



ETHOS PROJECT

Policy Maker Report

Heat, Health and Digital
Technology Survey
2022



Disclaimer

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Executive Summary

Prolonged exposure to high temperatures is a serious threat to human health, with those over the age of 65 disproportionately vulnerable to heat health impacts and fatalities¹.

Ambient temperatures in Australia have increased by 1.4C since 1910, leading to more intense, frequent and longer lasting extreme heat events (EHEs) with devastating impacts felt across the country². Prolonged exposure to high temperatures has severe heat impacts on the body, particularly for older people who are at a greater risk of mortality and morbidity during extreme heat events³. In Queensland alone, the risk of mortality during heatwaves between 2010–2019 increased by 5%⁴ and paired with future climate modelling, the health impact of these events will be severe^{5,6}.

Taking an innovative approach to this ongoing problem, The Ethos (Extreme Heat and Older Persons) Project is developing an in-home early warning system for older people to assist in monitoring heat exposure, identifying heat health risks, and provide tailored cooling options to support health and independence during hot weather.

To help reach the overall aims of the project, we conducted a state-wide survey aimed at identifying heat health knowledge, coping strategies and digital technology habits of older Queenslanders.

Developed from the findings of the survey, this report outlines the following:

- Heat health knowledge and risk perceptions among older Queenslanders
- Behaviours of older Queenslanders during periods of hot weather
- Hearing and responding to heatwave warnings
- Attitudes towards and use of digital technologies

The survey was completed by a sample of 547 Queenslanders over the age of 65, via either an online or paper-based format between the 15th September – 8th December 2022.

Overview of Key Findings

75%
of
respondents
were
unaware of
heat health
impacts



Despite 87% of respondents reporting to have a chronic health condition, 78% had never been told by a healthcare provider that their health condition makes them more sensitive to heat.



Despite most respondents recognising the heat vulnerability of over 65s and those with chronic conditions, only 20% felt they were personally more at risk than their peers.



Respondents scoring high in heatwave concern for themselves or family were significantly more likely to perform most personal and ambient cooling behaviours during hot weather.



Of the 43% of respondents who had heard heatwave warnings in the past, only 49% chose to change their behaviour in response to the heatwave warning.

47%
of
respondents
had never
heard a
heatwave
warning

Overview of Key Findings



Respondents living alone were 56% less likely to have air conditioning and those with air conditioning were 79% less likely to use their air conditioning if they lived alone.



Fans (92%), air conditioners (85%), changing clothes (56%) and increasing fluids (52%) were the most common cooling strategies during hot weather.

79%
of
respondents
felt some-
what to very
confident in
using digital
devices

21%
of
respondents
indicated not
having, or
using, air
conditioning



Though 85% of respondents had a smart phone, 94% indicated a preference for heatwave warnings and related heat information from television sources.



Only a small percentage of respondents indicated needing daily (3%) or weekly (4%) assistance to complete online tasks. 68% indicated that they never needed help.

Overview of Policy Implications



Targeted and nuanced heat health awareness campaigns identifying heat as a serious health issue, are urgently required.



Increased heat health education in primary and allied healthcare settings to improve heat risk awareness in older patients.



Improving heat warning messaging to include emphasising vulnerabilities and effective cooling strategies and refuges



Increasing financial and social supports to enable cooling options for older persons, particularly those living alone.



Catering to the needs and concerns of older persons if using technology to improve health outcomes.

The results of this work indicate a variety of policy measures which could be implemented to help improve the health and wellbeing of older Queenslanders during extreme heat events. With these recommendations, we seek to engage with key stakeholders to further identify and discuss policy needs.

As extreme heat events are a growing threat and related health impacts are largely preventable, we recommend implementing these measures to enhance the resilience of older Queenslanders and mitigate unnecessary mortality and morbidity that would otherwise unfold.

For full policy implications, see page 35.

