equipment Use


## Learning designers

Dr Carol Crevacore, Edith Cowan University

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## Rationale

Personal Protective Equipment (PPE) use is one of the most visible practices associated with infection prevention and control (IPC) in healthcare. PPE is embedded within Standard Precautions to protect healthcare workers from exposure to blood and other body fluids, and to reduce the risk of pathogen cross-transmission (National Health and Medical Research Council, 2019). However, evidence suggests that PPE—including gloves (Raja Azlan et al., 2025), gowns, masks (Zimmerman, et al., 2023), and eye protection (Ghabayen et al., 2023)—is frequently used inappropriately, either overused in low-risk situations or underused when clearly indicated. This discrepancy contributes to lapses in hand hygiene, reduced effectiveness of IPC measures, and unnecessary healthcare costs.

The widespread use of disposable PPE in healthcare also carries significant environmental costs (Raja Azlan et al., 2025). Most PPE items are made from synthetic materials such as polypropylene, nitrile, or latex, which are not biodegradable and contribute to plastic pollution. Their production involves energy-intensive processes and chemical waste, while disposal—often through incineration or landfill—releases greenhouse gases and toxins (Silva, et.al., 2020). In high-use settings like hospitals, PPE waste accumulates rapidly, adding to the overall environmental footprint of clinical care. While PPE is essential for IPC, its environmental impact highlights the need for sustainable procurement, responsible use, and exploration of biodegradable alternatives or improved recycling systems within healthcare governance.

Undertaking a structured risk assessment is essential to enable healthcare professionals to make evidence-based decisions about PPE use according to the likelihood of exposure to potentially infectious agents and substances. Such assessments inform safe and appropriate use of PPE (Flores et al., 2020), while avoiding unnecessary cost and waste. Promoting critical thinking and IPC literacy is key to balancing safety with sustainability in clinical practice.

Non-sterile gloves are often over-used in the healthcare sector, contributing to poor hand hygiene, and financial and environmental waste.

## Teaching Point

This activity focuses on glove use to support beginning healthcare professionals in developing foundational decision-making skills relating to Standard Precautions. A comprehensive risk assessment for all PPE is essential to meet IPC requirements. Effective PPE use depends on evaluating the clinical context, potential exposure risks, and the need for other protective measures such as gloves, gowns, masks, and eye protection. Educators and students should view this activity as part of a broader framework for safe, evidence-based practice in preventing infection transmission and maintaining patient and staff safety.

**Note:** In this activity, 'glove' refers to non-sterile disposable gloves unless otherwise stipulated.

## Learning objectives

**Completion of this assessment activity will allow learners to:**

- Design and pilot a practical risk-assessment tool to guide decisions on PPE use in delivering clinical care.
- Critically evaluate and reflect on personal and wider scenario PPE use behaviours against current evidence and Standard Precautions.
- Identify clinical tasks where PPE use can be safely reduced.
- Assess the impacts of inappropriate PPE use on patient and healthcare staff safety, financial cost and environmental waste.

## Process

This is a small group activity involving seven interrelated steps:

**Step 1. Group brainstorm of risk factors**

- In small groups, students are to identify all possible risk factors they are aware of that may influence PPE use (e.g. contact with blood/other body fluids, patient immune status, IV-line contamination risk, facility policy, etc.).
- Students are to then rank the factors in order of importance.

**Step 2. Students read the following documents, focussing on the evidence on PPE use.**

- The World Health Organization Glove Use Information Leaflet. cdn.who.int/media/docs/default-source/integrated-health-services-(ihs)/infection-prevention-and-control/hand-hygiene/tools/glove-use-information-leaflet.pdf?sfvrsn=13670aa_10
- Time to hang up the gloves: A scoping review of evidence on non-sterile glove use during intravenous antimicrobial preparation and administration. onlinelibrary.wiley.com/doi/10.1111/jan.70197
- Standard precautions for the prevention and control of infections: Aide memoire. www.who.int/publications/i/item/WHO-UHL-IHS-IPC-2022.1
- Standard Precautions: PPE Quick Reference Guide (Appendix 7).

# Beyond Habit: Rethinking Personal Protective Equipment Use

## Process

**Step 3. Tool Development**

- Using the learning from Step 2, groups work together to develop a structured risk assessment. Options include a checklist, scoring system, or decision tree. See exemplar in Appendix 8.
- Students are to include clear decision rules (e.g. 'If anticipated exposure to blood/other body fluids → type of PPE required').
- Educators to confirm that students' risk assessment decision making tool is accurate and comprehensive.

**Step 4. Test the Tool with scenarios**

- Using scenarios 1-3 provided in Appendix 9 students apply their tool to decide on appropriate PPE use.
- Scenario 4 is for more advanced learners with well-developed clinical reasoning and technical skills.
- Answers are provided for each scenario as discussion points for educators.

**Step 5. Reflection**

- Groups are to reflect on how their own PPE use habits compare with the criteria in their risk assessment tool.
- Discuss how evidence-based and structured risk assessment practices can reduce inappropriate PPE use, financial and environmental impact, while also maintaining patient and health professional safety.

**Step 6. Sharing**

Each group will share one key learning insight from the process with the class:

- highlighting common student-insights/themes.
- emphasising the practical use of risk assessment in clinical practice.
- reinforcing the potential environmental and safety costs of inappropriate PPE use practice.

## Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***

- Responsibly selects and uses healthcare products; identifies strategies for waste
- Reduction, reuse and recycling.
- Discusses the roles of nurses as change agents and advocates for environmentally sustainable healthcare practices.

## References


Flores, A., Wrigley, M., Askew, P., Craig, R., Egan, B., Towey, L., & Shawe, J. (2020). Use of non-sterile gloves in the ward environment: an evaluation of healthcare workers' perception of risk and decision making. *Journal of Infection Prevention,* 21(3), 108-114. journals.sagepub.com/doi/10.1177/1757177420907687

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Zimmerman, P.A., Byrne, J., Gillespie., & Macbeth, D. (2023). Investigation of the selection and use of "other" personal protective equipment to prevent mucous membrane exposure in nurses: A cross-sectional study. *Infection, Disease & Health*, 28(3), 211 – 220. doi.org/10.1016/j.idh.2023.03.004

# Clinical Sustainability: Exploring Resource Use in Healthcare Practice

## Learning designer

Dr Lorraine Fields, University of Wollongong

This activity was adapted from the work of Professor Janet Richardson, University of Plymouth.
Video example: sustainability in clinical practice

## Rationale

Healthcare generates significant waste through single-use items, packaging, and overuse of consumables. Frontline healthcare professionals are ideally positioned to identify sustainable practices that reduce environmental impacts while maintaining safe, high-quality patient care. This activity will engage students in examining the life cycle and impacts of clinical consumables.

Students will explore the differences between clinical and general waste streams, consider resource constraints, and develop creative strategies to reduce, reuse, and recycle materials in practice. This activity can be conducted in a tutorial or clinical simulation setting using a round-the-table teaching format.

## Learning objectives

**Participation in this activity will allow learners to:**

- Analyse the environmental and clinical impacts of common healthcare consumables in healthcare settings.
- Explain the distinction between clinical and general waste streams and the implications for disposal and resource use.
- Develop creative, feasible strategies to reduce, reuse or recycle items in clinical practice.
- Apply critical thinking to balance patient safety, care quality and sustainability.
- Communicate findings and proposals effectively within a team setting.

## Process

**Step 1. Introduction**

The facilitator introduces the session, explaining that healthcare generates significant amounts of waste, much of it single-use items, and that healthcare professionals have an important role in recognising where items come from, how they are disposed of, and how care might need to be adapted if resources were limited (e.g. during disasters or supply chain interruptions).

Students are introduced to the **impact line** - a line marked on the floor or table. One end is labelled **'no impact on patient experience or service delivery'** and the other end **'significant impact on patient experience and service delivery.**

**Step 2. Selecting Items**

Students are provided with a range of everyday clinical consumables (e.g. wound dressing packs, IV flasks, IDC insertion sets, IV tubing, syringes, medication packaging). Each student selects one item.

**Step 3. Impact on care and service delivery**

Each student places their chosen item on the impact line at the point where they believe its absence would affect patient care.

- They then explain their reasoning to the group.
- The group discusses whether they agree, and what alternatives (reduce, reuse, recycle, substitute materials, or different clinical approaches) might be possible.
- Students are also asked to consider what might happen if this item became unavailable in a disaster scenario (e.g. flood, fire, pandemic related supply disruption).

**Step 4. Waste disposal decisions**

After all items are placed on the impact line, students are given a brief hypothetical scenario for each item (e.g. whether it has been used with a patient or remains uncontaminated). They must then decide whether the item belongs in:

- General waste
- Clinical waste
- Other (e.g. reuse/recycle where safe and appropriate)

Students explain their choice, and the group discusses safe disposal practices.

# Clinical Sustainability: Exploring Resource Use in Healthcare Practice

**Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework**

**Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***

- Responsibly selects and uses healthcare products.
- Accurately segregates and disposes of bio-hazardous, chemical, pharmaceutical and nuclear waste according to legislative and organisational requirements.
- Identifies strategies for waste reduction, reuse and recycling.

## References

Richardson, J., Grose, J., Bradbury, M., & Kelsey, J. (2017). Developing awareness of sustainability in nursing and midwifery using a scenario-based approach: Evidence from a pre and post educational intervention study. *Nurse Education Today,* 54, 51–55. doi.org/10.1016/j.nedt.2017.04.022

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# Waste Not, Care More – A Sustainability Clinical Laboratory Activity

## Learning designer

Anna Foster – Southern Cross University

## Rationale

The healthcare system is responsible, either directly or indirectly, for 5% of Australia's greenhouse gas emissions (Department of Health and Aged Care, 2023). Supply chain emissions, known as 'Scope 3' produce more than 70% of these emissions; this includes the use and disposal of consumables and pharmaceuticals, transport, repairs and maintenance. The energy used to manufacture healthcare products results in 28% of these emissions (Health Care Without Harm, 2019).

Healthcare professionals can influence the transition to more environmentally friendly healthcare through procurement of eco-conscious products, such as those made from recycled materials, the use of energy-efficient equipment, and comprehensive waste management strategies including waste segregation, recycling, and safer, greener disposal methods. These practices, often guided by circular economy principles and staff education, significantly reduce waste volume, conserve resources, lower emissions, and protect human health from waste-related hazards. Engaging healthcare students in waste reduction initiatives will enhance their environmental awareness and equip them with the skills to practice sustainably.

This learning activity provides a practical waste management experience and fosters a mindset of sustainability, preparing students to be advocates for environmentally responsible healthcare practices.

## Learning objectives

**Participation in this activity will allow learners to:**

- Analyse the types and sources of medical waste generated during common clinical procedures and examine their environmental impact.
- Design modified clinical procedures that reduce waste while maintaining patient safety.
- Evaluate and reflect on the broader implications of sustainable practice for planetary health.

"Educating for planetary health is not an optional extra—it is the essence of preparing future healthcare professionals to care for both people and the planet that sustains them".

## Process

This teaching and learning activity can take 60-90 minutes and is best undertaken in small groups of 4-5 students. It should be integrated into clinical laboratories where students are practicing resource intensive and complex procedures such as intravenous fluid setup with an intravenous secondary infusion, indwelling catheter insertion or complex wound dressings. Ideally, each group will focus on a different skill in this activity.

1. **Introduce the activity**
   Outline the learning objectives, connecting the principles of sustainability and planetary health to patient care.
   Discuss the structure of the activity explaining that students will:
   - Undertake the clinical skills as they normally would.
   - Examine the waste generated during the procedure.
   - Research the environmental impact of the resources used focusing on production, opportunities for recycling or reuse, and waste management processes.
   - Consider opportunities for redesign of the procedure to improve efficiency and reduce waste.
   - Present their results to the class.

2. **Key principles**
   - Patient safety is a priority – any proposed changes to the procedure must ensure patient safety is not compromised.
   - Collaboration is required – this reflects the need for teamwork to mitigate and advocating for change.
   - Critical and creative thinking is essential – learners should consider innovative solutions but be able to justify their decisions.

3. **The status quo – undertaking the clinical procedure and collecting all waste**
   Students undertake the procedure as they normally world, while collecting all waste generated. Students categorise and photograph the waste generated, for example:
   - Paper recycling
   - Sharps recycling
   - Clinical waste
   - General waste

4. **Waste-smart redesign and research**
   Working in groups students brainstorm and research:
   - Biodegradable or reusable resource alternatives
   - Unnecessary steps and resources that increase waste generation, which could be safely eliminated from the procedure.
   - Modifications to the procedure that could reduce resource use but still maintain patient safety.

