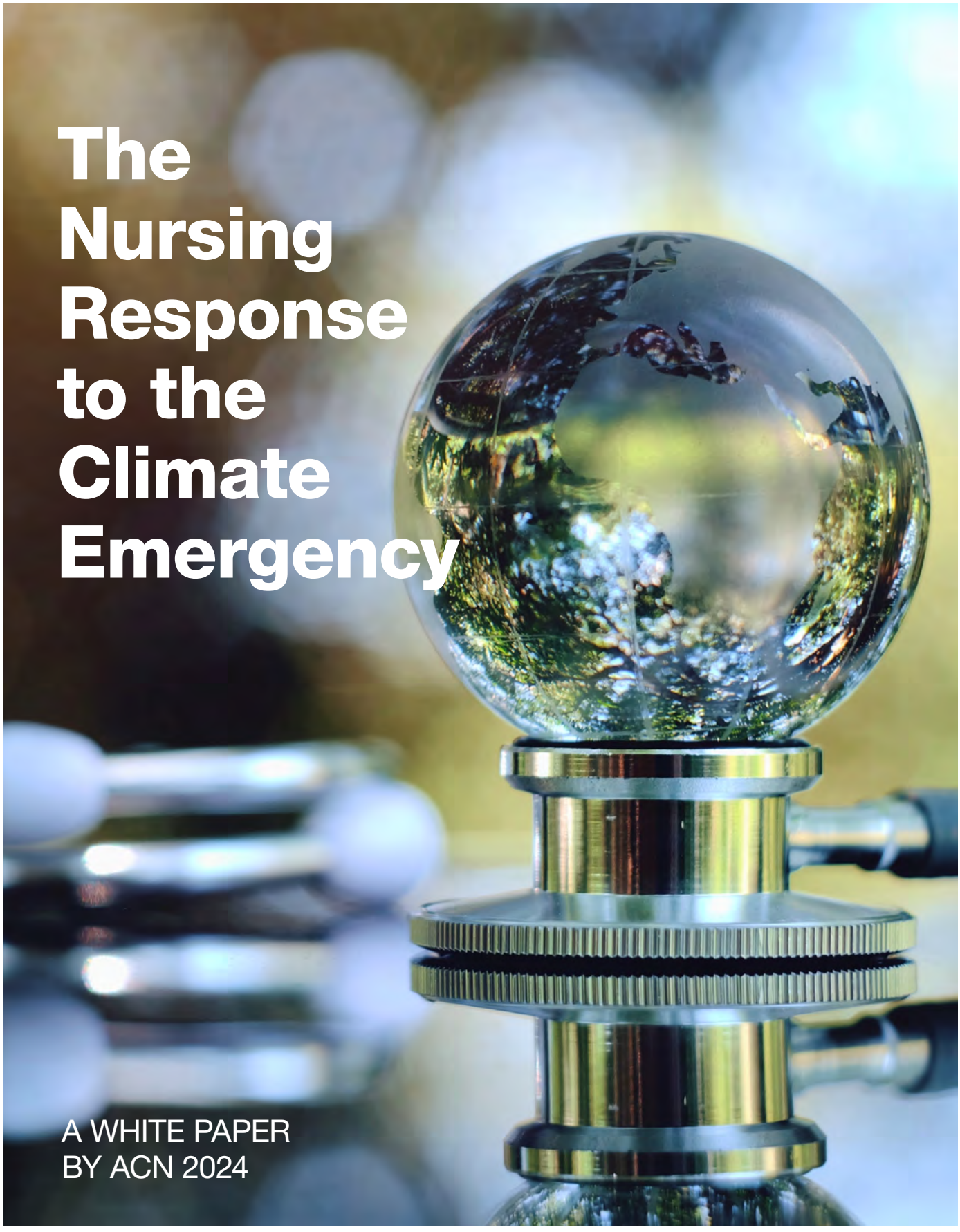
Australian College of Nursing



The Nursing Response to the Climate Emergency

A WHITE PAPER
BY ACN 2024

"Imagine the possibilities if the scope of nursing worldwide was expanded to include actions dealing with climate change"

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Abbreviations

ANMAC	Australian Nursing and Midwifery Accreditation Council
APN	Advance practice nurse
GHG	Greenhouse gas
GP	General practitioner
ICN	International Council of Nurses
IPCC	Intergovernmental Panel on Climate Change
MBS	Medicare Benefits Scheme
NCCTRC	National Critical Care and Trauma Response Centre
NMBA	Nursing and Midwifery Board of Australia
NP	Nurse practitioner
UK	United Kingdom
US	United States
WHO	World Health Organization

EXECUTIVE SUMMARY

Healthcare professionals are witnessing the health effects of climate firsthand. The increasing intensity, frequency, and occurrence of natural disasters combined with unprecedented climate affected health problems place significant pressure on our health system. Paradoxically, while health professionals care for those in the community suffering from the impacts of climate change, the health sector itself is a major contributor of harmful emissions.

Climate health and emissions reduction are complex issues that require nuanced, evidence-based solutions, and nurses are ideally placed to deliver these. As Australia's largest group of health professionals (Australian Institute of Health and Welfare 2024), nurses are uniquely positioned in the healthcare sector and our communities. This combination of expertise, community trust, and engagement must be utilised to build resilience and reduce emissions.

This White Paper presents a four-step climate stewardship approach for nurses responding to climate emergencies. First, we must rethink health service provision in the current climate emergency. Traditional, reactive health models focusing on continual disaster response will not meet the health system's climate-affected demands. We must develop a coordinated, national climate response that foregrounds nursing wisdom and expertise.

Second, nurses must be enabled to lead emissions reduction strategies within health care through quantifiable and sustainable targets in the urgent transition to low-emissions health care. This requires a national inquiry to measure the existing carbon footprint, allowing the industry to set measurable targets. A nurse with climate and sustainability expertise must be placed within healthcare settings and across all industry and government partners to develop and implement sustainable models of care and lead climate action efforts. Furthermore, we must identify where nurses can be deployed to utilise the healthcare workforce better and drive cross-sector collaboration. This includes considering transitioning to local nurse-led models of care that limit transport emissions. Effectively using the nursing workforce, which is equipped to deliver critical healthcare services, will assist in keeping people out of high emissions of care. Nurses must also be enabled to work to their full scope of practice and move to value-based, sustainable healthcare models to support healthcare consumers.

Third, climate stewardship needs to be developed in the nursing workforce through climate education and research. This requires a radical shift in the education of nurses in climate health, emissions reduction, and sustainability. Climate stewardship must be integrated throughout the nursing curriculum. Consolidating climate health and sustainability as a nursing specialty is required to build additional capacity. The profession must establish, define, and train climate nurse specialists through targeted post-graduate education. Nurses must quantify the success of their interventions through inter-professional and cross-sector nurse-led climate research.