Introduction

Background

Extreme and unprecedented heatwaves are becoming more common across the world due to anthropogenic climate change. Our insatiable appetite for finite resources to power, feed, clothe and transport us is causing serious consequences to the health of our communities. Rising global temperatures have led to severe heatwaves, straining healthcare services with higher rates of illness and mortality^{7,8}. Indeed, the 2022 heatwave in Spain and Portugal resulted in 1,700 heat related deaths⁹, demonstrating that the health impacts of climate change are no longer abstract, far away scenarios – they are real, they are possible and they are happening now.

Heat in Queensland

Australia has already seen ambient temperatures increase by 1.4C since 1910² and in Queensland, climate models project that the year 2030 will experience over 18 heatwave days¹⁰. Such trends are concerning for public health, as Queensland data from 2010–2019 demonstrates a 5% increase in mortality risk during heatwaves⁴, highlighting the urgent need for heat adaptation. Older persons (those over 65) in particular have an increased risk of heat related mortality and morbidity due to physiological changes, compounded by an increased likelihood of experiencing medical, social and economic conditions which exacerbate risk¹.

An ageing population

The number of older Australians are also increasing, with projections indicating this

population rising from 16% to 21-23% by 2066¹¹. Such projections further increase the need for timely research to mitigate future public health catastrophes for this group.

Early Warning Systems

The role of early warning systems has been identified as a protective factor for reducing heat-related health harms¹², however, population based warning systems are not tailored to an individual's environment, nor adequately consider preferences or access to cooling options. Consequently, current systems lack an accurate prediction of individual risk.

Considering this, the Ethos Project is developing an in-home early warning system for older people to assist in monitoring heat exposure, identifying heat health risks, and providing tailored cooling options to support health and independence during hot weather. To inform the development of the system, we conducted a survey for older Queenslanders to understand their heat health knowledge, heat behaviours and views on digital technology.

Aim

To explore the perspectives of older Queenslanders regarding heat-health risk and response and utilisation of personal/digital technologies to assist in that response.

Methodology

The Ethos survey drew on the published work of Garcia and Fernley¹³ which identifies the critical links in early warning systems (EWS) for natural hazards. EWS are used in the disaster risk management space to provide timely warnings to populations at risk. These warning systems are people centred with four key components: i) risk knowledge, ii) detection, monitoring, and forecasting, iii) building response capacity and preparedness, and iv) communication or dissemination of information.

Our omnibus survey collected data on these four key areas and also captured the demographics of older Queenslanders. Sections were designed with three key objectives to determine: knowledge and attitude towards heat as a health problem, attitudes and use of personal and monitoring technologies, and behaviours in responding to heat stress and messaging.

The 144 question survey was disseminated to participants either through an online mode using an online survey panel, or an identical paper-based mode. Differences in data collection was deemed important to prevent bias in the technology section of the survey.

Responses were collected between mid September – early December 2022. The online format collected responses between 1st – 15th of November and the paper based mode collected responses from the 15th of September – 8th of December 2022.

Paper-based survey participants were recruited using flyers, media channels, local

events and personal and professional networks within the Ethos Project team. The survey was open to anyone over the age of 65 and living in Queensland, however the paper based mode was exclusive to Queenslanders over the age of 75. This decision aimed to accommodate those over 75 who may not be using or have access to digital technology, as we anticipated lower technology usage among this demographic.

Steps taken to ensure data quality included:

- For paper-based questionnaire, data was entered using the codes set for the online questionnaire.
- Data entry was completed by a member of the research team and 10% was checked for consistency by another research team member.
- Quality checks were run using Python to find outliers or records that did not meet quality checks.
- Data collected by the online survey panel were subjected to all key quality checks to find outliers or responses that did not meet the desired criteria.

Following these steps, the online and paper-based data was merged together for analysis.

For complete details on the survey, please refer to the [Technical Report of the Ethos Survey.](#)

Hi, I'm Hazel

I'm 84 and these days, it's just me. I miss my adult children but I try not to bother them. They have their own families to worry about. But I'd be lying if I said the house didn't feel empty since my husband passed. Health wise, I'm alright. I take tablets for high blood pressure and even though I've got arthritis in my knees, I still get around in my garden. I had a bad fall recently so my son, Joe, organised a carer. She's good company, but the bills are increasing because she makes me put on the air con. Yes its hot, but that's Queensland. I'll be fine. Besides, air con is a luxury when you're living alone on a pension.