# Waste Not, Care More – A Sustainability Clinical Laboratory Activity

5. **Group presentations**
   The groups present their findings to the class, including:
   - Types and amount of waste generated from the procedure
   - Environmental impact of the resources used including resource production and waste management
   - Opportunities for reduction of waste, recycling and reuse
   - Potential modifications to the procedure
   - Implications for patient safety.
6. **Class discussion**
   The educator leads a discussion focusing on:
   - How this activity relates to the RN Standards for Practice
   - The relationship between the concepts of sustainability and planetary health
   - The importance of advocacy in improving sustainable clinical practice
   - Potential interpersonal and system-level barriers to sustainable practice in healthcare settings.
7. **Optional component**
   The class can identify the best presentation, taking into account:
   - The quality of evidence related to the environmental impact of the resources used including the manufacturing process, opportunities for recycling or reuse, and waste management processes.
   - The group that proposed the most waste reduction
   - The balance between safety and sustainability
   - The most creative solutions.

## Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 1:** ***The science of planetary health and climate change***
- Explains the interdependence of human health and the health of the environment.
- Outlines the contribution of the healthcare system to greenhouse gas emissions.

**Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***
- Discusses the environmental impact of healthcare delivery and nursing practice.
- Discusses the roles of nurses as change agents and advocates for environmentally sustainable healthcare practices.
- Identifies strategies for waste reduction, reuse and recycling.

## References

Department of Health and Aged Care. (2023). *The National Health and Climate Strategy.* Canberra: Commonwealth of Australia. www.health.gov.au/sites/default/files/2023-12/national-health-and-climate-strategy.pdf

Health Care Without Harm (2019). *Health Care's Climate Footprint: How the health sector contributes to the global climate crisis and opportunities for action.* www.arup.com/globalassets/downloads/insights/healthcares-carbon-footprint.pdf

# Sustainable Wound Care: Good for Patients, Good for the Planet


## Learning designers

Dr Sandra Johnston, Queensland University of Technology

Dr Naomi Tutticci, Queensland University of Technology


## Rationale

With the escalating climate crisis, healthcare practitioners must critically examine the environmental impact of their practice. Medical waste is a significant contributor to carbon emissions. Chronic wound management is directly and indirectly linked to climate change, generating substantial dressing, packaging and biological waste. Inadequate knowledge of evidence-based wound care often results in inappropriate or overly frequent dressing changes, further compounding waste. Frequent patient travel to clinics, particularly in rural settings, adds to carbon emissions and intensifies the climate burden.

Chronic wounds disproportionately affect vulnerable populations, highlighting social and health inequalities. People living in areas of high population density, limited infrastructure, poor food security, low incomes, and constrained primary healthcare systems are especially vulnerable to both climate change and suboptimal wound care. Within healthcare systems, inequities are compounded by systemic challenges such as delayed referrals, overburdened community healthcare teams, and inconsistent treatment protocols.

For healthcare students, understanding the carbon footprint of wound management is essential. This involves considering not only treatment decisions, transport, product choice, and waste, but also addressing the determinants of health. Embedding sustainability into wound care practice enables clinicians to reduce the environmental burden of healthcare while simultaneously improving patient wellbeing, therefore promoting health for both people and the planet.

By applying resource-efficient, sustainable, and equitable approaches to wound care, healthcare aligns with the Sustainable Development Goals - Good health and Wellbeing (SDG 3) and Responsible Consumption and Production (SDG 12). Such actions reduce environmental harm and support a healthier, fairer and more sustainable future for generations to come.

## Learning objectives

**Completion of this activity will allow learners to:**

- Explain how sustainable clinical decisions relating to wound management can reduce the environmental footprint of healthcare.
- Analyse the consequences of unnecessary and inappropriate wound care treatments for achievement of SDG 3 and 12.
- Evaluate and propose evidence-informed solutions for sustainable healthcare practice that contribute to achieving the 2030 Agenda for Sustainable Development.

## Process

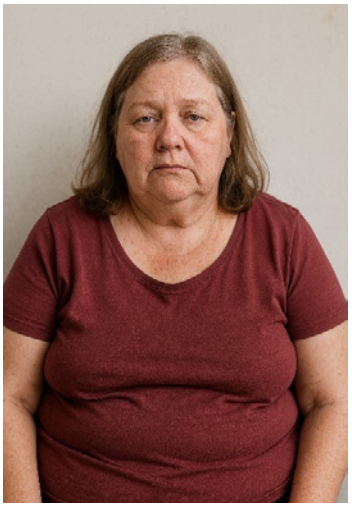
This activity is undertaken as a small group activity. Print the case study and the Centre for Sustainable Healthcare four guiding principles document provided on the following page (one for each group).

Learners are to work together to identify, discuss and record their responses to the questions on butchers' paper or they can create a digital version. Following the group work activity, each group presents their responses to the class.

Model answers to the questions asked in the template are provided in Appendix 10.

Suggested time frame to complete this activity is 60 minutes.

**Case study: Ms Sue Henderson**



Ms Sue Henderson is a 65-year-old woman, single pensioner, living in her own home.
Diagnosis: Left lower leg venous ulcer (chronic)
Past medical history:

- Cardiovascular disease
- Type 2 diabetes mellitus
- Obesity
- Depression

Recently Sue has noticed that her venous leg ulcer is producing a larger than normal volume of malodorous exudate, coinciding with hot summer temperatures.

Sue lives in a small rural town. She drives approximately 30 minutes to the local hospital each day to have her dressing changed. The hospital has limited inpatient capacity but offers a daily wound care outpatient clinic. One general practitioner services the town.

Sue's leg ulcer is being cleaned with normal saline (a new bottle is used each visit), a non-stick dressing is applied which is then covered by a combine dressing which is bandaged in place.

Sue reports that, apart from her daily visits to the clinic, she spends most of her time at home and often feels isolated and lonely. She is not interested in cooking her own meals, relying instead on take away food, or highly processed, grocery bought meals. The increasing volume and offensive odour of the wound exudate has caused her to withdraw from weekly social gatherings with friends and to avoid participating in her walking group.

# Sustainable Wound Care: Good for Patients, Good for the Planet

## Four Principles of Sustainable healthcare

1. **Prevention** – promoting health and preventing disease by addressing the causes and inequalities of healthcare. This includes minimising the need for healthcare through early intervention and health promotion activities.
   - What is the reason for Ms Henderson needing medical treatment?
   - What comorbidities does Ms Henderson have?
   - What factors that may contribute to health inequality for Ms Henderson?
   - How may climate change be linked with Ms Henderson's comorbidities, current problems and health inequalities.
2. **Patient Empowerment and Self Care** – Empowering people to take a greater role in managing their own health and healthcare. This includes self-management, informed decision-making, and shared responsibility for health.
   - How can Ms Henderson's comorbidities be better managed?
   - How can healthcare professionals incorporate climate adaptation and sustainability principles into Ms Henderson's wound management plan?
3. **Lean Service Delivery** – Streamlining care to minimise wasteful activities. This includes reduced waste, inefficiencies and unnecessary use of resources.
   - What treatment is currently being provided to Ms Henderson? How is the current treatment a source of environmental impact?
   - How is the treatment currently being delivered? What is the environmental impact of this?
   - What inefficiencies or duplication of services exist?
   - What strategies could be implemented to improve efficiency?
4. **Low Carbon Alternatives** – selecting treatments with a lower environmental impact. This includes a focus on reducing the environmental footprint of healthcare delivery.
   - What evidence-based care solutions are required? How can evidence based care reduce environmental impact?
   - Are there sustainable alternatives or practices that could be implemented?
   - In what ways could holistic care (nutrition, exercise, social connection) improve Ms Henderson's healing and reduce environmental impact?

## Assessment

This activity can be used as the basis for a group based formative or summative assessment such as a class presentation. Alternatively, it can be used as the stimulus for individual assessment items such as responding to the Centre for Sustainable Healthcare's four principles based on a given case study using evidence-based literature to support responses.

### Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 1:** ***The science of planetary health and climate change***

- Outlines the contribution of the healthcare system to greenhouse gas emissions.

**Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***

- Discusses the environmental impact of healthcare delivery and nursing practice.
- Identifies strategies for waste reduction, reuse, and recycling.

**Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***

- Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security, and safe housing, especially for priority populations.
- Describes strategies nurses can use to support individuals and groups most at risk of climate impacts.

# Responding to Infectious Diseases in a Changing Climate

## Learning designer

Dr Gemma Saravanos, University of Sydney
(with acknowledgement to Kwendy Cavanagh)

## Rationale

Human, animal and ecosystem health are deeply interconnected; a concept known as 'One Health'. Yet this balance is increasingly being disrupted by climate change, urbanisation, growing population mobility, and ecosystem degradation, all of which directly influence the transmission and impact of infectious diseases in humans.

Rising global temperatures and more frequent flooding events have resulted in expansion of mosquito populations to new geographic areas, increasing the risk of vector-borne diseases such as malaria, dengue and Japanese encephalitis. Warmer, wetter conditions also heighten the risk of tropical and water borne diseases such as cholera and leptospirosis. Additionally, extreme weather events can disrupt immunisation programs and other essential health services, contributing to increased risk of outbreaks. Some population groups are more vulnerable to climate-related infectious diseases, these include outdoor workers, indigenous peoples, children, older adults, and individuals living with chronic disease.

Addressing infectious diseases is a target of United Nations Sustainable Development Goal 3 (SDG 3) which aims to achieve good health and well-being for all people. Climate change complicates progress towards this goal, requiring coordinated action across related SDGs including clean water and sanitation (SDG 6), protection of ecosystems (SDG 14 and 15), climate action (SDG 13), and multisectoral partnerships (SDG 17).

Healthcare professionals are uniquely positioned to lead and support responses to climate-related infectious disease outbreaks, drawing on their clinical, public health, and risk communication expertise. Those in frontline and community-based roles are often the first to identify and respond to emerging threats. Using Primary Health Care principles, they can shape evidence-informed, equitable and community-centred responses that consider the population at risk, the pathogen, and the environmental context (see Figure 1).

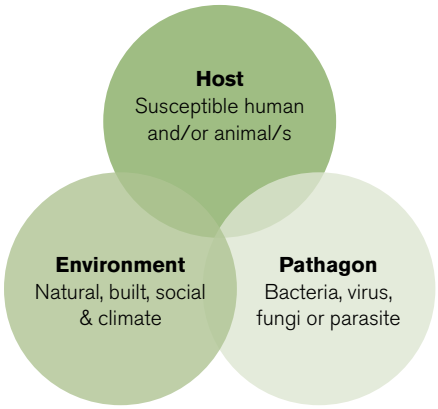



*Figure 1. Triad of infectious disease*

## Learning objectives

**Completion of this activity will allow learners to:**

- Explain the concept of 'One Health' and how human, animal and ecosystem health intersect to contribute to infectious disease outbreaks.
- Identify and categorise activities across three levels of prevention in response to a climate-related infectious disease outbreak.
- Apply the principles of Primary Health Care to develop equitable, sustainable, and community-engaged responses to climate-related infectious disease outbreaks.
- Describe the importance of climate change mitigation, adaptation, and response in preventing and managing infectious diseases.
- Critically evaluate the role of healthcare professionals in climate-related public health responses, including through risk communication.

## Process

This activity is undertaken with students working in small groups. It can be integrated into any subject with a global, population, community, infectious diseases, or planetary health focus. Each group is provided with one of the 'climate-related infectious disease outbreak' scenarios, including key information about the population, the pathogen, and the environmental context. Educators may use or adapt the example scenarios as appropriate for their local context and infectious disease epidemiology. Learners work collaboratively, drawing on high-quality, contextually relevant evidence to co-create an 'outbreak response plan' which addresses three key areas (see Figure 2).

| Preparation | Prevention | Partnership |
|---|---|---|
| Research | Primary | Community engagement |
| Response team | Secondary | Communication |
| Resources | Tertiary | Priority groups |

*Figure 2. Framework for climate-related outbreak response plan*

The following 'Guiding Questions' can support learners to consider key activities for each area. The 'Reflective Questions' prompt learners to consider how their outbreak response plan integrates planetary health and primary health care principles and to make modifications to their plan if needed.

# Responding to Infectious Diseases in a Changing Climate

## Process

**Guiding Questions:**

Preparation for outbreak response:

- What do you need to know about the disease or the outbreak?
- Who will you need on your team and what will they do?
- Do you need to engage experts or agencies from other sectors?
- What resources (e.g. tools and equipment) will you need?

**Prevention across three levels:**

- Primary prevention: How will you prevent new infections and future outbreaks?
- Secondary prevention: How will you detect infections early and control the spread?
- Tertiary prevention: How will you manage and care for those affected?

**Partnership with the community:**

- How will you engage the community as active partners in the outbreak response?
- How will you communicate risks, recommendations and other information?
- How will you engage and communicate with priority population groups?

**Reflective Questions: Reflect on the integration of planetary health and primary health care principles.**

- How does your plan address the environmental drivers of the outbreak?
- How does your plan contribute to future climate-resilient communities and health systems?
- How does your plan demonstrate primary health care principles?