Finally, to understand the environmental impact of clinical care, precise data collection, monitoring, and reporting of the health sector's carbon footprint are imperative. An immediate national inquiry is needed to evaluate Australia's healthcare industry's carbon footprint, data to guide emissions reduction targets, and enable continuous data collection for monitoring progress. Additionally, vulnerable communities lacking adequate medical services face increased demand during climate-related disasters, necessitating resilient systems and a minimum dataset for nursing workforce planning to optimise service provision.

We must deliver fiscal, equitable, quality services in a climate emergency while reducing healthcare emissions. More broadly, nursing calls on all industries to prioritise lowering emissions.

INTRODUCTION

Climate health in a climate emergency

Climate change is the statistically significant observable change in Earth's weather patterns, temperature, ocean levels, land surfaces, and ice sheets over a defined period (Australian Academy of Science 2022). Recent climate change, caused by the increased atmospheric concentration of greenhouse gases (GHGs), directly results from human activity. Since the industrial revolution of the late 1800s, there has been a rapid increase in the use of fossil fuels, which correlates with the rapid rise in global temperatures (IPCC 2021).

Methane and carbon dioxide are the primary gases released through fossil fuel consumption. These extra gases form a layer around the planet and act as heat traps that raise temperatures and disturb weather patterns. According to the Intergovernmental Panel on Climate Change (IPCC) the earth is now 1.1 degrees Celsius hotter than in the mid-1800s (IPCC 2022a). Furthermore, 2023 was the hottest year on record (IPCC 2024). The evidence for climate change is unequivocal – atmospheric and ocean temperatures have increased, polar caps have melted, and sea levels have risen (Australian Academy of Science 2022; IPCC 2022a; IPCC 2021).

Climate change is also causing unprecedented increases in the frequency, intensity, and occurrence of disasters. Current consequences of climate change include intense droughts, water scarcity, heatwaves, severe fires, rising sea levels, flooding, catastrophic storms, and declining biodiversity (Butler et al. 2022). In 2021, the Intergovernmental Panel on Climate Change (IPCC) described climate change as a 'code red for humanity' (United Nations 2021). Retrospectively managing the health impacts of climate change while reducing health care will significantly reduce the negative effects of climate change.

The healthcare industry in Australia accounts for 7% of the national carbon footprint (Malik et al. 2018). The footprint needs to be nationally quantified to define and measure reduction targets. The most significant contributor to the healthcare sector's carbon footprint is purchased products, which account for 71% of healthcare's carbon emissions. Other sources of emissions are the disposal of medical consumables, pharmaceutical devices and equipment, food, and agricultural products such as paper (Kiang and Behne 2021). Without any attempts to reduce emissions, the health industry's carbon footprint is expected to triple by 2050 (Kiang and Behne 2021).

The impact of climate change on health outcomes

Climate change is one of the most significant health crises facing nursing today (International Council of Nurses 2018). It has created irreversible human health and welfare symptomology (Butterfield et al. 2021). The predicted death rate from climate change is expected to reach 250,000 annually between 2030 and 2050 (WHO 2023). The demand for health service response will match with disasters occurring at unprecedented frequencies. The relationship between climate change and its impacts on health is illustrated below in Figure 1.

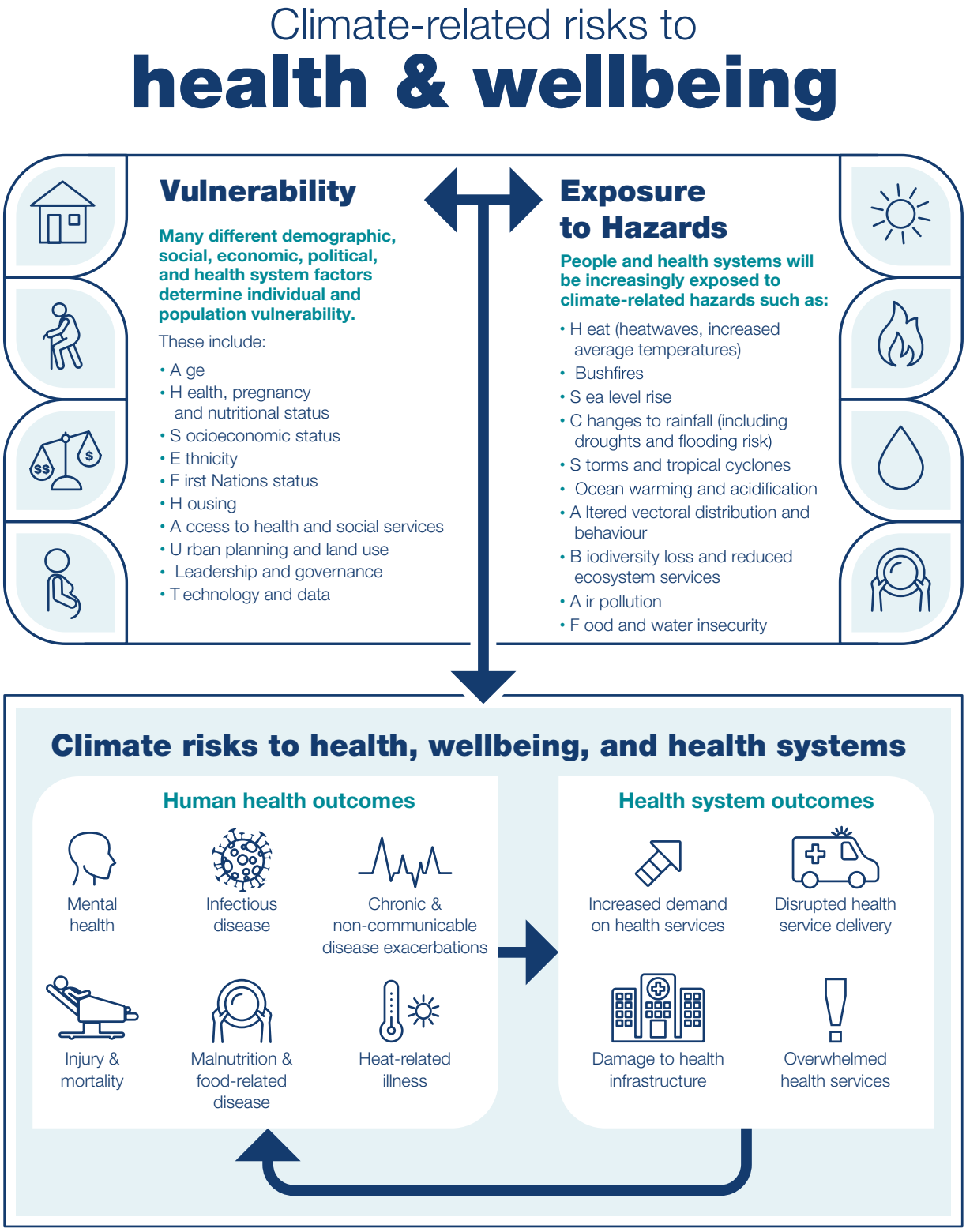

Figure 1. Source: Department of Health and Aged Care 2023:28

The 2019-20 Australian bushfires resulted in 450 deaths, including 33 directly from the fires and 417 from smoke exposure, over 1,300 asthma emergency department presentations and over 3,150 hospital admissions for cardiovascular and respiratory conditions during this time (Zhang et al. 2020).