I'm learning how to use this new smart phone I got. I mostly use it to see photos of the grandkids, but Joe showed me how to use this health app that reminds me to take my medications. I like playing with the little gizmo but need a bit of help. Sometimes it seems to have a mind of its own!

Goals

Stay healthy to keep gardening, increase social interaction, save money on air conditioning while staying cool.

Challenges

Mobility issues due to a fall and arthritis, Widowed and on a fixed income so concerned about aircon costs, socially isolated.

Attitudes & Perspectives

Accepts the heat in Queensland however she feels it is part of life. Open to using digital technology but would like more assistance with using it.

Heat-Health Awareness

Unaware of her increased sensitivity to heat due to age, health and social conditions. Would prefer to use traditional methods to stay cool rather than air conditioning.

Health Management

Appreciates the company of her carer. Open to using health applications to help manage health conditions.

Channels

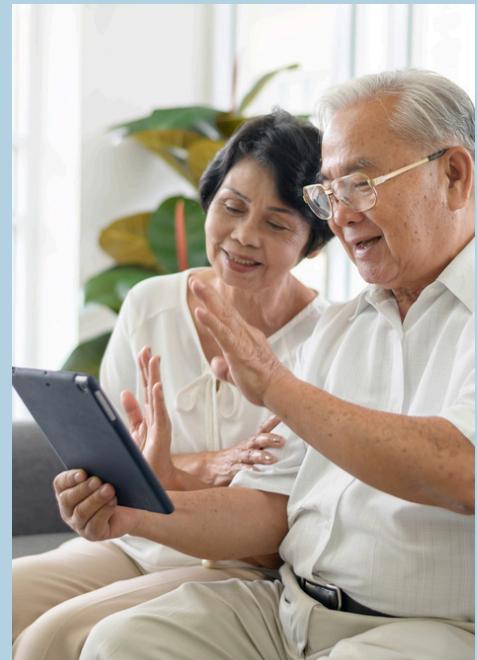
Hazel prefers face to face interactions, but is getting more comfortable using her phone for calls and text messages.

Heat Risk: HIGH

Social isolation, financial constraints and chronic health conditions all increase Hazel's heat health risk. Regular check ins and increased heat-health awareness and messaging may help her stay safe in the heat.

Hi, I'm Truong

I'm a 72 year old from Vietnam, but moved to Brisbane over 30 years ago with my wife Linh and our children. We love it here and the heat is tolerable. Certainly cooler than Vietnam. As I still have some family overseas, I like to stay in touch with them using video calling. I'm no tech expert but I'm learning. I have an iPhone and iPad, I use both of them daily for managing time, blood sugar, appointments, everything! I also got a smart TV from my son last year and its great! The bank teller showed me how to do online banking, and I also do that now too. I'm trying to get Linh into online banking, but she's worried about sharing her details.



We're used to the heat but on hot days, we change up our routines – I check the weather on my phone and make sure to complete house tasks before it starts getting too hot. I'll also wear cool clothes and drink lots of water. I like eating cold foods too like fruit and ice cream but I can't have too much because of my diabetes.

Goals	Learn how to use new technologies and apps, continue adapting to the heat by maintaining awareness and adjusting routines.	Challenges	Stay up to date with advancements, help Linh overcome digital hesitancy, avoid excess sugar consumption during hot weather.
Attitudes & Perspectives	Shows a positive attitude towards using and learning technology despite not being an expert. Feels confident changing routines to manage heat on hot days.	Heat-Health Awareness	Shows awareness of heat by modifying activity on hot days, checking weather, and demonstrating personal cooling behaviours to manage thermal comfort.
Health Management	Uses technology to check blood sugar and appointments, also tries to be aware of food choices on hot days.	Channels	Loves using technology to stay connected with family, enjoys video calling, watches TV and uses apps to stay up to date on weather.