## Assessment

This activity can be used as the basis for an in-tutorial, group-based assessment reflecting the collaborative and time-sensitive nature of public health responses. Assessment outcomes should consider both the process - research, teamwork and innovation, and the product – an evidence-informed response plan. This activity may also be used as a stimulus for an individual assessment, such as a response plan, report or reflection.

## Example climate-related infectious disease outbreak scenarios

**Example Scenario 1. Japanese Encephalitis Outbreak**

You are part of the multidisciplinary public health team responding to an outbreak of Japanese encephalitis in a south coast community. This is the first time that Japanese encephalitis virus (JEV) has been detected in the region. Case numbers are rising, several individuals have required hospital care, and there has been one death.

Environmental contributors to the outbreak include warm conditions and above average rainfall which has led to an expansion of local mosquito populations. Key community groups include First Nations people, livestock farmers, young families, and a growing population of new migrants. Community leaders have called for transparency and coordinated action to address the outbreak.

Your team must consider immediate management and communication of the JEV outbreak as well as longer-term prevention strategies. These should incorporate community partnerships, environmental management, targeted vaccination programs, and climate resilience.

**Example Scenario 2. Measles Outbreak**

You are part of the multidisciplinary public health team responding to a measles outbreak in a far west regional town during a severe heat event. The first measles case was detected in a 10-year-old child returning from travel to Southeast Asia. Local transmission has been confirmed, and several exposure sites, including the local primary school, are currently under investigation.

The community is now entering its' fifth consecutive day exceeding 42$^{0}$C. Local healthcare services are under strain due to the combined impact of the outbreak, increased heat-related presentations, and intermittent power outages. Vulnerable population groups include infants, pregnant women, older persons and outdoor workers. A community clinic has reported a cold-chain breach, potentially compromising the efficacy of recently received vaccinations.

Your team must coordinate outbreak control, assess vaccine coverage, and support heat-related health needs while maintaining public trust and supporting community climate resilience.

**Example Scenario 3. Leptospirosis Outbreak**

You are part of the multidisciplinary public health team responding to a leptospirosis outbreak in a flood-affected rural community. There has been one leptospirosis-related death and several hospitalisations.

Environmental contributors to the outbreak include increased rodent activity and flooding, with exposure to contaminated water and soil posing ongoing risks. Road closures in some parts of the community are presenting challenges for healthcare access. The community includes a large First Nations population with strong ties to local farming and tourism industries. Community leaders and Elders are calling for culturally safe, community-led responses.
Your team must consider immediate management of the outbreak and longer-term prevention strategies. These should include culturally safe risk communication, environmental management, climate resilience, and partnerships with community leaders.

# Responding to Infectious Diseases in a Changing Climate

| Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework | |
|---|---|
|  | **Domain 1:** ***The science of planetary health and climate change***<br>▪ Explains the interdependence of human health and the health of the environment.<br>▪ Describes how environmental conditions and climate change influences the prevalence of infectious diseases<br>▪ Explains how and why socioeconomically disadvantaged and marginalised communities locally, nationally and internationally, are most impacted by climate change. |
|  | **Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***<br>▪ Discusses the environmental impact of healthcare delivery and nursing practice.<br>▪ Identifies strategies for waste reduction, reuse and recycling. |
|  | **Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***<br>▪ Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security and safe housing, especially for priority populations.<br>▪ Discusses how healthcare settings can adapt models of care and resourcing to manage climate-driven disasters. |

# Climate-Driven Disasters: Mitigation and Adaptation Activity

## Learning designer

Dr Lorraine Fields, University of Wollongong

## Rationale

Climate change is increasing the frequency and intensity of extreme weather events, which have direct and indirect impacts on human health and healthcare systems. Healthcare professionals must understand these impacts in order to contribute to resilient healthcare services.

Examining recent Australian disasters such as the 2019–2020 NSW bushfires, 2025 NSW floods, and Tropical Cyclone Alfred, will allow learners to explore how climate-related events affect communities and healthcare delivery.

This activity will allow learners to apply the principles of **mitigation** (reducing future disaster risks) and **adaptation** (enhancing preparedness and response) to clinical practice and healthcare system planning. By analysing real-world disasters, students will develop critical thinking, collaborative problem-solving, and professional communication skills relevant to planetary health and climate resilience.

## Learning objectives

**Completion of this activity will allow learners to:**

- Analyse the health and healthcare impacts of climate-driven disasters.
- Differentiate between mitigation and adaptation strategies in the context of healthcare systems.
- Collaborate effectively to propose evidence-based solutions that enhance healthcare resilience.
- Communicate findings and recommendations clearly.
- Reflect on the role of healthcare professionals in promoting sustainable, climate-resilient healthcare practice.

## Process

**Group formation**

Learners will be divided into groups of 5-6. Each group will be assigned a focus area (either mitigation or adaptation) and a disaster case study such as the ones below.

**Note:** Educators may wish to source other case studies relevant to their State or Territory.

- 2019–2020 NSW Bushfires
- 2025 NSW Floods
- Tropical Cyclone Alfred

**Research and analysis**

Groups are to:

1. Review the assigned disaster case study
2. Identify health and healthcare impacts of the disaster, for example:
   - Impacts on human health and body systems.
   - How socioeconomically disadvantaged and marginalised communities are disproportionately affected.
   - Effects on social and environmental determinants of health (e.g. clean air, safe drinking water, food security, safe housing).
   - Healthcare system challenges (e.g. hospital surge, limited access for staff and constrained supplies and resources).
3. Explore strategies aligned with their focus area; either:
   - Mitigation: Measures to reduce risk or prevent future impacts.
   - Adaptation: Actions to enhance healthcare system preparedness and resilience.
4. Prepare a 5–10-minute group presentation summarising findings, strategies, and recommendations.

**Group presentations**

Each group presents to the class. Peers to provide constructive feedback and discuss cross-case insights.

**Class discussion**

Facilitator to lead a discussion focusing on:

- Common challenges and lessons across different disasters.
- The role of healthcare professionals in implementing mitigation and adaptation strategies.
- Opportunities to integrate climate resilience into everyday healthcare practice.

# Climate-Driven Disasters: Mitigation and Adaptation Activity

| Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework | |
|---|---|
|  | **Domain 1:** ***The science of planetary health and climate change***<br>▪ Explains how and why socioeconomically disadvantaged and marginalised communities locally, nationally and internationally, are most impacted by climate change. |
|  | **Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***<br>▪ Discusses the meaning of mitigation of climate change and related terms. |
|  | **Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***<br>▪ Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security and safe housing, especially for priority populations.<br>▪ Describes the health impacts of climate change on cardiovascular, respiratory, renal, gastrointestinal, neurological, integumentary, endocrine and, reproductive systems across the lifespan.<br>▪ Discusses how healthcare settings can adapt models of care and resourcing to manage climate-driven disasters. |

# Responding to Extreme Weather Events Tabletop Simulation


## Learning designers

Distinguished Professor Tracy Levett-Jones

Dr Aletha Ward, University of Queensland

James Bonnamy, Monash University


## Rationale

The World Health Organization has described climate change as the greatest threat to public health in the 21st Century. Australians are already feeling the effects of a warming planet with more frequent and intense heatwaves, unprecedented droughts, fires and floods.

Illness, injury and death related to environmental disasters and extreme heat represent just a few of the impacts of climate change on people's health and well-being. Fifty-five per cent of Australian healthcare professionals report that their workplaces have been affected by an extreme weather events. Healthcare professionals will be increasingly required to contribute to mitigation efforts and support people and communities to adapt to the impact of extreme weather events.

## Learning objectives

**Participation in this activity will allow learners to:**

- Explore how extreme weather events can affect healthcare infrastructure, resources and patient care.
- Develop skills in assessment, prioritisation and decision-making while in challenging situations.
- Adapt teamwork and communication skills to ensure a coordinated and efficient response during crises.
- Educate colleagues, healthcare organisations and communities on preparing for extreme weather events.
- Reflect on their experiences, identify key lessons learned, and apply these insights to real-world situations.

> "The health of people and the health of the planet are one and the same—our curricula must teach that truth."
>
> **- Lancet Commission on Planetary Health (2015)**

## Process

- Educators are to access the required simulation cards, lesson plan and PowerPoint resource at planetaryhealthcare.com.au/education
- The simulation takes approximately an hour and is played as a 'table-top' group-based activity.
- Divide participants into six groups. Each group should be given a pack of cards that profiles a different extreme weather event.
- Groups should place cards upside down so that the images rather than text are visible.
- **Instruct participants to turn and read the first two cards only. The remaining cards are to be left upside down** until you call 'start', at which time the groups are to read and discuss how they would respond to the situation described on the **first card only.**
- At specific points in time (5-10 minutes), call 'next card' and the groups should turn over the next card and discuss how they would respond to the unfolding situation described.
- Instruct participants that when responding to the situations described in the scenarios, it is important that they think broadly and consider more than the immediate healthcare concerns presented. The focus should be on coordination of the emergency response, as well as prioritisation and communication.
- While participants may not feel they have the experience to manage the situations presented, they may in fact be the most experienced person in an extreme weather event and others will undoubtedly turn to them for advice – this simulation is about being resourceful and creative.
- **Note:** While some prompts have been provided in the lesson plan, they should only be used if the participants are struggling with ideas. The key purpose of the simulation is to provide a 'free flowing', enjoyable and active learning experience where participants brainstorm ideas within their groups while considering a range of possible 'out of the box' solutions.

## Debrief

After the simulation activity, the educator is to facilitate a debrief and discussion with the whole group focusing on the following questions:

- Overall, how did you feel about the simulation experience?
- What were the main issues presented in your simulation, two of the main challenges encountered and the strategies used to address them.
- How would you advise the key people in your scenario to prepare for similar extreme weather events?

**Conclude by emphasising that:**

- The impacts of climate change are increasingly evident across the world, resulting in more frequent and severe extreme weather events.
- Healthcare professionals are on the front lines of these crises, both professionally and personally.
- This simulation has provided an opportunity to explore healthcare professionals' leadership, resilience, and adaptability in the face of unprecedented challenges, both in the immediate response, and in building community resilience.

# Responding to Extreme Weather Events Tabletop Simulation

## Evaluation

Student feedback on this simulation indicated that students believed the simulation enhanced their critical thinking, decision making, collaboration, teamwork, preparedness, and adaptability in crisis situations. It also prompted their reflection on the emotional and ethical considerations of disaster responses (Levett-Jones et al, 2025).

### Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 1:** ***The science of planetary health and climate change***

- Outlines the impact of climate change on environmental disasters such as floods, fires, dust storms, extreme heat and sea level rises, both nationally and internationally.
- Describes how climate change influences the prevalence of infectious diseases.
- Explains how and why socioeconomically disadvantaged and marginalised communities locally, nationally and internationally, are most impacted by climate change.
- Communicates effectively with various stakeholders, including colleagues, healthcare consumers and policy makers, about the consequences of climate change for human health, in order to promote informed decision making.
- Advocates for and works with those most impacted by the short and long term impacts of climate change.

**Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***

- Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security and safe housing, especially for priority populations.
- Outlines potential psychological responses and mental health impacts of climate change, including anxiety and stress.
- Discusses how healthcare settings can adapt models of care and resourcing to manage climate-driven disasters.
- Engages with community members to promote and protect health in the context of weather extremes and climate-driven disasters.
- Works collaboratively and within interprofessional teams to respond to climate related health issues and disasters.
- Applies knowledge and expertise to influence environmental policies and to advocate for solutions that build climate resilience.

## References

Levett-Jones, T., Zehntner, C. & Ward, A. (2025). Enhancing nursing students' capacity to respond to extreme weather events using an innovative tabletop simulation activity. *Teaching & Learning in Nursing.* 000, 1-5. doi.org/10.1016/j.teln.2025.03.007

# Planetary Health Puzzle Challenge

## Learning designer

Dinithi Samarakoon, Edith Cowan University - Sri Lanka

## Rationale

Healthcare students often have limited knowledge of planetary health concepts, despite the growing impact of climate change and environmental degradation on health outcomes. Engaging students through interactive learning methods such as puzzles and case-based problem solving promotes deeper understanding and retention of knowledge. This activity encourages students to explore connections between environmental challenges and health impacts in an enjoyable and collaborative way.

By mapping eco health relationships and solving real world scenarios, learners can better appreciate their role in sustainable healthcare practices, disaster preparedness, and advocacy for healthier environments.

## Learning objectives

**Completion of this activity will allow learners to:**

- Identify links between planetary health concepts (e.g. climate change, pollution, biodiversity loss) and human health outcomes.
- Apply critical thinking to specific case studies involving planetary health issues.
- Collaborate on problem solving tasks that highlight sustainable healthcare practices.
- Reflect on the role of healthcare professionals in promoting planetary health at individual, community, and policy levels.

## Process

**Step 1: Puzzle Briefing**

Educators are to print the full set of cards from the Eco Health Puzzle Pack for each group (see Appendix 11).