The impact of the Canberra bushfires (2019-2020) on health services

Context: The Canberra bushfires of 2019-2020 were unprecedented in size and scale. Bushfire-related emissions from smoke caused more than 400 deaths and over 3,000 hospitalisations – resulting in an estimated $1.95 billion cost to the Australian healthcare system. Poor air quality also led to increased reports of eye irritations, coughing, and headaches for many Australians after the bushfires were extinguished.

Impact: Along with the influx in emergency admissions, the air filtration systems in Canberra Hospital could not deal with the unhealthy levels of smoke inside the buildings. Medical equipment, MRI, and CT machines failed from the smoke contamination. Birth suites and operating theatres were infiltrated with smoke, and staff working in clinical areas also suffered from smoke inhalation and heat.

Response: Air purifiers were installed in clinical areas, and comfort packs were provided to staff to lessen the effect of working in busy smoke-contaminated work environments. Health sites performed regular emission assessments, creating a level of preparedness in staff who could recognise when air quality was inferior.

Lessons: A paradigm shift in the healthcare system's approach to emissions reduction is crucial to mitigate the impact of climate change and emission reduction in the future. The only way to achieve this is through nurse-led strategic imagination, creativity, and interdisciplinary collaboration.

(Duckett et al. 2020)

Severe weather events notwithstanding, climate change has long-range and indirect impacts on health. Rising air temperature and atmospheric composition increase cancer and respiratory disease burden. Rainfall and temperature patterns alter insect prevalence and associated vector-borne diseases, such as the Japanese encephalitis virus, now found in the temperate climates of southern Victoria (Lima et al. 2024).

Poor health outcomes resulting from climate change intersect with socio-demographic issues such as age, gender, health status, socioeconomic status, social capital, public health infrastructure, mobility, and geopolitical conflict (Butterfield et al. 2021). Combined, these environmental and social determinants of health result in a higher disease burden (Crear-Perry et al. 2021). Human habitat destruction and mass migration as a result of climate change unequally impacts developing nations and vulnerable populations, such as young children, older people, women, and people in poverty.

The health effects of climate change include:

- Increased temperature extremes related to poor health outcomes.
- Disasters occurring at unprecedented frequencies with associated physical and mental trauma presentations.
- Increased morbidity, mortality, and demands on health services as the frequency of floods, storms, bushfires, and heatwaves increases.
- Increased burden of vector-borne infectious diseases associated with warmer and wetter climates.
- Poorer water quality and subsequent rise in water-borne infectious diseases.
- Increased air pollution.
- Arable land changes with reduced biodiversity, leading to food insecurity and nutritional deficiencies.
- Increased occupational health risks and heatstroke presentations for outdoor workers.
- Increased burden of psychological distress from severe weather events and climate change.
- Increased burden of aeroallergen and air pollution diseases related to warmer temperatures, longer pollen seasons, high emissions industries, and bushfires.
- Increased cardiorespiratory diseases.

(IPCC 2022c)

The Climate Health Paradox

Australia's health system confronts the dual challenge of addressing climate change's poor health outcomes and reducing its substantial contributions to the national carbon footprint (Malik et al. 2021). In 2018, Australia's health system contributed approximately 7% of the nation's carbon dioxide (CO2) emissions, with public hospitals being the highest emitters (Malik et al. 2018).

The healthcare sector is a significant producer of emissions globally and, paradoxically, cares for those most impacted by climate change. The healthcare system will also need to manage the population's health issues, directly and indirectly, arising from the impacts of climate change. This places the healthcare system in an unenviable position to develop interventions to reduce their carbon footprint, address the population's health needs, and respond to health emergencies while developing preventive measures to empower communities to adapt and respond to climate change.

Historical and current structural racism has ensured that climate change has unequally impacted First Nations peoples in Australia and worldwide (HEAL network & CRE-STRIDE 2021). The Torres Strait Islander community is already affected by seawater inundation and an increase in vector-borne diseases (Hall et al. 2021). Other at-risk populations, including older adults and newborns, will be significantly impacted by climate change due to different physiological responses to heat and susceptibility to climate-related infectious diseases (IPCC 2022b). As climate-driven disasters become more powerful and frequent, healthcare systems and our communities face a vicious cycle that exacerbates the growth of social and economic inequality and social disadvantage. Left unaddressed, these communities will become increasingly vulnerable to climate-related events.

Complex problem = complex solution: Nursing climate stewardship in all industries is the answer

To limit the catastrophic effects of climate change, there needs to be an urgent reduction in GHG emissions from the healthcare industry. Planetary health is intricately linked to human health, quality of life, and physical, chemical, biological, and social issues. Healthcare professionals must be at the forefront of reducing emissions and advocating for community-driven policy change (Nagai et al. 2021). As the largest, most geographically diverse healthcare profession, nurses are best placed to advocate for urgent policy development that delivers sustainable energy management in all health facilities (Nicholas and Breakey 2017). Nurses must be leaders in the health sector and work with diverse professions and industries to call for an urgent response to climate crises and further emissions reduction.

There is no 'one size fits all' response to the impacts of climate change on health care. Fundamental principles of optimal health care — prevention, early intervention, and low-value/non-evidence-based care reduction — are highly congruent with the climate change agenda. This nursing knowledge is transferrable to other industries and professions, including emergency services, education, heavy industry, transport, aviation, manufacturing, agriculture, government departments, and the corporate sector. These industries can look to the nursing profession for complex solutions to this complex problem. Nursing wisdom, founded on prevention, resilience, and response, can be embedded, and shared outside the healthcare professions. All industries need to meet national and international targets.

Upstream action on climate change — particularly mitigation in Australia's context — will prevent burdens on the healthcare system and support its resilience and ability to deliver services in the climate emergency. Developing appropriate preventive strategies for climate change requires the expertise and knowledge of Australia's diverse nursing profession. Nurses should be critical in decision-making and immediate planning around emissions reduction and climate stewardship within a generative approach. Therefore, ACN proposes a four-pillar approach to nurse-led climate stewardship (see Figure 2).