Heat Risk: MODERATE

Despite his age and medical condition, Truong takes many steps to keep healthy in the heat, such as monitoring the weather and performing cooling behaviours. Having tailored information about his heat risk from his GP would further enhance his heat resilience.

Results

Figure 1. Queensland Climate Zones¹⁴



Queensland Climate Zones

Zone 1: Tropical

Hot and Humid

Zone 2: Sub-Tropical

Warm and Mild

Zone 3: Hot Arid

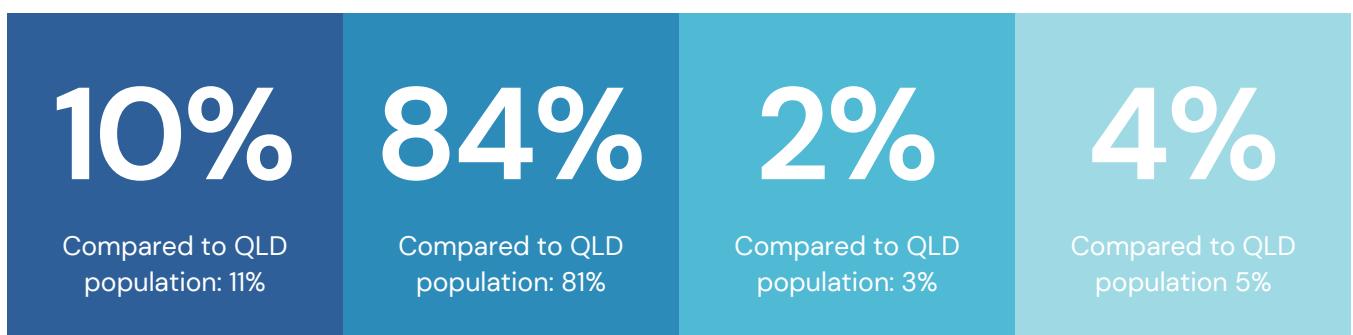
Hot and Dry

Zone 5: Warm Temperate

Warm and Temperate

Demographics

Ethos Sample Representation from Climate Zones compared to Queensland population statistics from the Australian Bureau of Statistics (ABS) (2023):¹⁵



According to the ABS, 5.2 million people live in Queensland, with approximately 850,000 being over the age of 65¹⁵. A survey sample of at least 384 was required for the results to meet 95% confidence level with 5% margin error. Being a large state with several different climate zones, it was deemed necessary to apply quotas to climate zones rather than gender or age, to ensure the most accurate representation of older Queenslanders and the nuanced perceptions, knowledge, and behaviours during hot weather. The quotas were based on ABS data with an aim to mirror those portions as closely as possible.

Personal Demographics

The following table provides an overview of the Ethos survey respondents compared to Queensland older population data obtained by the ABS. In addition to the below information, survey respondents indicated:

- 30% were born overseas compared to 29% of older Queenslanders¹⁶.
- 38% reported that they were in good health compared to 41% reported in Griffith University's Climate Action Survey¹⁷.

Table 1. Personal Demographics of Respondents

Age	Age Group	Ethos Sample (%)	QLD (%) ¹⁵	
			65-74	75+
	65-69	24	30	
	70-74	29	27	
	75-79	28	19	
	80-84	12	12	
	85+	7	11	

Financial Status	Financial status	Ethos Sample (%)	QLD (%) ¹⁷	
			Struggling	Doing okay
	Struggling	17	17	
	Doing okay	47	47	
	Comfortable	33	30	
	Financially well off	3	6	