Learners are divided into small groups (4–5 students). Each group receives an Eco Health Puzzle Pack containing:

- 'Challenge cards' (real world scenarios).
- 'Planetary health' cards (e.g. climate change, air pollution, biodiversity loss, waste, disaster preparedness).
- 'Health impact' cards (e.g. vector-borne diseases, respiratory illness, food insecurity, mental health issues).
- 'Health professional response' cards (e.g. patient education, sustainable practices, disaster response, advocacy).

**Step 2: Puzzle Assembly**

Each group draws one Challenge Card and must find and match the correct Planetary Health Factor, Health Impact, and Response cards. Depending on time available, groups can be asked to draw more than one Challenge Cards to match with the other relevant Cards.

**Step 3: Bonus Advocacy cards**

Bonus cards are provided for groups who can suggest policy level or advocacy actions related to their scenario.

**Step 4: Reflection and debrief**

Each group presents one completed puzzle set to the class and facilitates a discussion addressing these questions:

- What surprised you?
- What connections were hardest to make?
- How has this activity changed your perspective on the role of healthcare professionals in planetary health?

**Example puzzle scenario**

- Scenario card: 'Following recent floods in Sri Lanka, a rural community faces a rise in dengue fever cases.'
- Planetary health factor card: Climate change → increased rainfall and flooding.
- Health impact card: Rise in vector-borne diseases.
- Response card: Health education on vector control, community awareness campaigns, supporting local disaster response.

**Scoring (if competitive play is desired)**

- 3 points for each correct full set (Scenario + Factor + Impact + Response).
- +1 bonus point if a group proposes an advocacy action linked to their case.
- Winner = group with the most points after 3–4 rounds.

**Assessment (optional)**

Learners can be asked to submit a short reflective piece (300 words) on what they learned about planetary health, potential health connections and the implications for their practice.

**Marking criteria if activity is used for assessment**

| Criteria | High | Medium | Low |
|---|---|---|---|
| Accuracy | Correctly matches all cards with clear rationale | Some correct matches but weak connections | Few or no correct matches |
| Collaboration | Strong teamwork and discussion evident | Some teamwork, uneven participation | Minimal collaboration |
| Reflection | Thoughtful insights linking planetary health to health outcomes | Some reflection but superficial | No meaningful reflection |

# Planetary Health Puzzle Challenge

## Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 1:** ***The science of planetary health and climate change***

- Describes how environmental conditions and climate change influence the prevalence of infectious diseases.
- Describes how climate change impacts the environmental determinants of health, including food and water security.
- Communicates effectively with various stakeholders, including colleagues, healthcare consumers and policy makers, about the consequences of climate change for human health, in order to promote informed decision making.
- Advocates for and works with those most impacted by the short and long term impacts of climate change.

**Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***

- Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security and safe housing, especially for priority populations.
- Describes strategies nurses can use to support individuals and groups most at risk of climate impacts.
- Engages with community members to promote and protect health in the context of weather extremes and climate-driven disasters – Works collaboratively and within interprofessional teams to respond to climate related health issues and disasters.

# Impact and Action: Planetary Health Card Game

## Learning designer

Anna Foster, Southern Cross University

## Rationale

The accelerating challenges of planetary health demand that future healthcare professionals develop not only content knowledge but also critical thinking, collaboration, and adaptive skills. Interactive activities, such as case-based, gamified scenarios, have been shown to enhance student engagement, critical thinking, and motivation and promote a non-threatening, student-centred approach (Boctor, 2013). Embedding planetary health into undergraduate curricula through active learning is increasingly recognised as essential for fostering systems thinking and sustainability competencies across disciplines (Barna et al., 2020).

The *Impact & Action: Planetary Health Challenge* card-based game will prompt students to analyse environmental health impacts, prioritise care under various environmental and social constraints, and collaboratively propose adaptation and advocacy responses. By situating learning in an interactive, problem-solving context, this activity will cultivate the skills required for ethical, sustainable healthcare in a changing world.

## Learning objectives

**Completion of this activity will allow learners to:**

- Identify and analyse the health impacts of environmental and planetary health challenges on vulnerable populations.
- Develop and propose healthcare strategies to respond, mitigate or adapt to these impacts.
- Triage care, communicate and justify decisions collaboratively.

## Process

This card game is played in groups of 4-6 students.

A complete set of cards (see Appendix 12) will be required for each group. They should be printed double-sided on card or regular paper, cut out and laminated for durability.

The four sets of cards need for each group include:

- Character profile cards – **YELLOW** – all of the characters are considered to be 'vulnerable' in relation to environmental/planetary health impacts.
- Scenario cards – **BLUE** - an environmental or planetary health situation/challenge.
- Wildcard cards – **RED** - add complexity to the character's situation.
- Action cards – **GREEN** - healthcare actions that might be applied to the situation.

**Steps in the game:**

1. **Drawing the cards (approximately 10 minutes)**
   - Each student is to draw **one CHARACTER PROFILE CARD** (yellow card) - this card represents the patient they will be 'caring for'.
   - Students are provided with 5 minutes to research their character and how they may be from a vulnerable population when it comes to planetary health impacts.
   - Each student should now **draw one PLANETARY HEALTH SCENARIO card** (blue card) - this card represents the context the patient finds themselves in currently.
   - Each student should also **draw one WILDCARD scenario card** (red card) - this card adds an urgent complication to the scenario.
2. **Group discussion and triage (5 minutes)**
   - The groups should spend 5 minutes as a team discussing the characters and scenarios they have drawn and determine which one is the top priority or most critical.
   - As a group, students must triage the characters in order of severity and provide justification for their decisions.
3. **Taking action (5 minutes)**
   - The students place the 9 ACTION CARDS (green cards) face up on the table.
   - Each group must choose one action card for each patient situation. Each action card can only be used once.
   - Students must debate which action card is the best fit for their character.
   - This step reinforces the prioritisation and resource allocation associated with climate events.
4. **Presenting to the broader group (5 minutes per group)**
   - Each group should allocate a speaker for their group.
   - The speaker needs to briefly explain which character they prioritised and why and what actions they chose for this character and why.
5. **Debrief (10-15 minutes)**
   - The educator should lead the class in a debrief and discussion of planetary health and the scenarios used in the session.
   - Some themes that may be explored could include:
     - The vulnerable populations – which group/s seem at greatest risk across the scenarios?
     - Resource allocation – how did the groups negotiate allocating resources and care with the limited action cards (which replicate potential disruptions to care and support in a real-world scenario)?
     - Systems impacts – what role does the healthcare system play in limiting or amplifying risks?
     - Advocacy role – how can healthcare workers act beyond the immediate patient situation?
     - Educators should ask the students what the challenges were for prioritising care and highlight the role of the healthcare professions in preventing and responding to real-world planetary health challenges.

# Impact and Action: Planetary Health Card Game

## Reflection

An optional take-home reflection sheet (see Appendix 13) is available for students to consolidate their learning.

| Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework | |
|---|---|
|  | **Domain 1:** ***The science of planetary health and climate change***<br>▪ Outlines the contribution of the healthcare system to greenhouse gas emissions.<br>▪ Explains the interdependence of human health and the health of the environment.<br>▪ Describes how environmental conditions and climate change influence the prevalence of infectious diseases, extreme events, or environmental health risks. |
|  | **Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***<br>▪ Discusses examples of the environmental impact of healthcare delivery and nursing practice.<br>▪ Discusses the roles of nurses as change agents and advocates for environmentally sustainable healthcare practices. |
|  | **Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***<br>▪ Discusses how climate change affects the social and environmental determinants of health, such as clean air, safe drinking water, food security and safe housing, especially for priority populations.<br>▪ Describes strategies nurses can use to support individuals and groups most at risk of climate impacts (such as air pollution, extreme temperatures, floods and fires), with particular attention to frail and elderly people, young children, pregnant women and those with pre-existing co-morbidities and/or disabilities. |

## References

Barna, S., Maric, F., Simons, J., Kumar, S., & Blankestijn, P. J. (2020). Education for the Anthropocene: Planetary health, sustainable health care, and the health workforce. *Medical Teacher,* 42(10), 1091-1096. doi.org/10.1080/0142159X.2020.1798914

Boctor, L. (2013). Active-learning strategies: The use of a game to reinforce learning in nursing education. A case study. *Nurse Education in Practice,* 13(2), 96-100. doi.org/https://doi.org/10.1016/j.nepr.2012.07.010

# Dear Earth: Cultivating Planetary Empathy


## Learning designers

Dr Aletha Ward, University of Queensland

Distinguished Professor Tracy Levett-Jones


## Rationale

Planetary empathy includes deep reflection on one's relationship with nature, curiosity about other worldviews, and assumption of responsibility for creating a healthier and more equitable world for current and future generations. People with high levels of empathy for nature are 72 times more likely to engage in pro environmental behaviours than people with lower levels (Sollis et al, 2024).

While empathy has traditionally centred on the individual patient, planetary empathy is a new construct that includes an affective, cognitive, and behavioural response to a planet at risk, and to current and future generations who will inherit the planet.

This activity uses reflective writing to nurture empathy for the planet. By engaging learners in the process of writing their own 'Dear Earth' letters, students will explore the emotional, ethical, and professional responsibilities of healthcare professionals as planetary health stewards. This will foster a critical consciousness and prepare graduates to embed planetary empathy into their practice, advocacy, and education.

## Learning objectives

**Completion of this activity will allow learners to:**

- Explore planetary empathy and its relevance for clinical practice.
- Reflect on personal experiences and values in relation to nature.
- Express an affective and cognitive empathic response to the Earth through creative writing.
- Identify professional actions that demonstrate planetary empathy in healthcare practice.

> "We are all in this earthly game together, human, animal, plant, soil, and we all need care and keeping."
>
> **– Jess Dillard-Wright**

## Process

1. **Introduction (5 mins)**
   Facilitator introduces the concept of planetary empathy, with reference to Levett-Jones et al (2025) and Ward et al (2024). Optionally, the introduction can include a mindfulness activity related to nature such as www.youtube.com/watch?v=ZToicYcHIOU.
2. **Guided reflection (10 mins)**
   Learners reflect on a personal experience of being in and feeling connected to nature (e.g., a recent experience of being in nature, a favourite place in nature, or a childhood memory). In pairs or small groups, learners share their memory and its significance.
3. **Writing a 'Dear Earth' letter (15 mins)**
   Using free writing (a technique of continuously writing for a set period, letting thoughts flow onto the page without interruption for grammar, spelling, or structure), learners compose a half to one-page letter to Earth that:
   - Describes their personal appreciation for Earth's beauty and fragility.
   - Acknowledges the harms caused by human activity.
   - Expresses empathy and accountability for the health of the planet.
   - Commits to at least one professional and one personal action that demonstrates empathy for the planet.
4. **Sharing (10 mins)**
   Volunteers are invited to read their letters to the group.
5. **Debrief (10 mins)**
   Facilitator leads a discussion on how planetary empathy can influence how healthcare professionals engage in pro-environmental behaviours that protect and preserve the planet.

## Assessment

**Formative:** Tutor provides feedback on the depth of reflection and authenticity of students' empathic responses. Peers should also be encouraged to provide feedback.

**Summative:** An optional assessment item could include submission of a revised version of the 'Dear Earth' letter for marking or the creation of digital story with images and narration of the 'Dear Earth' letter. These can be assessed for:

- Expression of planetary empathy
- Integration of personal reflection with professional responsibility
- Identification of pro-environmental personal and professional behaviours
- Clarity and coherence of writing.

# Dear Earth: Cultivating Planetary Empathy

| Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework | |
|---|---|
|  | **Domain 1:** ***The science of planetary health and climate change***<br>▪ Explains the interdependence of human health and the health of the environment.<br>▪ Describes how climate change impacts environmental determinants of health, including air quality, food and water security.<br>▪ Communicates effectively with various stakeholders, including colleagues, healthcare consumers and policymakers, about the consequences of climate change for human health, in order to promote informed decision-making in healthcare. |
|  | **Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***<br>▪ Discusses the roles of nurses as change agents and advocates for environmentally sustainable healthcare practices.<br>▪ Explains how nurses uphold the ethical principles of beneficence, nonmaleficence, autonomy and justice by practicing in an environmentally sustainable manner. |
|  | **Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***<br>▪ Outlines potential psychological responses and mental health impacts of climate change, including anxiety and stress.<br>▪ Responds appropriately to the emotional and mental toll of climate change impacts on colleagues' and own well-being.<br>▪ Applies knowledge and expertise to influence environmental policies and to advocate for solutions that build climate resilience. |

## References

Levett-Jones, T., Tunks Leach, K., Honneger Rogers, H., Richards, C., Ward, A. & Lapkin, S. (2025). Development and preliminary validation of the Planetary Empathy Scale: An international study. Challenges: nurturing collective consciousness in the Anthropocene special edition. 16, 56, 1-15. https://doi.org/10.3390/challe16040056

L*evett-Jone*s, T., Tunks Leach, K., Honegger Rogers, H., Richards, C., Best, O. & Ward, A., Tulleners, T., Hills, D., Best., (2025). Interconnected health: A concept analysis of planetary empathy for healthcare professionals. *Nursing Outlook.* 102337 doi.org/10.1016/j.outlook.2024.102337

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Sollis, K., van Eeden, L. M., Rajeevan, U., Lin, B. B., Lee, K., Keniger, L., Klippan, L., Marsh, P. & Flies, E. J. (2024). A National Survey on Nature Connection: infographic summary. Sustainable Communities and Waste Hub: Sustainable People Environment Interactions (IP1). doi.org/10.25959/26212505

# Healthcare in 2050: The Dual Realities of Climate Change

## Learning designer

Dr Aletha Ward, University of Queensland

## Rationale

Hope is the belief in our collective ability to create a healthier, more equitable world for current and future generations. This teaching and learning activity embraces hope by supporting students to consider two possible future scenarios for the planet and for healthcare.