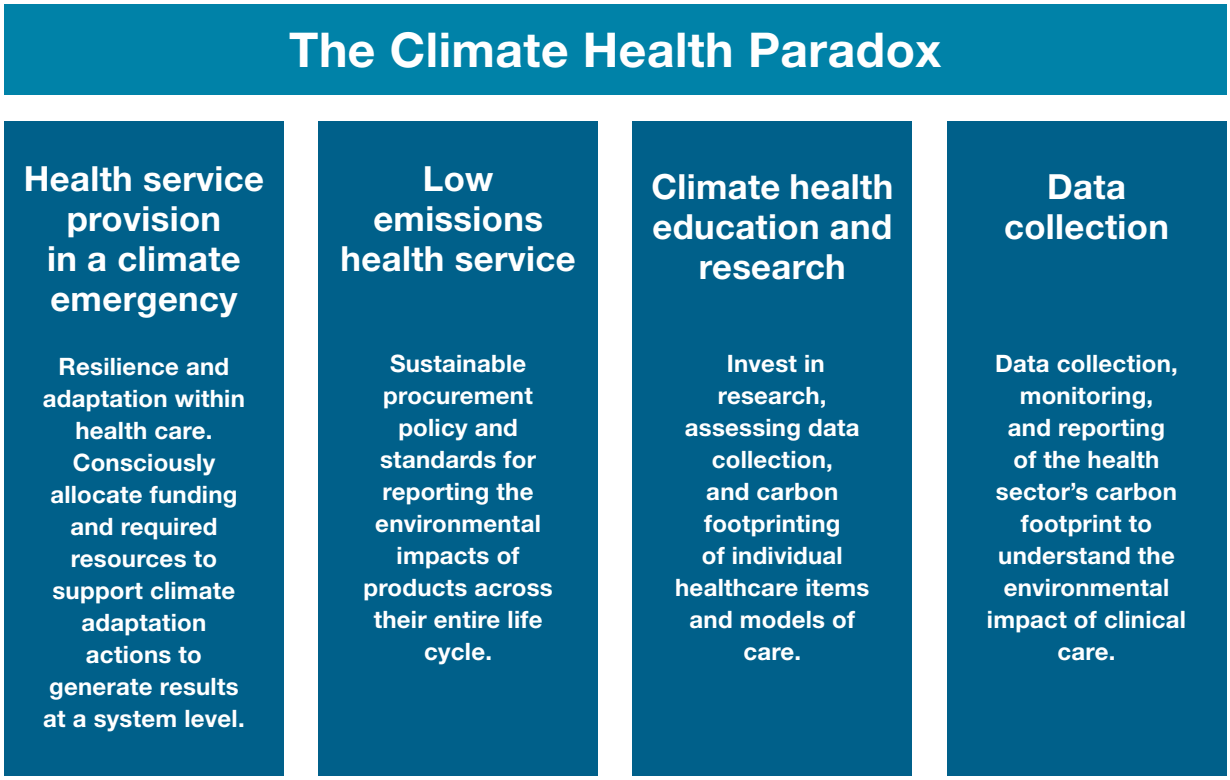

Figure 2. Four pillars for nurse-led climate stewardship.

RETHINKING HEALTH SERVICE PROVISION IN A CLIMATE EMERGENCY

A move beyond disaster response: a national climate disaster response and prevention framework

Currently, the healthcare system is permanently in disaster response mode. Escalating disasters combined with the climate effects on chronic conditions and vulnerable people will only compound the strain on the healthcare system. The Australian Royal Commission into National Natural Disaster Arrangements cautions that the frequency and intensity of extreme weather events will only be compounded with further global warming (Binskin et al. 2020). Swift action to build resilience into our healthcare systems is required to meet this projected demand, allowing for a shift from continual disaster response to disaster preparation, prevention, and generative plans for service delivery in a climate emergency.

A generative approach to climate response is where climate stewardship is ingrained in an organisation. From the boardroom to the casual contractors, everyone thinks of climate change and their work as inseparable (Unsworth et al. 2021). The intention is to move beyond the typical governmental and health system emergency response. ACN congratulates the Australian Government on establishing the National Health, Sustainability, and Climate Unit (Department of Health and Aged Care 2023). However, it would urge the government to ensure nurses are proportionately represented within this Unit. Nursing can play an integral role in advocating for and implementing generative strategies utilising knowledge gained from the community and cross-sector collaboration. Currently, health, emergency, and disaster response services are fragmented. This is due to poor coordination between local, state, and federal agencies. A new way of thinking about disaster service delivery in a climate emergency is required. Moving from disaster response to building climate resilience in our healthcare systems and communities will include climate, disaster, public health, primary, acute, and critical nursing expertise in national, state, and local plans.

In March 2022, two consecutive climate-escalated flood events occurred in Lismore, northern New South Wales. This resulted in an unprecedented demand for health and emergency services. This is an event with a fragmented disaster response that Australia must rapidly learn from. A positive outcome would result in a national coordination of services for both community and fiscal reasons.

A case study – Lismore floods

'A Lismore nursing home was left to fend for itself for more than seven hours after a record breaking flood inundated the premises, forcing night staff to move more than 30 residents out of the floodwater without help from emergency services.

During the crisis, NSW Police received a record number of triple zero calls, prompting police to activate an "extreme event" recorded message to people whose calls could not be immediately answered by police or fire operators. The SES helpline was also overwhelmed by calls for help, and the service used the Rural Fire Service's Bush Fire Information Line call centre to help answer the SES calls.

Under the Lismore local flood plan, NSW Ambulance is responsible for evacuating elderly and infirm residents, and health services assist with warning and evacuating aged care facilities. NSW Health said it was not responsible for this. The federal health department and Ambulance NSW have both declined to comment.'

(Naylor and Gilmore 2022)

ACN welcomes the publication of the National Health and Climate Strategy (Department of Health and Aged Care 2023), which includes adaptation and resilience planning for increasing disasters. However, through the Health, Sustainability, and Climate Unit, a national cross-sector climate response and prevention framework must be urgently developed to be deployed in situations like those in Lismore. For this approach to be successful, coordination between the Commonwealth, states, territories, local governments, and defence and humanitarian and disaster non-government organisations must be coordinated. Nursing knowledge will be integral in this cross-sector implementation, and nurses' practical problem-solving skills must be utilised at the highest level.

The National Critical Care and Trauma Response Centre (NCCTRC) in Darwin exemplifies this model. From the lessons of the Bali Bombings in 2002, the Australian Government established the NCCTRC to respond to offshore events that require a swift, coordinated response and to draw upon existing fragmented resources (NCCTRC 2022). Nurses were central in developing this body that coordinates and builds workforce capacity. For this model to respond effectively to the climate crisis, a national body is required to administer it.

Identifying and maximising the geographically diverse nursing workforce in a climate emergency

Utilising the geographically diverse nursing workforce to its full potential and scope of practice is vital in delivering health services in a climate emergency. Nursing is the largest single health profession. In 2023 there were 473,672 registered nurses and midwives in Australia (Department of Health and Aged Care 2024). In 2022, nurses and midwives comprised 54% of the healthcare workforce (AIHW 2024a). As the lead clinician in many episodes of care, nurses are most likely to be the first health professionals seen by people in remote communities for specialist and primary care needs (CRANAPlus 2020).

Many of the most vulnerable communities are currently not fully serviced by medical officers (ACN 2018; CRANAPlus 2020). Climate and disasters increase demand for these services, requiring resilient systems to meet demand. A minimum dataset for the nursing workforce is needed to facilitate planning to optimise service provision in a climate emergency. Nursing workforce planning is multifactorial. The lack of a national minimum dataset prevents informed decision-making by workforce planners and strategic public health response in a climate emergency. A national minimum data set will maximise and mobilise a ready nursing workforce known anecdotally to be geographically diverse to continue to provide services to those most vulnerable in the escalating climate emergency.

