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# Australia's building regulations deny a basic human right for highly vulnerable people: thermally safe social and affordable housing

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## Introduction

Australia is experiencing an acute housing crisis.<sup>1</sup> In response to the particularly concerning dearth of social and affordable housing (SAH) across the country, various levels of government have generated a range of responses. Since 2022, the Commonwealth Government has established the National Housing Accord,<sup>2</sup> the Social Housing Accelerator,<sup>3</sup> and the Housing Australia Future Fund<sup>4</sup> which together, aim to support the delivery of tens of thousands of new SAH in the next 5–10 years.<sup>5</sup> As such, state and territory governments, which are responsible for developing the planning and construction strategies to meet the Commonwealth's ambitious housing targets, are creating new zoning, transport and development plans.<sup>6</sup> Local governments, which bear the economic and social costs of unaffordable housing (such as the dislocation of workers from key industries and services, stagnant economic growth, traffic congestion, homelessness, overcrowding) are charged with implementing these plans. However, all levels of government and construction law have a blind spot in ensuring that newly built SAH is thermally safe for residents who will be required to endure the perils of a warming climate, especially extreme heat events.<sup>7</sup>

Attention to the housing situation is salutary and long overdue. Recently, the National Housing Accord has estimated that approximately 370,000 new homes must be built by 2029 in NSW alone, to reduce the current shortage of housing. To ensure a reasonable proportion of this new housing stock is SAH, the NSW State Government has developed an incentive program. Developers can apply for a floor space ratio or height bonus of up to 30% if the new development dedicates at least 15% gross floor area for SAH.<sup>8</sup> Other states and territories have adopted similar programs (eg, Vic: *Big Housing Build*; Tas: *Housing Strategy Action Plan*). The challenge now is to ensure new buildings meet the needs of current and future residents.

Current building stock of SAH in Australia can be up to, or more than, 40–50 years old. These figures indicate that once provided, SAH buildings will be used for

many decades. In the climate change area, one of the most critical current and future need of residents across Australia is thermal safety, which relates to the capacity of a dwelling to provide habitable and safe space during extreme heat events. In this context, we define extreme heat events as single or consecutive summer days where maximum outdoor air temperatures are at or above 38°C.

Climate change modelling shows that the frequency and intensity of extreme heat events will increase.<sup>9</sup> According to recent research,<sup>10</sup> a high-emissions scenario (RCP8.5–SSP5) will expose the populations of Melbourne, Adelaide and Sydney to 52–, 56–, and 61–times more to extreme heat events by the end of the century, compared to today. Thus, it becomes imperative to stress-check current building standards, especially how they address thermal safety and if they are fit for decades of continued warming and associated extreme summer heat. Analyses have shown that houses, built according to current regulations, will fail thermal comfort requirements in or even before 2040. This, in turn, will require enormous cooling energy needs.<sup>11</sup> If regular homes fail these stress-tests, how will it be possible to provide climate change-ready SAH?

In this article, we first outline how indoor heat impacts human health and how effectively Australia's building standards and codes address the thermal performance of a home. Next, we evaluate how a human rights framework can contribute to helping identify and respond to the urgent question of how to provide SAH that meets the diverse needs of inhabitants in the context of a warming climate.<sup>12</sup> Lastly, recommendations are provided that aim to increase thermal safety of occupants of SAH.

## Heat health

Extreme heat events have disproportionate and devastating effects on the very young, the elderly, those with existing medical conditions, women at risk of maternal and neonatal complications, and those living with low incomes.<sup>13</sup> People who live in SAH are more likely to be

exposed to energy hardship that makes the use of electrical cooling and heating (eg, using reverse cycle air conditioning) unaffordable. The life, health and wellbeing of those most disadvantaged and vulnerable in society is already today most affected by increased heat and will be even more so in the future.<sup>14</sup>