This activity is based on an article written by Ward, et al., (2024) that describes two contrasting future scenarios to illustrate what healthcare service provision may look like in the future. In one scenario early warning systems, resilient infrastructures, renewable energy, and trained teams enable continuity of care even during extreme weather events. In the other, emissions targets are missed, hospitals face sweltering wards, failing power and IT systems, resource shortages, and exhausted staff struggling to provide care amid floods and storms. These divergent scenarios highlight how climate inaction or proactive adaptation will shape patient safety, staff wellbeing, and community resilience in the future. This activity uses these dual realities to help learners compare impacts, synthesise equity-centred mitigation and adaptation strategies, and identify leadership actions for resilient, low-emissions care. It will serve as a call to action, emphasising the pivotal role of healthcare professionals in driving change for a positive and hopeful future.

## Learning objectives

**Completion of this activity will allow learners to:**

- Analyse how different climate policy trajectories (missed vs met targets) might alter health risks, service demand and workforce pressures in 2050.
- Apply systems thinking to connect environmental change with clinical operations, supply chains, workforce wellbeing and access to care.
- Identify feasible mitigation and adaptation strategies that will reduce risk, improve quality and lower environmental impact.
- Articulate healthcare professionals' leadership roles in advocating for resilient, low-emissions models of care.

## Process

This is a small-group activity (4-6 students per group) with a suggested duration of 60 minutes.

**Brief (5 min):** The facilitator introduces the two scenarios ('targets missed' and 'targets met') and outlines the learning activity.

**Scenario A discussion (15–20 min):** In groups students imagine and discuss a future (2050) where proactive adaptation measures such as early warning systems, resilient infrastructure, surge planning, reliable energy and workforce training have been implemented to address the planetary health crisis.

**Scenario B discussion (15–20 min):** In groups students imagine and discuss a future (2050) where emissions targets have not been met, global temperatures have continued to increase, and healthcare organisations have not prepared for the climate crisis. Discuss immediate and cascading impacts on patients, workforce, facilities, medicines/cold-chain, logistics and community access. Highlight risks and vulnerabilities.

**Contrast and synthesis (10–15 min):** Groups compare the two futures, identifying vulnerabilities versus mitigations, and draft three practical strategies that are low-cost and that will improve both resilience and sustainability regardless of whether emissions targets are met (e.g., strengthening cold-chain reliability, staff heat-health training, or accurate waste segregation).

**Report-back (10 min):** Each group presents an outline of one of their scenarios (Scenario A or B) and proactive adaptation measures that they believe healthcare professionals should take to prepare healthcare organisations for the planetary health crisis.

**Debrief (5 min):** The tutor facilitates discussion on how embedding planetary health principles into practice can transform healthcare delivery and how healthcare professionals can lead this transition.

# Healthcare in 2050: The Dual Realities of Climate Change

## Assessment

**Formative:** During the activity, students receive feedback from the facilitator and peers on the depth of analysis, quality of proposed actions, and articulation of ideas.

**Summative** (optional); Groups can be marked on their class presentation or provide a written report with reference to the following criteria:

- Depth of scenario analysis
- Clarity and feasibility of proposed actions
- Structure, clarity and professional presentation.

### Alignment with Planetary Health, Climate Change and Sustainable Healthcare Essential Knowledge and Skills Framework

**Domain 1:** ***The science of planetary health and climate change***

- Describes how climate change impacts environmental determinants of health, including air quality, food and water security.
- Outlines the impact of climate change on environmental disasters (e.g., extreme weather, floods, fires, extreme heat, sea level rise) locally, nationally and internationally.
- Describes how environmental conditions and climate change influence infectious and vector-borne disease prevalence.
- Communicates effectively with various stakeholders, including colleagues, healthcare consumers and policymakers, about the consequences of climate change for human health, in order to promote informed decision-making in healthcare.

**Domain 2:** ***Mitigation of the adverse impacts of healthcare on the environment***

- Discusses examples of the environmental impact of healthcare delivery and nursing practice.
- Discusses personal, interpersonal, organizational and political enablers and barriers to nurses' sustainable behaviours.
- Discusses the roles of nurses as change agents and advocates for environmentally sustainable healthcare practices.
- Advocates for minimisation and environmentally sustainable disposal of waste.
- Uses risk communication strategies to advocate for proactive action to address the impacts of climate change.

**Domain 3:** ***Adaptation to the actual and expected impacts of climate change on healthcare and health outcomes***

- Discusses how climate change affects the social and environmental determinants of health such as clean air, safe drinking water, food security and safe housing, especially for priority.
- Describes strategies nurses can use to support individuals and groups most at risk of climate impacts (such as air pollution, extreme temperatures, floods and fires), with particular attention to frail and elderly people, young children, pregnant women and those with pre-existing co-morbidities and/or disabilities populations.
- Outlines potential psychological responses and mental health impacts of climate change, including anxiety and stress.
- Discusses how healthcare settings can adapt models of care and resources to prepare for and manage.
- Provides evidence-based information and education to healthcare consumers and colleagues about preparing for, responding to and recovering from the effects of climate change climate-driven disasters.
- Applies knowledge and expertise to influence environmental policies and to advocate for solutions that build climate resilience.

## References

Ward, A., Honegger Rogers, H., Tulleners, T., Levett-Jones, T. (2024). Nursing in 2050: Navigating dual realities of climate change in healthcare. *Nursing Inquiry.* doi.org/10.1111/nin.12666

# Appendices

# Appendix 1:

## Media Reporting of Climate Change and Health Impacts

### Rating scale for critiquing the quality and accuracy of media reports

| Term | Explanation | Rating criteria |
|---|---|---|
| **Credibility** | Quality of the source, accuracy and clarity of the information presented. | **High:** Accurate information clearly presented, minimal bias, transparent fact-checking, reputable source, research-based, declares conflicts of interest (if relevant).<br>**Medium:** Somewhat accurate, some fact-checking, some bias, dubious source.<br>**Low:** Inaccuracies evident, minimal fact-checking, high degree of bias, conflict of interest with ownership of media outlet. |
| **Salience** | Importance given to both climate and health issues | **High:** Prominently features both climate and health as core topics and demonstrates the interconnections.<br>**Medium:** Includes relevant discussion but limited linkage between climate and health.<br>**Low:** Mentions climate and health issues in a limited way but does not highlight the link between climate and health. |
| **Valence** | Positive, negative, or neutral tone toward climate and health topics. | **Positive:** Portrays climate/health topics in a constructive light, focusing on solutions or benefits.<br>**Neutral:** Objective but without an overtly positive or negative stance.<br>**Negative:** Emphasises adverse impacts or challenges, potentially creating concern or anxiety. |
| **Emotional impact** | Feelings elicited by the article (e.g., hope, fear) and its influence on readers' emotional responses (e.g., stress, fear, reassurance). | **High Impact:** Strongly affects emotions<br>**Moderate Impact:** Engages emotions or prompts reflection without extreme responses.<br>**Low Impact:** Minimal emotional influence. |
| **Tone** | Style of the article and how it shapes interpretation, such as factual or exaggerated. | **Minimal:** Balanced tone, objective, factual and unbiased.<br>**Neutral:** Neutral tone, mainly factual.<br>**Sensationalist:** Exaggerated language, designed to provoke strong reactions. |

# Appendix 2:

## Media Reporting of Climate Change and Health Impacts

### Example of infographic

# Appendix 3:

## Planetary Health Blogs for Priority Populations

### Example Rubric

| Criteria | Fail | Pass/Credit | Distinction | High Distinction |
|---|---|---|---|---|
| **Format** | Blog is unclear or rambling. Sequence of posts does not follow unit or course topics. | Blog is somewhat clear and logical. Sequence of posts mostly aligns with unit or course topics. | Blog is generally clear and logical. Sequence of posts generally aligns with unit or course topics. | Entire blog is clear and logical. Sequence of posts obviously aligns with unit or course topics. |
| **Content knowledge** | Blog demonstrates a lack of grasp of the content; posts are irrelevant to topic. | Blog demonstrates a grasp of basic concepts; posts are somewhat relevant to topic. | Blog demonstrates a solid grasp of relevant concepts; posts are generally relevant to topic. | Blog demonstrates exceptional knowledge of the unit or course content; delivered in clear, concise posts. |
| **Mechanics** | Blog has spelling and grammatical errors. | Blog has some incorrect spellings and/or grammatical errors. | Blog includes mostly correct spelling and grammar. | Entire blog is well conceived; appropriate discipline/domain-specific language used; inconsequential spelling and grammar errors. |
| **Structure of ideas** | Blog has no connection to the unit or course structure and content. | Blog has some connection to unit or course structure and content. | Blog has a strong connection to the unit or course structure and content. | All or almost all of the blog has an obvious and clear connection to the unit or course structure and content. |
| **References** | Blog has no references or reference list. | References are missing from some of the blog or not listed at the end of the blog. | Blog contains relevant and recent references; referencing generally accurate. | Blog includes critically evaluated references; referencing accurate. |

# Appendix 4:

## Interactive Oral Assessment: Climate Challenge - Carbon Literacy Course

### Marking Criteria

| Criteria | Fail | Pass | Credit | Distinction | High Distinction |
|---|---|---|---|---|---|
| **Understanding of climate science and planetary health concepts** | Demonstrates minimal or inaccurate understanding; key terms (e.g. global warming, greenhouse gas emissions, carbon footprint) are missing or misunderstood. | Demonstrates basic understanding; some key terms explained with limited depth or clarity. | Demonstrates clear understanding of key terms and basic scientific principles; links to climate change causes. | Demonstrates strong understanding; explains key terms and basic principles accurately, including human contributions to climate change. | Demonstrates comprehensive, sophisticated understanding of climate science and planetary health; clearly articulates interdependence of human and environmental health. |
| **Health impacts of climate change** | Limited or inaccurate explanation of impacts on human health, ecosystems, or vulnerable populations. | Provides basic description of health and environmental impacts; examples limited or generalised. | Describes health impacts accurately, including some environmental determinants and vulnerable populations. | Explains health impacts clearly, with detailed examples of environmental determinants, vulnerable populations, and healthcare relevance. | Provides in-depth, evidence-informed explanation of health impacts at individual, community, and systems levels; demonstrates insight into implications for healthcare practice. |
| **Application to clinical practice and solutions** | No or unrealistic link to clinical practice; solutions not discussed. | Basic connection to clinical practice; some general solutions mentioned. | Demonstrates practical application to clinical practice; identifies some strategies to mitigate climate impacts. | Provides clear, practical, and evidence-informed application to clinical practice; outlines feasible strategies for action. | Provides comprehensive, innovative, and evidence-based application to clinical practice; demonstrates leadership in promoting sustainable practices and climate literacy. |
| **Communication and professional presentation** | Communication unclear, unprofessional, or disorganised; unable to respond to questions. | Communicates ideas clearly at a basic level; responds to some questions; limited structure. | Clear, professional communication; structured response; demonstrates understanding of course content; answers questions appropriately. | Confident, structured, and professional communication; effectively conveys understanding and engages the assessor; responds thoughtfully to questions. | Highly professional, articulate, and engaging communication; presents information clearly, confidently, and persuasively; demonstrates sophisticated understanding; responds critically and insightfully to questions. |