A case study – Victorian thunderstorms

In 2016, a high pollen count combined with an unusually severe thunderstorm cell contributed to a high level of respiratory distress in Victoria.

This resulted in a 73% increase in demand for health services over six hours, with a 58% (9,090 presentations) increase in emergency department presentations. This amounted to a 672% increase in respiratory-related presentations.

There was a fivefold increase in telehealth demand.

A total of nine people died of the climate event.

Ambulance resources were stretched, resulting in delays in dispatch and hospital wait times.

The event was directly linked to poor awareness and planning for predictable climate events. Better planning could have anticipated and provided surge capacity.

Optimising advanced climate nursing practice to meet escalating climate demands

Increased climate pressures on health service delivery will threaten medical-led health care's economic viability and quality. A traditional medical-led model of care is not a sustainable or efficient use of health resources. There is a solid historical, legal, and regulatory assumption that healthcare services need to be led by medical practitioners. These traditions, laws, and regulations are incongruent with the provision of health care in the climate-affected Anthropocene of the 21st Century. Enabling nurses to work to their full scope of practice to meet the escalating demands of climate on the health system will allow for a shift away from historic, medically dominated models of service delivery (ACN 2024). Nurses are essential to the wellbeing of their communities – the pulse of their communities. However, nurses are currently prevented from working to their full scope of practice due to local, state, territory, or Commonwealth restrictions (Australian Nursing and Midwifery Federation 2023). Respectful interdisciplinary care optimising all practitioners' education and practice potential is urgently needed to address the climate crisis and its impact on health.

Underutilisation of primary healthcare nurses

Primary healthcare nurses are not always employed to their full potential in Australia. The community and primary healthcare sector are significant components of Australia's healthcare system, providing direct healthcare services to the community across its lifespan. This includes health promotion, the prevention, diagnosis, and treatment of acute and chronic health conditions, and support in managing long-term health care, particularly for individuals with chronic health conditions such as diabetes, chronic obstructive pulmonary disease, cardiovascular disease, and mental illness (ACN 2021a).

A survey of general practice nurses suggests that over one in three nurses are not maximising their knowledge and skills (Australian Practice Nurse Association 2018). Of those surveyed, 30% identified that the practice manager or GP was the primary barrier to not functioning to their full scope. Furthermore, nurse-coordinated complex care management was recorded against the medical officer for funding purposes due to the exclusion of nurses from the Medical Benefits Scheme.

This new paradigm requires optimising advanced care nurses and nurse practitioners. Advanced practice nursing harnesses nurses' experience, education, and knowledge to allow them to practice at the total capacity of the registered nurse practice scope (ACN 2019). Advanced practice nursing is neither a title nor a role. However, it is a level of clinical practice that integrates nursing knowledge and skills from the clinical, healthcare systems, education, and research domains of nursing (ACN 2019). This allows the nurse to practice as a nursing leader and fulfill many clinical roles effectively and efficiently. It is vital to support nurses in working to their full scope of practice as autonomous practitioners, encompassing a broad and diverse set of roles and responsibilities within various clinical settings in the community and other healthcare settings.

Stretching the climate budget – A move to value-based health care

The cost of health provision in a climate emergency will escalate in parallel to growing demands on the system. Health provision, as a proportion of the gross domestic product, is the fastest rising Commonwealth budgetary cost, with the current delivery models paradoxically exacerbating the issue (WHO 2019; ACN 2021c). Total health spending has increased by 50% in the last ten years, exceeding the population growth rate (AIHW 2024a). The triple bottom line, the balance of financial, social, and environmental objectives, must be at the forefront of managing service provision in a climate emergency (Duane et al. 2014; Braithwaite et al. 2023).

Rapid response to climate change requires nursing involvement to transform the fiscal management of Australia's health system. The sector has traditionally been reactive and focused on managing the impact of the climate crisis rather than delivering high-value, net-zero emissions, and sustainable healthcare. In addition, the current Australian health industry is a piecemeal mix of funding sources delivered through private and public services. Some health services are nationally funded, while others are s tate or territory funded (AIHW 2024b)

Policy development and service delivery vary significantly across the country. This results in an extensive, labour-intensive, expensive, and complex system that duplicates services.

A move to value-based funding models is essential. Value-based healthcare is defined as 'health outcomes that matter to patients relative to the resources or costs required, over a full cycle of care' (ACN 2020a). Climate change will magnify the cost of health service provision. Current funding and practice models limit the potential for flexible health care delivery and person-centred care. The decline in service provision, climate effects on health, and exacerbation of poor health in conjunction with the escalation of health costs could be reduced with a move to value-based funding.

Value-based healthcare reforms are expected to reduce carbon emissions by reducing unnecessary investigations and treatments while focusing on patient wellbeing and health (MacNeill et al. 2021; Barratt et al. 2022). A public health approach encompassing health promotion, education, and initiatives that aim to reduce the incidence and severity of disease will also support the shift to value-based health care (MacNeill et al. 2021). However, more significant funding is required for primary care services, counselling, immunisation, screening programs, and chronic disease management.

A focus on preventive public health and value-based health care is required to ensure that value is obtained from a climate-affected system. The recent COVID-19 pandemic has demonstrated that health systems can be quickly mobilised when there is a need to protect public health. Strong governance and leadership are required from all levels of government and business to achieve these goals.

Nurse-led cross-sector collaboration and leadership

As the most trusted profession, nurses can amplify vulnerable voices in community consultation and engagement (Climate and Health Alliance 2021; Butterfield et al. 2021). The intention is to move beyond the typical government and health system emergency response. This requires deeply involving nurses and nurse leaders to play an integral role in advocating for and implementing responsive strategies that target emissions reduction and climate resilience across government, industry, and health services. For instance, proportionate nursing representation is vital to the success of the National Health, Sustainability and Climate Unit.

Educating and empowering nurses to develop, research, and implement innovative approaches and lead emissions reduction activities will benefit Australia's national climate preparedness. This fosters a partnership approach between healthcare systems and the communities nurses work in to plan for and mitigate the impacts of emissions on our people and healthcare system.

Nurses with climate and sustainability expertise should be appointed at all healthcare levels, including leadership and strategy roles, to champion climate health risk management and emissions reductions. A nationally coordinated cross-sector approach led by nurses is needed to ensure appropriate responses to climate change are implemented across all jurisdictions. This systems approach involves nurses in all decision-making within and across all relevant policy portfolios. Nurses must collaborate with other health agencies across interdisciplinary and systems boundaries to amplify and facilitate emissions reduction and system resilience efforts in all industries and professions.