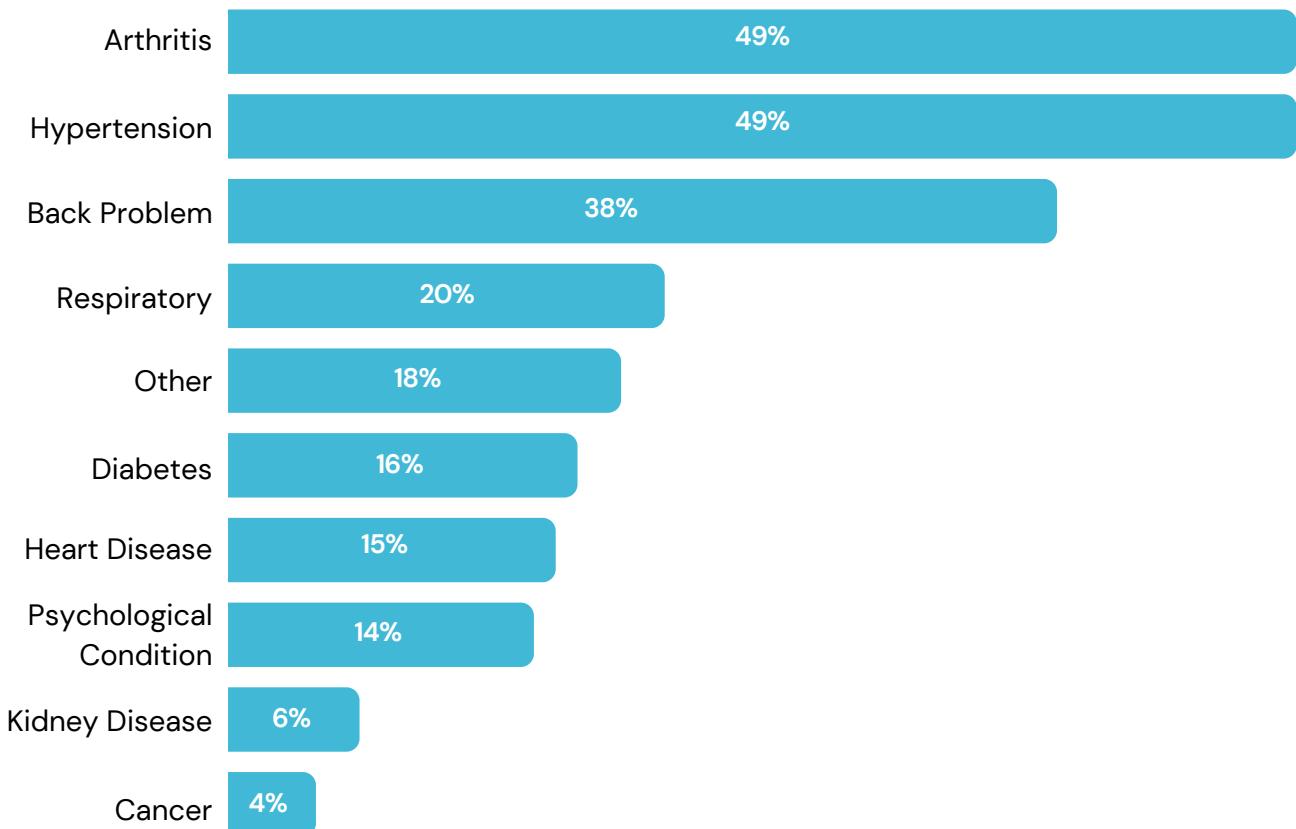
Educational Attainment	Education	Ethos Sample (%)		QLD (%) ¹⁶	
		65-74	75+	65-74	75+
	Bachelor and above	24	27	15	9
	Certificate III, IV, Diploma	39	33	27	22
	Year 10 and above or Certificate I & II	36	35	39	36
	Year 9 and below secondary	1	5	19	33

Gender	Gender	Ethos Sample (%)	QLD (%) ¹⁵	
			Male	Female
	Male:Female	53:47	49	51

Understanding and behaviour in response to heat is influenced by health, social and economical environments. Diseases impacting cardiovascular, respiratory, renal, endocrine and neurological systems, increase a person's risk by interfering with thermoregulation. Mobility, disability, socio-economic status and social connectedness are also key influences for heat health impacts.

Health Status

Figure 2. Chronic Conditions of Respondents



Though 87% of respondents indicated having a chronic health condition, most respondents rated their health as either "good" (38%) or "okay" (37%), with only 12% and 13% of respondents rating their health as either "very good" or "poor", respectively.