Internationally and nationally, there have been discussions about the acceptable range of air temperatures required for indoor thermal safety. The World Health Organization (WHO), for example, recommends a temperature band of 18–24°C for indoor thermal comfort and sets the minimal risk temperature (ie, the threshold after which mortality increases with air temperature) in warm climates just above 29°C. The Chartered Institution of Building Services Engineers (CIBSE) has a recommended thermal discomfort threshold of above 28°C for living rooms and 26°C for bedrooms. In Australian homes, these levels have already been exceeded.<sup>15</sup>

Over the past two summers, our own research (in preparation for publication) documented that in Western Sydney, residents living in SAH without air conditioning endured 130 days of indoor air temperatures greater than 28°C. There were 34 days that qualified as extreme heat, leading to air temperatures as high as 42.1°C indoors; 20°C above the recommended threshold temperature from the WHO. This demonstrated in rem, an existing risk to human life. We note that outdoor temperatures during the summers of 2022–23 and 2023–24 were nowhere near as extreme as for example during the Black Summer of 2019–20. Hence, it is reasonable to expect that residents of SAH in Western Sydney, as elsewhere, are exposed to even greater levels of extreme heat inside their homes.

The issue with thermal safety is that as ambient air temperature rises, so does the core body temperature. Extreme heat claims more lives in Australia annually, than all other natural disasters combined.<sup>16</sup> In addition to air temperature, the exposure to direct solar radiation, radiant and sensible heat fluxes, windspeed and relative humidity all play a vital role in determining thermal comfort.<sup>17</sup> Furthermore, age, illness and other medical conditions (and some medications) decrease the body's ability to regulate temperature. Increased temperatures can lead to nausea, nosebleeds, heat rashes, heat cramps, heat shock, cardio-vascular problems and elevated morbidity and mortality,<sup>18</sup> particularly for older people and those with existing medical conditions.<sup>19</sup> Heat stress can lead to adverse pregnancy outcomes, and to health issues — and sometimes death — for infants. There are also associations between high ambient temperatures and mental health issues, which can also, in some cases, lead to death.<sup>20</sup> This brief overview of the impacts of heat on the human body and exemplary empirical measurements of air temperatures inside SAH highlight

why it is necessary to ensure thermally safe housing — it becomes a matter of life and death.

## Heat performance of buildings

Several regulatory mechanisms and initiatives in the Australian construction and building management sectors have been developed to counteract or adapt to increasing heat. The National Construction Code (NCC), Australia's "primary set of technical design and construction provisions for buildings"<sup>21</sup> sets minimum standards for building performance related to safety, health, amenity, accessibility and sustainability. In terms of heat and human wellbeing, the assumption underpinning the NCC's provisions on heat is that an acceptable range of indoor temperature will be maintained by electrical heating and/or cooling. Here, the focus is on energy efficiency, with the NCC mandating that buildings must meet a "level of thermal performance" to "facilitate the efficient use of energy for artificial heating and cooling appropriate to (among other things) the function and use of the building".<sup>22</sup> Tightly sealed, airconditioned spaces, therefore, are the gold standard for dealing with periods of extreme heat.

The NCC's focus on energy efficiency requirements, assessed using the Nationwide House Energy Rating Scheme (NatHERS), sidelines the benefits of alternative approaches to heat resilience and mitigation. Natural ventilation, for example, which offers improved resilience to extreme heat, is one method of achieving indoor thermal comfort without air conditioning. Other passive design techniques include house orientation, insulation, double or triple glazing, roof overhangs, vegetation barriers and deflectors.<sup>23</sup> Effective indoor cooling can also be achieved using green façades,<sup>24</sup> green or "cool roof" technologies,<sup>25</sup> and shading of the building envelope by engineered structures<sup>26</sup> or trees.<sup>27</sup> New technologies like algae-based bioshading systems<sup>28</sup> and Super Cool Materials<sup>29</sup> are being developed to further improve cooling of buildings and indoor thermal comfort.