LOW EMISSIONS HEALTH SERVICES

National inquiry into lowering healthcare emissions

Globally, the health sector is responsible for 4.4% of GHG emissions, which is close to double the emissions of the aviation industry (2.5%) (Budd 2022). This creates a paradox – the healthcare system cares for those most impacted by climate change while significantly contributing to climate change. A US study found that the effects of healthcare emissions may cause 44,000 to 98,000 indirect deaths nationally every year (Eckelman and Sherman 2016). The contribution of emissions to health varies by country, in line with the healthcare expenditure.

The Australian health system is rapidly innovating and reforming, building on lessons learned during the COVID-19 pandemic response. Similarly, a rapid and innovative response is also needed to shift to low emissions healthcare service delivery as a matter of urgency to limit the impact of climate on the community and health system. This can be achieved by adopting environmental, social, and governance principles used extensively to guide business development in the commercial spheres (Butler et al. 2022). For this to be attainable, the healthcare sector must quantify and address the impact of emissions and climate change on all Australians.

An urgent national inquiry into the carbon footprint of the Australian healthcare industry is required to identify the baseline and guide emissions reduction targets. This will quantify Australian healthcare industry emissions and act as a data source to guide reductions by identifying a tangible target and metrics to measure emissions reduction strategies.

Nurses to drive sustainability at every level

Every day nurses treat patients affected by climate change. Yet despite the nursing profession's pledge to do no harm, the healthcare industry itself is a significant contributor to global warming and environmental change. As healthcare leaders, nurses are responsible for serving the community as advocates for change in public policy that will protect humanity (Turale and Kunaviktikul 2019). Nurses have an ethical imperative to lead the development of equitable climate change and transition to zero emissions for their patients, peers, community, and policymakers (ACN 2020b). Nurses control high emissions episodes of care and can lead by example to decarbonise health care while reaping the benefits of improved health outcomes. This helps ease the growing pressure on the health system with an ageing population and subsequent rise in chronic health conditions. Nurse leaders are required to deliver safe, cost-effective, and responsive clinical care while meeting productivity targets and acknowledging the environmental and social expectations of the community (Eckelman et al. 2020). Nurses must adopt social sustainability concepts, which require the profession to uphold social justice and ethical decision-making in distributing limited resources (Dunphy 2013).

Evidence shows that solid nursing representation and leadership in emissions reduction and climate resilience discussions at all levels provide mitigation interventions across all industries and governments (WHO 2023; Butterfield et al. 2021). Nurses with climate and sustainability expertise should be embedded in every local health service and adjacent disaster, health, humanitarian, population, and community organisations. These nursing specialists would augment and support nursing and healthcare leaders in managing this complex issue. Nurses must lead and empower all health professionals by embedding environmentally sustainable healthcare practices into every aspect of the health spectrum from an economic, social, health, and environmental perspective (Schwerdtle et al. 2020). This is known as sustainability practice and climate stewardship. Nurses in these roles can learn from the corporate world, where sustainability practices are informed through consumer engagement based on environmental and social governance principles. Consumer-driven sustainability engages with relevant consumer stakeholders in decision-making to capture social aspects before implementing change (Hussain et al. 2019).

Guided by the expertise of these specialist nurses, all nurses and healthcare professionals must drive change within their area of influence. The deadline to reduce emissions and ensure environmental sustainability is now. Environmental preservation and action on climate change are essential to providing high-quality health care (Kiang and Behne 2021).

Nurse-led emissions reduction strategies with targets and outcomes

Nurses must lead sustainable practices in the healthcare sector to provide a high-quality, clean, and safe physical environment as part of a broader, long-term sustainable ecosystem. Currently, the focus is on retrospectively assessing vulnerabilities and performing adaptation assessments, with most systems seeking to switch to renewable energy sources and optimising waste and recycling management (MacNeill et al. 2021; National Health Service England 2020). Healthcare organisations must strengthen their systems by developing health-inclusive and health-promoting climate targets and policies (Desmond 2018).

The scope of this White Paper is to propose a new vision for nurses to lead, research, and validate sustainable practices. Healthcare delivery generates considerable waste, energy, water consumption, agriculture and food use, chemicals, and transportation emissions (Hoban et al. 2021).

Evidence-based nurse-led emissions reductions strategies

- Reduction of travel, transportation, and energy consumption in health care.
- Use of recyclable and reusable alternatives where plausible.
- Sustainability is embedded in procurement and investment in all new products or tenders.
- New hospital design projects include renewable energy, green computing, and environmentally considerate architecture (Desmond 2018).
- Operating theatres that shift away from central heat-trapping anaesthetic gases maximise instrument reuse or single-use device reprocessing, reducing energy use in the operating room (Thiel et al. 2018).
- Use biodegradable materials wherever possible.
- The 'Healthy People, Healthy Planet' coalition of healthcare facilities collaborates with other healthcare organisations to reduce greenhouse gas emissions (Bennett 2021).
- Food management through order-on-demand services in healthcare facilities.
- Robust food waste management and monitoring schemes.

Nurses directly control high-waste episodes of care and should lead sustainable practices through 'environmental stewardship' (Schenk 2019). ACN has published an Emissions Reduction Charter,

Position Statement and Guiding Principles should be implemented at all sector levels (ACN 2020b; ACN 2021b; ACN 2021c). Nurses should partner with the government, industry, and health services to promote and prioritise the importance of reducing emissions in the healthcare sector. Nurses must hold these bodies accountable by defining emissions reduction targets within health care and, most importantly, measuring their success.

A national approach is required to overcome the Australian healthcare system's fragmented approach. Primary care practices operate as small businesses, making it difficult to track the overall impact of sustainability measures. Subsequently, organisations must individually assess their vulnerabilities and identify strategies to support greener health care. There is also a need to improve healthcare workforce climate literacy and the impacts of climate on health (Shaw et al. 2021). This is in contrast with the United Kingdom's current model.

A case study – NHS net-zero plan

In 2020, NHS England committed to net-zero carbon emissions by 2045 (National Health Service England 2020). Since then, every NHS Trust has been able to implement an ambitious climate change mitigation and adaptation plan and even legislate the healthcare professionals' responsibilities in addressing climate change impacts. Fundamental changes were implemented using inhalation anaesthetics, metered-dose inhalers, recycling non-clinical waste, and reviewing food waste. There is also significant investment into renewable energy, efficiency and use of lighting, transition to electric vehicles, including ambulances, transport of blood specimens, patient transport, and wielding substantial negotiating power to force suppliers to provide products supportive of emission cuts.

(National Health Service England 2020)

While many of the NHS initiatives in the UK can be adapted to Australian healthcare settings, a coordinated national emissions reduction framework underpinning the conduct of health service providers, such as the National Health and Climate Strategy, will help promote sustainability and improve health outcomes. This would require the definition of nationally accepted and measurable targets. It would need to be transparent and auditable to encourage the sector to be accountable for meeting its emissions reduction targets. The National Health, Sustainability, and Climate Unit must bolster its focus on strategies that reduce health sector emissions and foreground nursing wisdom as it administers the framework.