Loneliness

The University of California, Los Angeles (UCLA) Three-Item Loneliness Scale was used to examine social engagement and connectedness among respondents. This scale was used due to its simplicity (3 questions, simple scoring and academically rigorous)¹⁸. Scores from each question are added together to give a total score ranging from 3-9, with higher scores (>6) indicating loneliness. Though most (76%) respondents had a total score of 5 or lower, 24% of respondents scored 6 or higher, indicating loneliness. Further analysis of loneliness demonstrated relationships with living alone and respondents' self reported financial status.

Key Findings

1

Heat health knowledge among older Queenslanders

A significant portion of respondents (75%) did not know that heatwaves could impact their health and 30% of respondents didn't know that persons with chronic conditions are hospitalised more than those without during high heat. When answering each question evaluating their heat health knowledge, a significant level of "don't knows" were provided, suggesting that heat health knowledge among older Queenslanders is low.

2

Personal perception of heat health risk

Despite recognising heat vulnerability of over 65s and those living with chronic health conditions, personal perception of heat health risk was low among respondents. Of the 87% of respondents who reported living with a chronic health condition, 61% had at least one heat-sensitive health condition, however only 20% felt they were more at risk of heat health impacts compared to others their age.

3

Help seeking behaviour of older Queenslanders during heat

Most (89%) of respondents felt comfortable seeking help during extreme hot weather. Family (59%) was the most favoured contact, followed by a General Practitioner (GP) or nurse (49%). However, despite being the second most favoured contact, 78% of respondents had never been told their health status makes them more sensitive to heat health impacts.

4

Cooling strategies of older Queenslanders during heat

Respondents utilised a variety of environmental and personal cooling strategies, with fans (92%) being the most popular, followed by air conditioning (85%). When asked about air conditioning use, 24% set the temperature above the recommended 24C. For respondents who did not have or use air conditioning (22%), cost was identified as the most common barrier.

Key Findings

5

Living alone and air conditioning use

Further analyses of respondents who did not have or use air conditioning demonstrated a significant relationship with living alone. Respondents living alone were 56% less likely to have air conditioning, and respondents living alone with air conditioning were 79% less likely to use it during a heatwave. These concerning results suggest potential challenges for the heat health safety of older Queenslanders living alone.

6

Heatwave warnings and response

Only 43% of respondents reported ever hearing a heatwave warning in the past, and 10% of respondents indicated they were unsure if they had heard a warning or not. Of those that heard the warning, less than half (49%) behaved differently in response. Television (94%) was identified as the most preferable source for obtaining heatwave warnings, followed by radio (78%) and mobile phone (77%). These results suggest gaps in heatwave warning dissemination and efficacy.

7

Technology use and attitudes of older Queenslanders

Most respondents (79%) reported that they felt somewhat to very confident using digital devices, and 68% of respondents reported never needing assistance with online tasks. Internet access was also high, with 94% of respondents having internet at home. The most commonly used applications among respondents were social media (78%) and government apps (68%).

8

Key digital concerns for older Queenslanders

Despite a high percentage (94%) of respondents having internet at home, 64% of respondents agreed that internet costs prevent them from using digital services. Moreover, when asked why respondents chose not to use some applications, privacy and security (29%), confidence (23%), not interested (23%) and not feeling as though the app was necessary (21%), were the main reasons.

Section

1

Heat Risk Knowledge & Perception



At a Glance

Percentage of respondents with increased heat-health risk factors:



Have a heat-sensitive health condition (61%)



Live alone (32%)



Need help with household chores (28%)



Feel socially isolated (24%)



Have a disability (22%)



Struggle financially (17%)



75% of respondents knew little to nothing about the health impacts of heatwaves, and 85% of respondents knew little to nothing about the causes of heatwaves.



42% of respondents indicated that they were either "fairly" (24%) or "extremely" (18%) concerned about heatwaves directly affecting themselves or their family.