There are limitations to approaches that focus narrowly on energy efficiency. Some of the problems are obvious and are particularly critical in relation to SAH. Poorer quality houses with little natural ventilation will mean that occupants suffer more during periods of increased heat. Innovative materials and technologies like those mentioned previously are rarely used. Electrical fans — a very effective way to improve indoor human thermal comfort during high air temperatures and low relative humidity<sup>30</sup> — and air conditioning systems, will not work when extreme heat causes power black-outs. Furthermore, thermal burdens will be worse in cities because of the compounding effects of climate

change, anthropogenic heat emissions and the phenomenon of urban overheating.<sup>31</sup> In contrast to the widely known Urban Heat Island Effect, that results in warmer ambient air temperatures inside cities compared to landscapes outside cities, urban overheating takes place when cities are exposed to the combination of global and local warming impacts. This results in more frequent and longer-lasting extreme heat events.<sup>32</sup> The health effects of urban overheating are now well-established.<sup>33</sup>

## Housing and the question of human rights

The UN International Covenant on Economic, Social and Cultural Rights (ICESCR), to which Australia is a party, includes the right of everyone to an adequate standard of living, including adequate food, clothing and housing.<sup>34</sup> Other important international conventions to which Australia is a party, such as the Convention on the Elimination of all forms of Discrimination Against Women (CEDAW), Convention on the Rights of the Child (CRC) and the Convention on the Rights of Persons with Disabilities (CRPD) also refer to the right to “adequate living conditions, particularly in relation to housing” (CEDAW)<sup>35</sup> “the right of every child to an adequate standard of living . . . particularly with regard to housing” (CRC),<sup>36</sup> and “the right of persons with disabilities to an adequate standard of living . . . including adequate food, clothing and housing” (CRPD).<sup>37</sup>

Housing is regarded as a fundamental human right for two reasons. First, without adequate housing, basic and universal human functions (sleeping, eating, raising a family) cannot be carried out in security, peace and dignity.<sup>38</sup> Second, without adequate housing, other key human rights cannot be enjoyed and realised. For example, substandard housing jeopardises:

- the right to health (by exposing inhabitants to health issues caused by inadequate sanitation, lack of clean water or exposure to the elements)
- the right to security and safety (by not protecting residents from violence or harassment); the right to education (by not providing children with the stability and conditions that enable learning)
- the right to work (which requires economic stability, a fixed address and a stable environment)
- the right to privacy (because it reduces personal space and the conditions for personal autonomy)
- the right to an adequate standard of living (which includes access to essential services)
- the right to be free from discrimination (inadequate housing increases the risk of discrimination based on socio-economic status) and
- the right to participate in cultural life (which requires stability and security)

The importance of housing is recognised through its inclusion in a range of international and national development standards. Ensuring access for all to “adequate, safe and affordable housing and basic services” is included in Goal 11: Sustainable Cities and Communities of the UN *2030 Agenda for Sustainable Development*.<sup>39</sup> The Australian Government’s *Measuring What Matters* report includes issues of access and affordability of housing within its theme of “security”.<sup>40</sup>

A key issue in understanding and applying the right to housing is determining the meaning and scope of “adequate” housing. In 1991, the UN Committee on ESC Rights (the CESCR) published a General Comment (1991) which specified seven minimum conditions for adequate housing. Housing is required to be safe for the tenant, equipped with working basic amenities, affordable, habitable, accessible, located allowing access to employment, public services and other social facilities, suitable for size and culturally appropriate for the occupant and family.<sup>41</sup> The committee stated that these conditions must be considered in the context of cross-cutting social, economic, cultural, climatic, ecological and other factors, to determine whether housing is “adequate” in any given situation.<sup>42</sup>

Australian courts, which are obliged to consider international human rights standards in interpreting domestic legislation, have recognised housing as the foundation for the realisation of other basic human rights. In 2023, the High Court of Australia considered a case for compensation by a tenant whose premises did not have a back door.<sup>43</sup> The tenant was an elderly First Nations woman living in residential premises in the Aboriginal community of Ltyentye, and the lack of a back door left her vulnerable to animal and human intrusions. The High Court allowed compensation for the mental and psychological harm caused to the tenant by lack of security due to inadequate housing. Blockland J, who originally heard the case in the Supreme Court of the Northern Territory, adopted a definition of “habitable” which includes:

. . . not only the health and safety of tenants but an overall assessment of the humaneness, suitability and reasonable comfort of the premises, even if only basic amenities are provided, judged against contemporary standards.<sup>44</sup>

A human rights approach recognises the intersectionality of issues that impact upon people’s experiences in relation to thermal safety. For example, a level of heat that renders housing adequate for a healthy adult may not be adequate for an older person, a pregnant woman, or a child. As previously stated, older persons find it more difficult to circulate blood to the extremities to cool down; diseases that are common in old age, such as cardiovascular and pulmonary illnesses, cause further

complications to heat-induced stress; medications common in old age also aggravate heat stress. Older persons are more likely to experience fuel poverty, rendering them unable to cool their homes, and older persons as well as families with infants are more likely to spend longer periods of time in the home.

Pregnant women are also more susceptible to heat and the impact of heat stress. For pregnant women, exposure to extreme heat has been associated with “greater risk of pre-eclampsia and gestational hypertension, as well as gestational diabetes”.<sup>45</sup> For infants, the risks of maternal heat stress include “higher risk of low birth weight, congenital defects, cardiovascular diseases, neurological dysfunction and poor mental development”.<sup>46</sup> Socio-cultural factors, poverty, isolation, lack of access to basic services or social support, amplify the risks to older persons, pregnant women or infants during periods of extreme heat. These groups, like all other people, are entitled not only to the right to life but also to “the highest attainable standard of physical and mental health”.<sup>47</sup>

A human rights approach also, critically, draws attention to the broader range of human functions that are needed to enable a full and decent life. In each case, the question is whether a particular measure or approach not only preserves life, but also ensures dignity, promotes autonomy and facilitates active participation in the community. For example, applied to the issue of thermal safety, we know that the ability of children to learn and play is affected by heat, with long-term consequences for cognition.<sup>48</sup> Adaptation and compensatory measures might be available to the wealthy but are beyond the reach of those in SAH. In a context of global warming, the failure to provide thermally adequate SAH exacerbates long-term intergenerational inequality by constraining the human capital formation of particular groups of children. For the individual child, the result is that they are denied their human right to “the development of the child’s personality, talents and mental and physical abilities to their fullest potential”.<sup>49</sup> For society, the result is greater inequality and entrenched disadvantage, which undermines social cohesion and limits economic growth.

We do not currently have a housing construction framework that is sufficiently attentive to the specific needs and characteristics of residents in the context of climate change. Among the factors that must be considered are:

- cost of living and associated energy poverty
- age and mobility of residents
- health status of occupants with elevated heat vulnerabilities that require different thermal conditions

- the imperative of social connectedness and
- educational, cultural and social requirements relevant to different groups of people at different stages of the life cycle

The planning and delivery of new SAH that provide thermal safety in a warming climate is not adequately considered in the technical design standards of the NCC, and equally remain unaddressed in the broader policy frameworks for SAH in Australia. Government inaction will result in increasing, yet avoidable, human suffering and increased inequality.

## Recommendations

A range of reasons exists why thermal safety is vital in modern SAH that meets the diverse needs of inhabitants in the context of a warming climate. To improve the current situation, the following recommendations can lead to increased thermal safety in SAH.

### *Recommendation 1: update building codes*

Current regulations and assessment tools available for designers and builders are not suitable to deliver residential housing, including SAH, that is thermally safe during extreme heat conditions.<sup>50</sup> This is especially the case if assessments solely rely on reverse-cycle air conditioning use during extreme heat events. Climate data used for thermal comfort analyses in NatHERS should be updated to reflect future climate scenarios better, including during extreme heat events.

Broader questions around the role and enforcement of the NCC are also vital in discussions relating to thermal comfort requirements for existing SAH. While the NCC has requirements for energy use and efficiency, these are only for new buildings, and not for existing building stock.