Nurse-led models of care to reduce emissions

Low-emission models of care are required to address the climate emergency facing health services. There is a substantial carbon footprint related to travel to healthcare appointments and patient movements to centralised specialist care (Forner et al. 2021). The health industry has become increasingly sophisticated in data collection on carbon emissions; therefore, an increase in transportation-related carbon emissions has become an important issue (Duane et al. 2014; Braithwaite et al. 2023).

Localised nurse-led models of care to reduce patient transport emissions are required to transition to a sustainable health model. Examples include outpatient services in non-serviced areas and specialist liaison teams from large organisations to sub-specialties. Using nurses to perform tests locally, reducing unnecessary patient investigations (such as pre-operative testing when not indicated), using telehealth for primary healthcare, and reducing clinic visits and patient travel are proven strategies the health care industry can implement to reduce transport emissions (Wang et al. 2021).

Moving to the home hospital and maximising primary health and community nursing roles are lower emissions models (Malik et al. 2018). A localised nursing model of care prevents unnecessary high-emissions episodes (such as transport costs and acute hospitalisations) by focusing on prevention and early intervention. This nursing model of care provides high-quality, community-based health services, meaning people are hospitalised as a last resort, thus reducing emissions episodes of care.

Monitoring via 'virtual wards' has been implemented during the pandemic as an effective way to reduce the burden on the healthcare system. However, this also effectively reduces emissions by preventing high-emissions episodes of care. The implementation of nurse-led pre- and post-hospitalisation telehealth can be an effective way of reducing emissions (Wang et al. 2021). Outreach clinics and bolstering regional, rural, and home-based nurse-led rehabilitation care may reduce GHG emissions (Forner et al. 2021).

Engaging aeromedical services in emissions reduction through tasking, fleet modernisation, and sustainable aviation fuel use is vital. A centralised health service may reduce health service carbon and service costs. However, patients still must travel a distance for health care, contributing indirectly to emissions (Duane et al. 2014; Braithwaite et al. 2023). Australia experiences the tyranny of distance, and the system works hard to ensure equitable access. Patients must always be transported for specialist care, so collaborating with most nurse-led aeromedical services is important (Brideson 2017).

Schemes encouraging health staff to commute more sustainably via public transport, car sharing, walking, and cycling would help reduce transport emissions. This benefits a public health strategy that fosters staff wellbeing by reducing obesity and improving cardiovascular fitness. Installing electric vehicle charging points in health facilities is also encouraged.

Nurse-led and mediated telehealth and digital health models reduce the environmental impact of face-to-face consultations. Telehealth was introduced in the late 1970s but saw a significant uptake due to the COVID-19 pandemic. This has had a positive environmental impact through reduced car journeys while maintaining optimal healthcare access (Filfilan et al. 2021). Some services reduced their emissions by 99% through telehealth and less patient travel (Filfilan et al. 2021).

CLIMATE HEALTH EDUCATION AND RESEARCH

Education for nurses in planetary health, emissions reduction, and sustainability

The WHO has identified climate health as a critical priority in healthcare education (WHO 2021). Integrating climate health, sustainability, and emissions reduction within nursing education and research will build the capacity for the nursing workforce to respond to evolving workforce trends and produce graduates who are work-ready for the future. The nursing profession is underpinned by maintaining health and has currency in promoting the health of individuals and broader society (Goodman and Richardson 2010).

Nursing education to support new climate and sustainability roles is limited and does not equip the workforce with the skills and knowledge required to fully capitalise on the nursing profession's capacity to lead change. The profession needs to rapidly evolve to address the climate emergency with the establishment of roles within nursing that focus on sustainability and climate health (Cook et al. 2019). Climate and planetary health nursing is quickly becoming a sub-specialty within nursing leadership roles, with several states appointing chief sustainability nurse positions. The number and scope of these roles are projected to grow to address the healthcare industry's response to this emerging challenge (Nicholas and Breakey 2017).

Evidence suggests that targeted education within curricula and healthcare settings for the nursing workforce improves the ability of the profession to reduce emissions, manage waste, and respond to the unfolding climate emergency (Ward et al. 2022). Education will position the largest workforce in health care to actively respond to the impacts of climate change and mitigate further climate impacts. The profession must begin with equipping their students, graduates, and future workforce with the curriculum's climate health knowledge and stewardship.

The WHO has recently released a welcome resource to enhance nurses' effectiveness as climate communicators. As the WHO Toolkit for Health Professionals states:

"Communicating the health risks of climate change and the health benefits of climate solutions is both necessary and helpful. Health professionals are well-placed to play a unique role in helping their communities to understand climate change, protect themselves, and realise the health benefits of climate solutions."

(WHO 2024)

Climate stewardship and planetary health in the undergraduate nursing curriculum

The International Council of Nurses (ICN) position statement on 'Nurses, climate change and health' calls for nurses to take immediate action to build climate-resilient healthcare systems (ICN 2018). This demonstrates the importance of educating all nurses in our future and current workforce, regardless of their specialty. The Australian Nursing and Midwifery Accreditation Council (ANMAC) is the national accrediting body of nursing curricula. ANMAC mandates that nursing education providers must deliver a curriculum that is responsive to emerging trends (Standard 3.4) (NMBA 2019). Planetary health, sustainability, and emissions reduction are undoubtedly emerging trends within the healthcare sector. Despite the requirements of ANMAC, there is currently limited evidence that climate health, emissions reduction, and sustainability have been integrated widely within nursing curricula in Australia. Anecdotal evidence suggests that some nursing schools have implemented some climate health content, but this is far from a requirement.

A rapid transformation of nursing education to build the capacity required to deliver services in a climate emergency while reducing healthcare emissions requires nurses to be educated. Nursing graduates should possess the knowledge, skills, and ability to respond to climate emergencies, reduce emissions, and build resilience within the healthcare system and the communities in which they live. This can be achieved by educating nurses in their undergraduate degrees about how climate change can impact direct patient care, waste management, resource utilisation, client and community education, and health policy development (Boylan et al. 2019; Ward et al. 2022). This would ensure that all graduates possess the foundational knowledge for practicing in an evolving social and healthcare environment that addresses the impact of climate change and mitigates further climate impacts (Aronsson et al. 2020). Incorporating climate health into undergraduate nursing curricula would mirror the medical professionals who have already done so (Madden et al. 2022).

Climate nursing specialists – Professional development for the existing workforce

Nurses care for those most severely impacted by climate change while working within a system that is paradoxically one of the largest emitters. However, most registered nurses have had neither formal nor informal education opportunities to limit the impact of climate change within the healthcare system. This includes units caring for people under extreme climate circumstances or assisting people and communities in building resilience (Cook et al. 2019).

Nurses within all contexts require education to assist them in identifying how to reduce emissions and practice sustainably in a healthcare environment impacted by climate change (Cook et al. 2019). However, with the emergence of specialist sustainability and climate roles in nursing and, more broadly, health care, there are limited formal post-graduate programs available specifically for nurse clinicians. This means nurses cannot step into leadership roles and further develop the profession's capacity to adapt and respond to the impacts of climate change and the need for sustainable practice.