# Appendix 5:

## Net Zero Inservice Presentation

### Marking Criteria

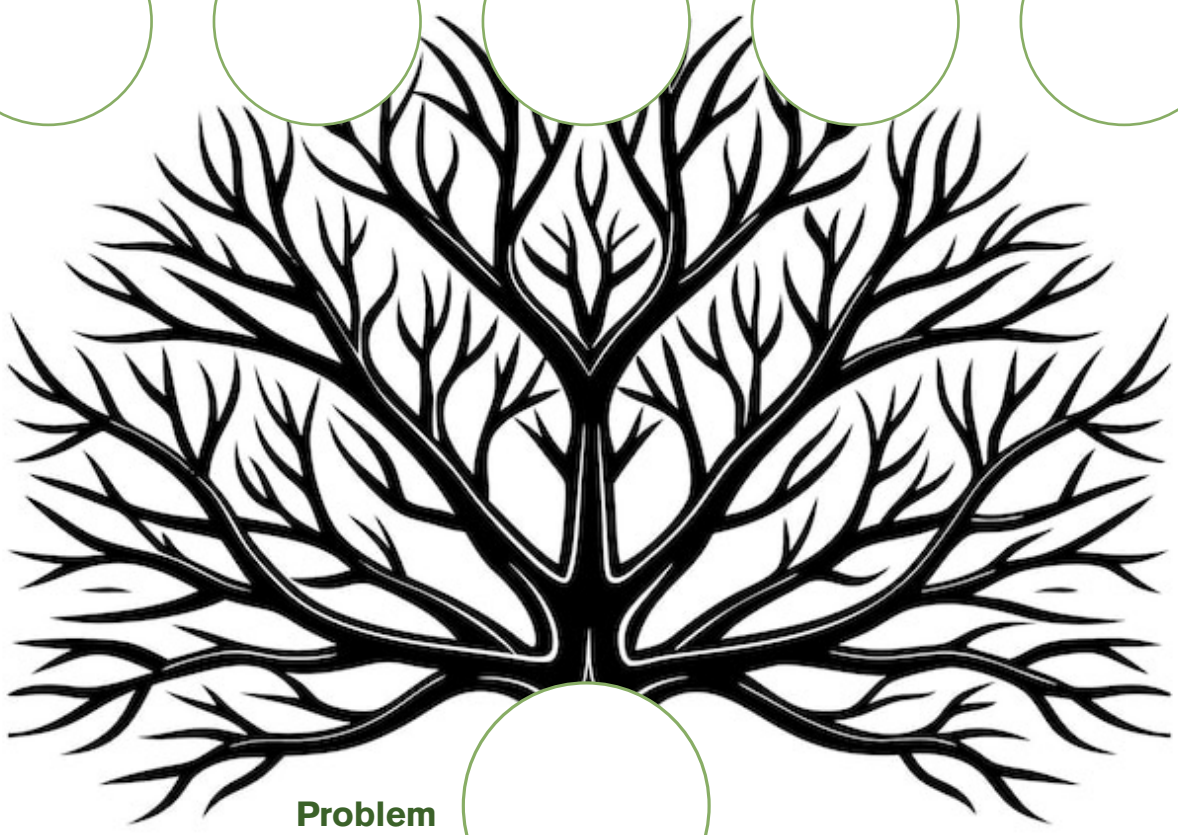
| Criteria | Fail | Pass | Credit | Distinction | High Distinction |
|---|---|---|---|---|---|
| **Understanding of planetary health and health consequences of unsustainable environments** | Minimal or inaccurate understanding of planetary health or health impacts of unsustainable environments; key concepts such as climate change, global warming, greenhouse gas emissions, are missing or misunderstood. | Basic understanding, identifies some planetary health concepts and health consequences, but explanations lack depth or accuracy. | Adequate understanding; explains key planetary health concepts (climate change, carbon footprint) and health impacts with some examples; limited linkage to human-environment interdependence. | Strong understanding; clearly explains planetary health, climate change, and the interdependence of human and environmental health with supporting examples; links to healthcare practice. | Excellent and insightful understanding; integrates multiple planetary health concepts, links to human and environmental health interdependence, and demonstrates sophisticated insight into implications for healthcare. |
| **Explanation of 'net zero' and healthcare system contributions** | Definition of net zero inaccurate or missing; no link to healthcare system emissions. | Basic explanation of net zero; limited connection to healthcare system contribution to emissions. | Clear explanation of net zero and some discussion of healthcare's role in greenhouse gas emissions. | Detailed explanation of net zero with strong linkage to healthcare system emissions; demonstrates understanding of sustainable practices in healthcare. | Comprehensive, evidence-informed explanation of net zero and healthcare system contributions to emissions, highlighting implications for sustainability and planetary health. |
| **Exploration of chosen priority area (healthcare, energy, supply chain, etc.)** | Limited or inaccurate discussion; relevance to planetary health or sustainable healthcare unclear. | Basic description of the priority area with minimal connection to planetary health or sustainability. | Describes the priority area with some links to planetary health principles, environmental determinants of health, and sustainable healthcare. | Thorough and accurate exploration of the priority area; integrates planetary health principles, climate impacts, and environmental determinants of health. | In-depth, critical, and evidence-based exploration; demonstrates sophisticated understanding of the priority area's role in promoting sustainable healthcare and planetary health outcomes. |
| **Ward/Unit initiative (objectives, strategies, outcomes)** | Initiative missing, unrealistic, or unrelated to planetary health or sustainability; objectives, strategies, and outcomes unclear. | Basic initiative; limited feasibility or limited linkage to sustainability or planetary health; objectives, strategies, and outcomes outlined superficially. | Feasible initiative that aligns with the priority area; incorporates some sustainability principles and basic planetary health concepts; objectives, strategies, and outcomes reasonably clear. | Well-structured and feasible initiative; integrates sustainability and planetary health principles; objectives, strategies, and anticipated outcomes are clear and realistic. | Highly innovative and practical initiative; deeply grounded in planetary health principles; objectives, strategies, and outcomes are evidence-informed, measurable, and aligned with sustainable healthcare practice. |
| **Professional communication and dissemination of evidence** | Communication unprofessional, disorganised, or fails to present evidence; does not convey planetary health concepts. | Communicates clearly at a basic level; limited use of evidence; some planetary health concepts presented. | Clear communication; uses evidence appropriately; presents key planetary health and climate change concepts effectively. | Professional and well-structured communication; strong use of evidence; conveys planetary health concepts clearly; engages peers effectively. | Highly professional, confident, and engaging communication; excellent use of scientific evidence; effectively disseminates planetary health and climate change knowledge; demonstrates leadership in educating peers. |

# Appendix 6:

## Root Cause Analysis Tree

**Solutions**

**Consequences**



**Problem**

**Root causes**

# Appendix 7:

## Beyond Habit: Rethinking Personal Protective Equipment Use

### Standard Precautions: PPE Quick Reference Guide

This visual guide outlines common types of Personal Protective Equipment (PPE) used in standard precautions, along with when each item should be used based on potential exposure risks*.

| PPE Item | When to Use | Examples |
|---|---|---|
| Gloves | When there is a risk of contact with blood, body fluids, mucous membranes, non-intact skin, or contaminated surfaces. | Drawing blood<br>Wound care<br>Handling specimens<br>Cleaning contaminated equipment |
| Surgical Mask | When there is a risk of splash/spray or when working close to a patient with respiratory symptoms. | Coughing<br>Routine oral suctioning such as post operative recovery |
| Protective Eyewear/ Face Shield | When there is a risk of splash/spray to the face, eyes, nose, or mouth. | Airway suctioning<br>Wound irrigation<br>Assisting with childbirth |
| Gown/Apron | When clothing or skin may come into contact with blood, body fluids, secretions, or excretions. | Incontinence care<br>Cleaning spills<br>During procedures with expected splash |
| Hand Hygiene | 1) Before and after all patient contact,<br>2) before clean or aseptic procedures,<br>3) after exposure to body fluids,<br>4) after touching a patient, and<br>5) after touching the patient's surroundings, following the Five Moments for Hand Hygiene (WHO). | Before and after patient contact<br>After glove removal<br>After touching patient surroundings<br><br>**Key Point:** Intact skin provides effective protection against infection. Check your hands regularly for cuts, dermatitis, or damage. Compromised skin increases personal risk and requires immediate management. |

*Standard precautions for the prevention and control of infections: Aide memoire. www.who.int/publications/i/item/WHO-UHL-IHS-IPC-2022.1

# Appendix 8:

## Beyond Habit: Rethinking Personal Protective Equipment Use

### Exemplar: Decision Making Tool for PPE Risk Assessment (Standard Precautions)

- This flowchart supports clinical decision-making for selecting and using PPE under Standard Precautions. It provides a structured approach for assessing risk and determining appropriate protective equipment based on potential exposure and task type.
- **Procedure-Specific Notes:** Some procedures always require PPE or aseptic technique under Standard Precautions: chemotherapy administration, central line access, surgical procedures, complex wound care, aseptic dressing changes.
- Refer to facility policy and clinical guidelines for specific PPE and technique requirements.

**Start: Assess the task or procedure**

↓

Is there potential exposure to blood, body fluids, secretions, excretions, or non-intact skin?
(examples: wound care or dressing changes, handling blood samples, removing IVs or drawing blood, oral or tracheal suctioning, toileting or incontinence care, assisting with vomiting or bleeding episode)

→ No: perform hand hygiene.

↓ Yes

Is there a risk of splash or spray to the face (eyes/nose/mouth)?

→ Yes: Add mask and eye/face protection.

↓ No

Is there a risk of contamination of clothing or skin?

→ Yes: Add gown/apron.

↓ No

Is contact with blood/body fluids or contaminated surfaces likely?

→ Yes: Wear gloves (+ apron if contamination likely).

→ No: perform hand hygiene.

**Always perform hand hygiene before and after PPE use.**
**Replace if soiled or damaged.**

**Note:** If suspected or confirmed high-risk pathogen or emergency response, apply Transmission-Based Precautions in addition to Standard Precautions.

# Appendix 9:

## Beyond Habit: Rethinking Personal Protective Equipment Use

## Scenarios

### Student instructions

For each scenario, complete the following tasks.

1. Read the scenario carefully.
2. Apply your decision tool to each of the clinical tasks listed to determine whether glove use is indicated.
3. List other Standard Precautions that need to be implemented during care delivery.
4. Note any patient-specific or policy factors that influence your decision.
5. Reflect on the environmental impact of PPE use for the scenario (estimate how much PPE needs to be used).

***Note** - where you recommend PPE for a task- stipulate type.

### Scenario 1

**Patient:** Mr Singh. (68 y/o) admitted with community-acquired pneumonia. Peripheral IV cannula (18G) in right dorsal hand, inserted 24 hours ago. Cannula site: clean, dressing intact, no blood or leakage.

**Required Care:** Current orders: IV ceftriaxone 1 g once daily (prepared from vial; bolus over 5 minutes). Patient is mildly dependent for personal care and will need a bed bath and help with dressing. He is continent but reports occasional and slight urine incontinence at night.

**Clinical tasks:**

1. Prepare IVAB in medication room.
2. Walk to bedside, check cannula, scrub port with alcohol swab, connect syringe and administer IVAB as a bolus.
3. Help patient with a bed bath (upper torso, arms) and dressing.
4. Provide perineal care after patient reports light urine incontinence.

### Scenario 2

**Patient:** Mrs Boskowny (55 y/o) admitted with subacute cholecystitis scheduled for laparoscopic cholecystectomy this afternoon. She is hemodynamically stable. No known infection or wound present.

**Required Care:** Routine vital signs (T, BP, HR, RR, $SpO_2$); 75 mg IM diclofenac; then prepare patient and transport to operating theatre (assist transfer from bed to trolley, manage IV pole).

**Clinical tasks:**

1. Perform routine observations (vital signs).
2. Give an IM injection of diclofenac into lateral thigh (clean skin, single IM syringe).
3. Transfer patient to theatre trolley and escort to theatre.

### Scenario 3

**Patient:** Mr. Tan (72 y/o) admitted with heart failure exacerbation. He has a urinary catheter in situ and is on oral diuretics. He is alert and self-caring, however requires assistance x 1 with mobility. No open wounds or invasive lines. He states he needs to open his bowels.

**Required Care:** assist patient to toilet; measure and empty urine from catheter bag; administer oral furosemide; take routine observations (BP, HR, $SpO_2$, Temp).

**Clinical tasks:**

1. Assist patient to toilet.
2. Measure and empty catheter bag.
3. Administer oral medication.
4. Perform routine vital signs.

### Scenario 4: Advanced Learners

**Patient:** Ms Cluney. (54 y/o) post-op colorectal resection, day 3. She has a tunnelled central venous catheter (CVC) in the right subclavian region and an abdominal Medi-vac drain (suction bottle) with serosanguinous output. Overnight the dressing over the CVC is found saturated with blood and visible seepage at the catheter exit site. The Medi-vac drain below the wound has been disconnected and there is fluid on the bedside sheet. The patient is febrile and slightly hypotensive.

**Clinical tasks:**

1. Remove saturated CVC dressing, assess exit site, manage active seepage (apply pressure, dress).
2. Clean and re-dress the CVC site using an aseptic dressing change.
3. Contain and dispose of the Medi-vac drain fluid spill and replace the drain tubing connection.