### *Recommendation 2: develop building design guidelines for extreme heat*

Key industry bodies must develop design guidelines for thermal safety in SAH that adequately address human needs in future climates. This includes defining what is meant by “safe SAH housing” as well as the rights of tenants in these scenarios.<sup>51</sup> Furthermore, all levels of government play an important role in developing these guidelines. In Britain, for example, the Housing Health and Safety Rating System (HHSRS), introduced by the Housing Act 2004, allows local authorities to define “hazards” in respect to “the design, construction and maintenance of [a] dwelling”. Hazards were then divided into 29 categories, encompassing areas including psychological, physiological and accident-related risks related to current and future dwelling occupants. Excess heat and excess cold are both listed as physiological hazards.<sup>52</sup> Adapting such a framework to fit

Australia's climate zones and location-specific hazards, including extreme heat, will be a leap forward.

***Recommendation 3: stronger enforcement and control of planning and construction quality***

A knee-jerk response of governments to a housing crisis is usually to fall in line with the call of developers to “cut red tape”. Arguably, the planning system in Australian states and territories is complicated, and deregulation can indeed speed up the delivery of new housing stock. However, experiences from the past have shown that deregulation of state planning systems risks declining building quality, especially for SAH.<sup>53</sup>

In this context, it is necessary to point out that the NCC and associated mechanisms for thermal safety represent minimum requirements, hence they already perform poorly during extreme heat events. To avoid worsening impacts on the health of occupants, it is recommended that any adjustments to procedures and regulations have no impact on the thermal performance of new housing and that any adjustments are subject to frequent and independent site inspections.

***Recommendation 4: increasing and understanding the diverse standards and needs for human occupancy***

Research has demonstrated that matters relating to energy efficiency, especially for those renting a home, cannot be addressed by a single set of government actions, policies or portfolios.<sup>54</sup> This is especially concerning for low-income renters (ie, SAH occupants) who do not have the resources to effectively advocate for cross government/institutional support. Any approach to ensuring thermal safety for SAH must incorporate strong safeguards, that understand and incorporate the diverse and intersectional requirements and experiences of current and future tenants. As suggested,<sup>55</sup> this may involve mandating thermal performance for rental (and other) housing across the nation.

In addition, a balanced discussion among non-government stakeholders and housing providers will be required to agree upon non-negotiable standards for thermal safety. While in this context the issue of “split incentives” is acknowledged (ie, a homeowner pays for greater thermal safety without financially benefitting from it), all available pathways to improved thermal safety in SAH must be explored — from substantially improved minimum standards, to incentive programs for builders and mandatory disclosure of building energy performance.<sup>56</sup>

***Recommendation 5: increase thermal resilience of the wider community***

In addition to establishing thermal safety in SAH, there must be the provision of other effective means that

can directly and indirectly improve community heat resilience. Examples of these means include accessible public cooling infrastructure, nature-based solutions for urban cooling, the utilisation of blue-green infrastructure, cool roof and wellness-check programs, heat action plans and warning systems.<sup>57</sup> At a city scale, strategic expansion of green infrastructure will be a cost effective, long-term intervention to reduce urban overheating and improve living conditions for all urban dwellers, and especially residents of SAH.<sup>58</sup>

**Conclusion**

While new SAH will be built to reduce the pressure on the Australian housing market, this new housing stock must be constructed to withstand the impacts of intensifying summer heat for decades to come. Currently, design standards for indoor thermal comfort in all buildings rely primarily on air conditioning. Yet, even today, the use of air conditioning is unaffordable for many residents of SAH. This situation represents a risk to human health and violates a basic human right. A logical first step towards equitable indoor thermal safety is to improve building design using passive design principles.<sup>59</sup> Reducing heat at the neighbourhood scale is the second step.

After the US, Australia is seeing the second largest number of climate change litigation cases in front of its courts.<sup>60</sup> If indoor thermal safety remains unaddressed by building regulation and construction law, it is reasonable to expect that the number of court cases where the residents of SAH seek compensation for harm from heat will increase. We agree with Boocock and colleagues that “law plays a critical and under-recognised role” in heat management across the built environment and associated public health.<sup>61</sup> Those responsible for ensuring the basic human right of living thermally safe in a home — designers, builders, managers and other built environment professionals — cannot escape questioning, as the evidence for increasing heat and its impacts on health are clear and publicly available.

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**Footnotes**

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