Providing planetary health education to enable nurses to drive innovation in addressing climate emergencies positively impacts health care (Cook et al. 2019). When nurses can engage in professional development opportunities, they are uniquely positioned to lead sustainable changes within the healthcare industry and build resilience in the communities they serve (Butterfield et al. 2021). Post-graduate education of climate nurse specialists and prioritising and maximising advanced climate practice are fundamental to foregrounding and expanding nurse knowledge.

Nurse-led climate research

Interdisciplinary clinician-led research is required to ensure that the most up-to-date evidence can be embedded within the practice to support climate stewardship. Implementation research is critical to ensure that findings guide various practice contexts in Australia and identify barriers and enablers to ensure sustainable, resilient practice within the healthcare industry (Boyer et al. 2020). Nurses are utilising scientific research to ensure sustainable practice within the diverse nursing contexts of practice positions. The interdisciplinary clinical healthcare workforce must continue to use research to inform sustainable approaches to care that address the impact of climate change on the healthcare system and communities. (Leffers and Butterfield 2018).

Both the scope and the magnitude of climate change-related health risks are daunting. Health adaptation efforts aim to reduce the health risks associated with climate change. They build on essential public health services and serve to strengthen core health system functions to offset these risks potentially. Across the health sector, however, implementation and uptake of these adaptation strategies have been uneven, constrained by limited resources and organisational capacity, inadequate assessments concerning the health risks, and imprecise estimates about the effectiveness of current or future climate-related interventions (Boyer et al. 2020). Further research is required to support the implementation of evidence-based strategies into practice.

Australia has limited opportunities for nurses to engage in clinician-led, funded climate health, emissions reduction, or sustainability research (National Health and Medical Research Council 2022). Dedicated grant schemes for interdisciplinary, clinician-led research into sustainably reducing healthcare waste and emissions, responding to health impacts, and building resilience within healthcare systems have been supported worldwide (National Institute for Health and Care Research 2022). This ensures that the healthcare industry and the Australian community can prepare for and respond to the impacts of climate change while mitigating the risk.

Nurses must be supported in acquiring and developing the critical sustainability and planetary health-related competencies required to transition toward more sustainable healthcare systems. This starts with the foundation of education and nurse-led research in climate health (Butterfield et al. 2021; Aronsson et al. 2020). Investment in nurse-led research on climate health, planetary health, emissions reduction, and sustainability will ensure the nursing profession's capacity to step into leadership roles and further develop the critical ability to address sustainability in a healthcare system directly impacted by climate.

A case study – the Nurses Climate Challenge

The Nurses Climate Challenge in the US aims to educate 50,000 nurses, with 42,000 nurses already undertaking climate health, emissions reduction, and sustainability education within their workplaces (Nurses Climate Challenge 2022). Furthermore, the US Nurses Climate Challenge supports Schools of Nursing in higher education facilities to embed climate health within their curriculum. To date, 55 Schools of Nursing in the US have pledged a commitment to prepare nurses to care for patients impacted by climate change and to understand how to mitigate further climate impacts.

(Nurses Climate Challenge 2022)

CONCLUSION

The evidence is undeniable – climate change is humankind's most significant modern health crisis. The healthcare sector is a vital carbon emitter while paradoxically caring for those most affected by climate change.

Nurses are equipped to take the lead on emissions reduction within and beyond the profession. Nurses have an essential role to play, both professionally and personally, in reducing emissions and mitigating climate-related health effects. Climate health and emissions reduction are complex issues that require a complex solution.

A complete rethink and overhaul of service provision in a climate emergency is required. We must forget traditional models of care that will not meet surging climate-related healthcare demands and develop a nationwide approach that foregrounds nursing wisdom and coordinates a national climate response. This will be achieved by ensuring the proportional representation of nurses in the National Health, Sustainability, and Climate Unit and that nurses are instrumental in leading the implementation of the National Climate Health Strategy.

"If working apart, we are a force powerful enough to destabilise our planet; indeed, working together, we are powerful enough to save it. In my lifetime, I have witnessed a terrible decline. In your lifetimes, you could and should witness a wonderful recovery."

(Attenborough 2021, 06:35)

Nurses must be allowed to work to their full scope of practice and lead cross-sector collaboration to respond to surging health demands experienced in a climate emergency. This requires a minimum nursing dataset to drive efficient, evidence-based surge workforce planning. Nurses must lead an urgent transition to low-emissions health care as a significant contributor to GHG emissions. This will require a national inquiry to identify the current carbon footprint of health care. Only then can we set tangible and measurable targets. The new and evolving role of nurses with planetary health, climate, and sustainability expertise must lead this. These expert practitioners must be embedded at every level within health care and across all industries and governments. A shift to low-emissions healthcare services will mean a transition to localised, nurse-led models of care that limit transport-related emissions. The system must amplify the wisdom of advanced practice nurses and experts in preventive, chronic, and primary healthcare models.

Climate stewardship must be developed in the nursing workforce through climate education and research. Nursing education will require a radical reform that places planetary health, climate, emissions reduction, and sustainability at the core of undergraduate nursing curricula. Furthermore, the current workforce will require climate stewardship capacity-building. The nursing profession is at a critical juncture, and it must establish, define, and train planetary health, climate, and sustainability specialists through targeted post-graduate education. This will complement nurse-led inter-professional and cross-sector collaborative research, which can extensively evaluate climate interventions inside and outside the healthcare sector to contribute to the scientific climate discourse.

This White Paper presents the nursing response to climate emergencies. We must continue delivering efficient, equitable, quality health services in a climate emergency while reducing healthcare emissions. Nurses are well-positioned to lead the way. The survival of our species depends upon it. Humanity and the planet need nurses like never before.

RECOMMENDATIONS

ACN calls on state, territory, and federal governments to:

- Through the Health, Sustainability, and Climate Unit, implement the National Health and Climate Strategy to promote climate adaptation and engineer climate-resilient healthcare systems.
- Develop a minimum nursing dataset to identify and optimise the geographically diverse nursing workforce to enable a nurse-led, value-based, national healthcare emissions reduction strategy with achievable targets and outcomes administered by a national body.
- Ensure nurses are proportionately represented in the Health, Sustainability, and Climate Unit.
- Provide funding for specialty post-graduate qualifications in climate health, emissions reduction, carbon health literacy, and sustainability to support nurses transitioning into specialty leadership roles.
- Provide funding for a dedicated research grant scheme to expand nurse-led, inter-professional, and cross-sector climate research targeting planetary health, climate change, emissions reduction, and sustainability for clinicians in health care.

ACN calls on nursing education providers to:

- Embed planetary health, climate change, emissions reduction, and sustainability in all undergraduate nursing degrees in Australia to ensure every nurse has access to education and training to respond to climate health, act as climate stewards, and build community resilience.

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