# Appendix 9:

## Beyond Habit: Rethinking Personal Protective Equipment Use

## Possible Answers

### Scenario 1

**Tasks**

1. Prepare IVAB (med room):
   **Checklist:** No anticipated contact with blood/body fluids, no contamination expected, not manipulating of vascular line.
   **Action:** PPE not required.
   **Teaching Point:** medication reconstitution in clean area — scoping review supports no routine non-sterile gloves for IVAB prep.

2. Administer IVAB at bedside (connect syringe to port; scrub hub):
   **Checklist:** Routine vascular line manipulation without visible leakage
   **Action:** PPE not required. If blood return occurs or visible soiling, reassess.

3. Bed bath & dressing (upper body/intact skin):
   **Checklist:** Touching intact skin and changing linen, no body fluids anticipated.
   **Action:** PPE not required.

4. Perineal care (after incontinence):
   **Checklist:** Contact with body fluids (urine/faeces) anticipated
   **Action:** Gloves required as there is potential contact with urine or other body fluids, including soiled linen. Ensure healthcare professional follows 5 Moments for Hand Hygiene. Plastic apron or gown recommended if there is a risk of splashing or soaking of clothing during care. Eye protection and mask only if there is a reasonable risk of splashes to the face (e.g., patient agitation, high-pressure urine flow).

**Teaching points**

Emphasise difference between touching intact skin vs contact with body fluids; highlight hand hygiene remains central.

Ask students to estimate glove pairs saved by not wearing gloves for steps 1–3.

Ensure all aspects of standard precautions are captured by the learner. Remind students that glove use is just one part of Standard Precautions.

**Rationale**

Standard precautions require a risk assessment before each interaction. If exposure to blood or body fluids is likely, appropriate PPE must be worn to protect skin and mucous membranes

### Scenario 2

1. Vital signs:
   **Checklist:** No anticipated contact with blood/body fluids; intact skin contact only.
   **Action:** PPE not required.

2. IM injection (clean skin, no anticipated bleeding):
   **Checklist:** No anticipated contact with blood/body fluids. Procedure involves skin puncture but no anticipated contact with blood or body fluids beyond small capillary seepage; routine guidance.
   **Action:** PPE not required (local policy may vary).
   Teaching Point: If bleeding occurs at injection site, then don gloves before managing bleed, dispose, and apply hand hygiene.

3. Transport to theatre (transfer):
   **Checklist:** No anticipated contact with blood/body fluids Routine manual handling / contact with intact clothing/skin.
   **Action:** PPE not required.

**Teaching points**

Use the IM injection to discuss clinician choice vs guidelines: when are gloves optional vs necessary. Emphasise availability of gloves immediately if bleeding/soiling occurs. PPE is based on the likelihood of exposure to blood or body fluids. If the risk is minimal, hand hygiene is the primary precautionary measure.

# Appendix 9:

## Beyond Habit: Rethinking Personal Protective Equipment Use

## Possible Answers

### Scenario 3

1. Assist to toilet: Patient is self-caring.
   **Checklist:** No Routine manual handling / contact with intact clothing/skin.
   **Action:** PPE not required

2. Measure and empty catheter bag
   **Checklist:** Contact with body fluids (urine/faeces) anticipated
   **Action:** Gloves required. Eye protection required as there is a reasonable risk of splashes to the face. Mask: If splashes to the mouth or nose are possible.

3. Administer oral medication.
   **Checklist:** No anticipated contact with blood/body fluids.
   **Action:** PPE not required

4. Vital signs:
   **Checklist:** No anticipated contact with blood/body fluids; intact skin contact only.
   **Action:** PPE not required

**Teaching points**

Use the 'assist to toilet for a self-caring person' to question students as to why healthcare professionals wear gloves when not clinically indicated? Is it out of (unnecessary) habit? Remind students that PPE is based on the likelihood of exposure to blood or body fluids. If the risk is minimal, hand hygiene is the primary precautionary measure.

### Scenario 4

1. Remove saturated dressing/manage active seepage:
   **Checklist:** Anticipated contact with blood/body fluids
   **Action:** PPE required. Don non-sterile gloves before contact to protect staff and prevent contamination. If heavy bleeding and an aseptic procedure is not being performed, non-sterile gloves are appropriate for initial control.

2. Aseptic dressing change of CVC:
   **Checklist:** Procedure breaches an aseptic field; requires sterile field and prevention of catheter contamination.
   **Action:** Sterile gloves required (and full aseptic technique: don sterile gloves after hand antisepsis, use sterile dressings and equipment). Explain difference: sterile gloves are used to preserve asepsis for invasive devices; non-sterile gloves protect from contamination but do not provide aseptic field.

3. Contain Medi-vac drain spill & replace tubing connection:
   **Checklist:** Visible contamination with body fluids
   **Action:** Gloves required. Don non-sterile gloves to contain spill. Eye protection (goggles or face shield): Recommended if there is a risk of splashing during removal or cleaning. Mask: If splashes to the mouth or nose are possible.

   Medi-vac drains contain serosanguinous or purulent fluid, which poses a risk for bloodborne pathogens and could be under pressure or vacuum causing spraying. The principle is to protect skin and mucous membranes whenever exposure is likely

**Teaching points**

Use this scenario to highlight when non-sterile gloves protect staff and environment, and when sterile gloves are required to protect devices/patients. Discuss how appropriate glove selection mitigates infection risk while being mindful of resource use.

# Appendix 10:

## Sustainable Wound Care: Good for Patients, Good for the Planet

### Four Principles of Sustainable Healthcare Template with Model Answers

**1. Prevention –** promoting health and preventing disease by addressing the causes and inequalities of healthcare. This includes minimising the need for healthcare through early intervention and health promotion activities.

**What is the reason for Ms Henderson needing medical treatment?**
Daily dressings for venous leg ulcer, excessive exudate.

**What comorbidities does Ms Henderson have?**
Cardiovascular disease, diabetes, obesity, and depression. These are strongly linked to wound healing. Climate change can worsen or complicate the management of Mrs Henderson's chronic conditions, for example, rising temperatures impacting glucose control due to dehydration and reduced physical activity. Aberrations in glucose control delay wound healing.

**What factors that may contribute to health inequality for Ms Henderson?**
Mrs Henderson lives in rural town with limited access to range of healthcare services such as specialists. Addressing inequalities requires a shift toward equitable care models, such as community outreach, mobile wound care services, or telehealth support, reducing both environmental impact and health disparities.

**How may have climate change be linked with Ms Henderson's comorbidities, current problems and health inequalities.**
Warmer temperatures discourage walking – this in turn impacts glucose control and psychological wellbeing. Climate-related stress, isolation during extreme weather, and reduced mobility can intensify feelings of loneliness and low mood, hindering recovery and self-care motivation. Extreme temperatures contribute to production of exudate causing the surrounding tissue to become further macerated and extending the wound edges.

**2. Patient Empowerment and Self Care –**
Empowering people to take a greater role in managing their own health and healthcare. This includes self-management, informed decision-making, and shared responsibility for health.

**How can Ms Henderson's comorbidities be better managed?**
Preventive strategies such as weight management, improved glycaemic control, compression therapy, physical activity, and psychosocial support could reduce ulcer recurrence and severity. Education on self-care techniques, supported by community-based or telehealth interventions, could empower Ms Henderson to manage aspects of her condition at home, minimising unnecessary clinic visits and associated emissions.

**How can healthcare professionals incorporate climate adaptation and sustainability principles into Ms Henderson's wound management plan?**
Planetary health diet may be of use, including plant-based protein and carbohydrate sources.

**How can Ms Henderson's comorbidities be better managed?**
Analysing current wound care treatment compared to evidence based practice for treatment of venous leg ulcers. Use of evidence-based care will promote healing, in turn reducing dressings required therefore reducing environmental impact while improving Ms Henderson's quality of life.

# Appendix 10:

## Sustainable Wound Care: Good for Patients, Good for the Planet

### Four Principles of Sustainable Healthcare Template with Model Answers

**3. Lean Service Delivery –** Streamlining care to minimise wasteful activities. This includes reduced waste, inefficiencies and unnecessary use of resources.

**What treatment is currently being provided to Ms Henderson? How is the current treatment a source of environmental impact?**
Daily dressings. Possibly driven by habit or lack of evidence-based protocols, leading to unnecessary use of resources. Environmental impact from dressings with exudate, new daily dressings, packaging etc contributing to waste.

**What inefficiencies or duplication of services exist?**
Each visit involves use of single-use dressings, packaging materials, clinical waste disposal, and travel to and from the clinic.

**How is the treatment currently being delivered and what is the environmental impact?**
Ms Henderson attends the clinical each day driving 30 minutes each way – this contributes to carbon emissions.

**What strategies could be implemented to improve efficiency?**
The current dressing regime is not in line with evidence-based care for venous leg ulcers which support the use of compression bandages. Use of evidence-based care will promote healing, in turn reducing the number of dressings required and the environmental impact while improving Ms Henderson's quality of life.

Ms Henderson could be supported with education to perform some wound care at home.

**4. LOW CARBON ALTERNATIVES –** selecting treatments with a lower environmental impact. This includes a focus on reducing the environmental footprint of healthcare delivery.

**What evidence-based care solutions are required? How can evidence based care reduce environmental impact?**
Evidence based dressings improves wound healing and decreases use of materials through more efficient and appropriate care. This has the potential to minimise travel emissions by lengthening time between appointments.

**Are there sustainable alternatives or practices that could be implemented?**
Optimise dressing regime and ensure evidence-based care. Compression bandaging is the gold standard for venous leg ulcers. Change dressings as clinically indicated (rather than routine daily change. This reduces overuse of dressings, packaging, and waste disposal.

Mrs Henderson would need to be educated on how to care for the bandages with consideration to environment (eg. wash at a low temperature; use non-biological detergent; air-dry bandages. This will also increase the lifespan of the compression bandages).
Explore biodegradable and lower impact dressings.
Explore options for reusable instruments or containers rather than single-use plastics. No requirement for sterile saline and opening a new bottle with every dressing change – potable water is more appropriate.

**In what ways could holistic care (nutrition, exercise, social connection) improve Ms Henderson's healing and reduce environmental impact?**
Adequate nutrition is essential for tissue repair and immune function. Sue's current reliance on takeaway and processed foods likely limits her intake of protein, vitamins (A, C, E), zinc, and iron — all of which are critical for wound healing. A diet rich in fresh fruits, vegetables, lean proteins, and whole grains would improve collagen synthesis, reduce inflammation, and promote immune competence. Locally grown, seasonal produce reduces food packaging, transportation emissions, and waste associated with processed meals

Although walking currently causes Sue embarrassment due to odour, maintaining mobility is vital. Moderate physical activity improves circulation and venous return, reducing oedema and promoting wound oxygenation. Gentle leg exercises, ankle pumps, and short daily walks (perhaps at quieter times) would support venous flow and tissue perfusion. Re-engaging in active transport (walking) instead of driving daily to the clinic—if remote wound monitoring or community nurse visits were implemented—could reduce fuel use and carbon emissions.

Sue's isolation and withdrawal from social activities can lead to depression and reduced motivation for self-care. Social connection can support psychological resilience, adherence to wound care, and healthier lifestyle choices.

# Appendix 11:

## Planetary Health Puzzle Challenge

**Eco Health puzzle pack and instructions for educators**

- Print and cut out a full set of cards for each group, preferably using different coloured paper (e.g., blue = planetary health factors, green = health impacts, yellow = scenarios, orange = clinical responses).
- Shuffle cards within each category and place them face down on separate piles.
- Divide students into small groups (4–5 per group).
- Each group draws one Scenario Card and must find the correct Planetary Health Factor, Health Impact, and Healthcare Response cards that match.
- Groups present their solutions and reasoning to the class.

**Challenge cards (real-world scenarios)**

1. A rural community experiences an outbreak of dengue after heavy rainfall and flooding.
2. Children in an urban area show rising rates of asthma due to vehicle emissions and poor air quality.
3. A farming community faces food shortages after a prolonged drought.
4. After a cyclone, displaced families are living in crowded shelters with poor sanitation.
5. An urban hospital generates high amounts of single use plastic waste daily.
6. Elderly residents show signs of anxiety and depression following a bushfire disaster.

**Planetary Health cards (environmental drivers)**

1. Climate change → increased rainfall and flooding.
2. Air pollution → vehicle emissions, industrial smoke.
3. Biodiversity loss and land degradation.
4. Extreme weather events → cyclones, bushfires.
5. Unsustainable healthcare practices → excessive waste and energy use.
6. Environmental degradation → destruction of green spaces, loss of community resilience.

**Health Impact Cards (human health outcomes)**

1. Increase in vector-borne diseases (e.g., dengue, malaria).
2. Higher incidence of respiratory illnesses (e.g., asthma, COPD).
3. Food insecurity and malnutrition.
4. Spread of communicable diseases (e.g., diarrhea, cholera).
5. Increased hospital-acquired infections and ecosystem contamination.
6. Mental health problems (e.g., stress, anxiety, PTSD).

**Health Professional Response Cards (practical actions)**

1. Provide community health education on mosquito control and preventive behaviours.
2. Advocate for clean air policies and educate families about respiratory protection.
3. Support nutrition programs and educate on climate-resilient crops/foods.
4. Implement hygiene education, vaccination campaigns, and safe water practices.
5. Promote waste reduction strategies and sustainable healthcare initiatives.
6. Offer psychosocial support, counselling, and connect patients with mental health services.

**Bonus Advocacy Cards (optional – for advanced groups)**

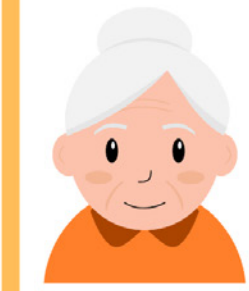
1. Write a letter to local council/MP advocating climate-resilient health policies.
2. Develop a community disaster-preparedness workshop.
3. Propose sustainable energy initiatives for hospitals.

Partner with Indigenous leaders to integrate traditional knowledge in disaster response.

# Appendix 12:

## Impact and Action: Planetary Health Card Game

**Mei**
**88 year old female**



**Bruce**
**54 year old male**

**Daniel**
**29 year old male**

**Fatima**
**34 year old female**

**Sam**
**38 year old male**

**Jacob**
**45 year old male**

**Lily**
**7 year old female**

**Amina**
**27 year old female**

**George**
**82 year old male**

# Appendix 12:

## Impact and Action: Planetary Health Card Game

### Daniel

- Wheelchair due to spinal injury
- Lives in supported housing
- Part time care
- Needs medical equipment

### Bruce

- Owns own small cattle farm
- Regional
- Ongoing drought affected income/ mental health
- Delays healthcare due to distance

### Mei

- Lives in an aged care facility
- Has dementia
- Relies on staff
- Limited staff during emergencies

### Jacob

- Lives remote
- Deep connections to country
- Works with local land management projects
- Limited access to healthcare

### Sam

- Sleeping rough in the city
- No regular GP
- Stuggles with food insecurity
- Needs emergency shelter during extreme weather

### Fatima

- Recent asylum seeker
- Temporary housing
- 2 children
- Limited English
- No healthcare
- Previous trauma

### George

- Lives alone in small suburban home
- Has COPD
- Limited mobility
- Relies on home O2 and community health

### Amina

- 28 weeks pregnant
- Lives 2 hours from hospital
- Limited pre-natal care
- Family farm relies on rainfall

### Lily

- Lives with parents in a city appartment near busy highway
- Has asthma
- Uses daily inhaler
- Attends local primary school

# Appendix 12:

## Impact and Action: Planetary Health Card Game

**Heatwave**

**Bushfire Smoke**

**Flooding**

**Cyclone**

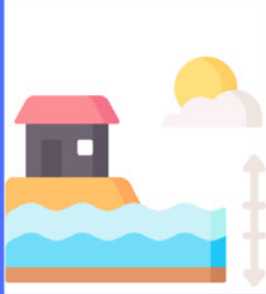
**Air Pollution**

**Water Shortages**

**Food Insecurity**

**Vector-Bourn Disease**

**Displacement**



# Appendix 12:

## Impact and Action: Planetary Health Card Game

| Flooding | Bushfire Smoke | Heatwave |
|---|---|---|
| Heavy rainfall has caused flash flooding.<br><br>Roads are blocked and some homes and buisnesses are inaccessible. | A large bushfire has prompted evacuations.<br><br>Thick smoke is spreading across the area, reducing air quality. | A record breaking heatwave had struck - lasting for 5 days.<br><br>Power outages have affected air conditioning |
| **Water Shortages** | **Air Pollution** | **Cyclone** |
| A prolonged drought has led to water restrictions.<br><br>Safe drinking water is now difficult to access for the community. | There is poor air quality due to pollution.<br><br>Those with respiratory conditions advised to stay inside. | A severe cyclone has damages infrastructure.<br><br>It has disrupted water and electricity supplies. |
| **Displacement** | **Vector-Bourn Disease** | **Food Insecurity** |
| Sea levels have started to rise.<br><br>Families are forced to relocate, straining shelters and evacuation centres. | There has been a rise in mosquito populations after recent heavy rains.<br><br>Ross River virus and dengue fever are on the increase. | Crop failures have led to local food shortages.<br><br>People have lost their incomes and the price of food is increasing. |

# Appendix 12:

## Impact and Action: Planetary Health Card Game

# Appendix 12:

## Impact and Action: Planetary Health Card Game

**WILDCARD**

The power lines have been cut in a storm!

The power has failed without warning.

**WILDCARD**

A flash flood has washed out the only roads in and out of the town - you can not reach any services.

**WILDCARD**

The phone and internet have gone down. All internet and phone based services collapse.

**WILDCARD**

A massive storm has hit.
The local hospital has reached capacity, but you require help.

**WILDCARD**

A bushfire is approaching.

Authorities advise you have five minutes to evacuate.

**WILDCARD**

A cyclone stikes, The SES are overwhelmed and can't get to you.
Your roof has collapsed.

**WILDCARD**

There's a storm surge, resulting in flooding where you're staying. Emergency services can't get to you.

**WILDCARD**

The cyclone has passed, but the power is out to all the water treatment facilities.

**WILDCARD**

Flooding to the area means no medication, food or equipment.
You have run out of your medication.

# Appendix 12:

## Impact and Action: Planetary Health Card Game

**Action Card**

Provide immediate stabilisation care to one patient

**Action Card**

Evactuate one patient to safety

**Action Card**

Secure one patient's basic needs

**Action Card**

One patient is able to access health services

**Action Card**

One patient is provided support for their mental health

**Action Card**

One patient is able to engage community support services

**Action Card**

One patient is able to have a healthcare worker advocate for resources

**Action Card**

One patient is able to be protected from an environmental exposure

**Action Card**

Emergency services are able to distribute medication to one patient

# Appendix 13:

## Impact and Action: Planetary Health Card Game

### Impact & Action
### Take-Home Reflection Sheet

#### 1. Key Insights

Reflect on your participation in the card game:

- One thing I learned about the impact of climate or environmental events on vulnerable populations.
- One thing I learned about the role of nurses or healthcare workers in responding to planetary health challenges.

#### 2. Decision-Making & Triage

- Describe a situation where you had to prioritise one patient over another:
- What factors influenced your decision? (e.g., health status, environmental risk, resources available)

# Appendix 13:

## Impact and Action: Planetary Health Card Game

### 3. Reflection on Actions

- Which action card(s) did you think were most effective, and why?
- How could these actions be applied in a real-world healthcare setting?

### 4. Advocacy

- How could nurses or healthcare workers advocate for systemic or community-level changes to reduce planetary health risks?
- Identify one advocacy action you could take as a future health professional.

### 5. Personal Application

Think about connecting your learning to your practice:

- One thing I will take from this activity to my future practice.
- One question I still have about planetary health or sustainable healthcare.

# Glossary

**Adaptation:** In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.

**Adaptation strategies:** An adaptation strategy is a program, project or approach that has been developed to respond to anticipated climate change impacts in a specific area of potential concern.

**Anthropocene:** A proposed new geological epoch resulting from significant human-driven changes to the structure and functioning of the Earth system, including the climate system.

**Antimicrobial stewardship:** An ongoing effort by a health service organisations to optimise antimicrobial use among patients to improve patient outcomes, ensure cost-effective therapy and reduce adverse sequelae of antimicrobial use (including antimicrobial resistance).

**Climate anxiety:** Distress about climate change and its impacts on the landscape and human existence.

**Climate change:** A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

**Climate-related extreme weather events:** hydrometeorological events (storms, floods, wet mass movements) and climatological events (extreme temperature, drought, wildfire).

Climate resilience: Capacity of social, economic and ecosystems to d anticipate, withstand, adapt to, and recover from climate-related events or trends.

**Carbon footprint:** Measure of the total amount of emissions of carbon dioxide (CO2) directly and indirectly caused by an activity over the lifecycle stages of a product. Climate justice: Justice that links development and human rights to achieve a human-centred approach to addressing climate change, safeguarding the rights of the most vulnerable people and sharing the burdens and benefits of climate change and its impacts equitably and fairly.

**Carbon neutral:** Condition in which anthropogenic carbon dioxide (CO2) emissions associated with a subject are balanced by anthropogenic CO2 removals.

**Climate resilience:** Capacity of social, economic and ecosystems to cope with a hazardous event or trend or disturbance.

**Continuity of care:** Ensuring patients can access timely, appropriate care even during system disruptions (e.g., floods, heatwaves).

**Disaster:** A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic, and environmental losses and impacts.

**Disaster risk:** The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society, or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability, and capacity.

**Ecological determinants of health:** Interdependent relationships between physical, biological and psychosocial and environment factors that impact human health. Environmental determinants of health: Global, regional, national, and local environmental factors that influence human health, including physical, chemical, and biological factors external to a person, and all related behaviours' .

**Environmental sustainability:** The responsibility to conserve natural resources and protect global ecosystems to support health and wellbeing.

**Environmentally sustainable healthcare:** A health system that improves, maintains or restores health, while minimizing negative impacts on the environment and leveraging opportunities to restore and improve it, to the benefit of the health and well-being of current and future generations.

**Fossil fuels:** Carbon-based fuels from fossil hydrocarbon deposits, including coal, oil and natural gas.

**Global warming**: An increase in global surface temperature relative to a baseline reference period, averaging over a period sufficient to remove interannual variations (e.g., 20 or 30 years).

**Health co-benefits:** Implementation of climate policies that lead to both cost savings and improvement in health.

**Indigenous Peoples:** Distinct social and cultural groups that share collective ancestral ties to the lands and natural resources where they live, occupy or from which they have been displaced. The land and natural resources on which they depend are inextricably linked to their identities, cultures, livelihoods, as well as their physical and spiritual wellbeing.

**Mitigation (of climate change):** A human intervention to reduce emissions or enhance the sinks of greenhouse gases (e.g., energy efficiency, waste reduction, sustainable procurement).

**Net Zero:** Condition in which anthropogenic carbon dioxide (CO2) emissions are balanced by anthropogenic CO2 removals over a specified period.

# Glossary

**Net zero greenhouse gas emissions:** Condition in which metric-weighted anthropogenic greenhouse gas (GHG) emissions are balanced by metric-weighted anthropogenic GHG removals over a specified period.

**Net Zero targets:** Commitment to 'cutting greenhouse gas emissions to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere, by oceans and forests for instance.

**One Health:** The interconnected relationship between the health of people, animals and ecosystems.

**Planetary boundaries:** Nine interdependent processes that regulate the Earth's stability and resilience; they include climate change, biodiversity loss, land system change, freshwater use, nitrogen and phosphorus cycles, ocean acidification, stratospheric ozone depletion, atmospheric aerosol loading and chemical pollution.

**Planetary health:** A solutions-oriented, transdisciplinary field and social movement focused on analysing and addressing the impacts of human disruptions to Earth's natural systems on human health and all life on Earth.

**Planetary health literacy:** Comprised of several parts including concepts of systemic, community and society-orientated literacy approaches such as ecological literacy, ecoliteracy and transformative literacy as well as models of health literacy.

**Policy ask:** A specific request to decision-makers for action, funding, or legislative change (e.g., funding for clinic retrofits to withstand extreme heat).

**Preparedness:** A sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning, stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises.

**Primary health care:** A whole-of-society approach that promotes health and wellbeing for all people through the integration of services, addressing the determinants of health, and empowering individuals and communities.

**Primary prevention:** Health promotion and disease prevention.

**Risk:** The combination of the probability of an event and its negative consequences. Risk communication: A process of sharing information and advice about climate related risks between various knowledge holders and decision makers, including researchers, technicians, assessors, managers, practitioners, members of the public, authorities, media, interest groups, etc.

**Secondary prevention:** Early detection through screening and surveillance, and early intervention.

**Social determinants of health:** Non-medical factors that influence health outcomes including the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life.

**Stakeholders:** Individuals or groups with an interest or role in healthcare and climate policy (e.g., patients, healthcare professionals, MPs, community organisations).

**Sustainable development:** Development that meets the needs of the present without compromising the ability of future generations to meet their own needs and that balances social, economic and environmental concerns.

**Tertiary Prevention:** Treatment, rehabilitation and responding to complications.

**United Nations Sustainable Development Goals:** The 17 global goals for development for all countries that were established by the UN through a participatory process and elaborated in the 2030 Agenda for Sustainable Development, including ending poverty and hunger; ensuring health and wellbeing, education, gender equality, clean water and energy and decent work; building and ensuring resilient and sustainable infrastructure, cities and consumption; reducing inequalities; protecting land and water ecosystems; promoting peace, justice and partnerships and taking urgent action on climate change. Waste segregation: The sorting and separation of waste types to facilitate recycling and correct onward disposal.

**Weather extremes:** Unusual weather events that are at the extremes of the historical distribution for a given area.