When asked about their sensitivity to heat, **40% of respondents felt sensitive**, while an additional **14% felt extremely sensitive to heat**.



79% of respondents reported experiencing at least one heat-related health symptom during a period of hot weather, however only 4% reported being badly affected.



End of survey open text responses explaining thoughts about heat and health:

"Usually heat doesn't worry me too much it is when the humidity gets very high. It sucks the energy out of me."

"What you are calling extreme heatwaves was commonplace in years gone by and if you did a bit of research you would not find that the high 30's is new or different and that people before the namby pamby age lived with these temperatures without air conditioning"

"I have age, experience, instinctiveness, and common sense to tell me if it's hot, and how to take care of myself. I don't need any digital thing-a-me-jig to tell me what my instincts do naturally."

"The hottest summers I can remember were during the 1960's when I first started work as a carpenter. They affected me more than anything since."

"Although heat is uncomfortable, it can be dealt with and/or put up with."

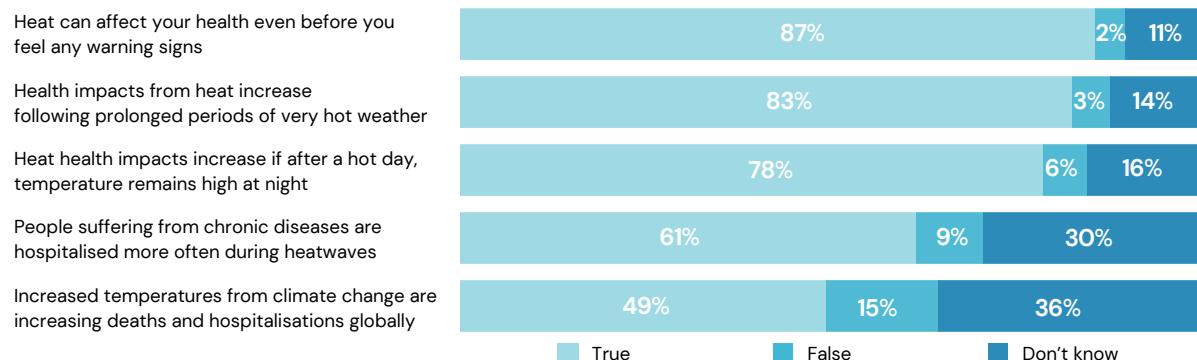
"People are too soft & demanding and should simply get used to heat. It's been around forever."

Heat-health Knowledge

To provide a baseline for understanding heat risk knowledge among older Queenslanders, questions in this part of the survey were designed to evaluate respondent's current knowledge and attitudes towards heat as a health problem, along with asking respondents about previous health experiences during periods of extreme heat.

Of the respondents who were living with a chronic health condition (87%), over a quarter (30%) didn't know that persons diagnosed with chronic conditions were hospitalised more than those without, during periods of extreme heat.

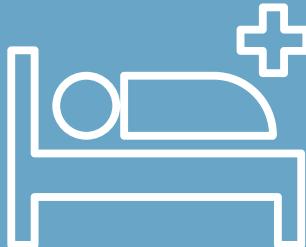
Figure 3. Heat Health Knowledge



A significant level of "don't know" for each statement suggests a lack of heat health awareness, emphasising the need to raise awareness among older Queenslanders.



Respondents identified **over-65s (88%)**, those with **chronic diseases (79%)**, and **physically active workers (73%)** as most sensitive to heat health effects, while **only 19% indicated socially isolated persons at risk**.



To understand respondent's knowledge of health impacts from heatwaves, respondents were asked when they believed these extreme events were most dangerous to people's health. **75%** indicated that heatwaves were most detrimental throughout the summer period, whereas **only 7% indicated the beginning of summer**, and **6% believed the end of summer were most dangerous**. **12% indicated that they "don't know"**.

Heat Concern

Respondents were asked a series of questions to understand their concern around heat, hot weather and heatwaves. **40% of respondents indicated that they considered themselves sensitive to heat.**

Figure 4. Heat Concern for Self or Family

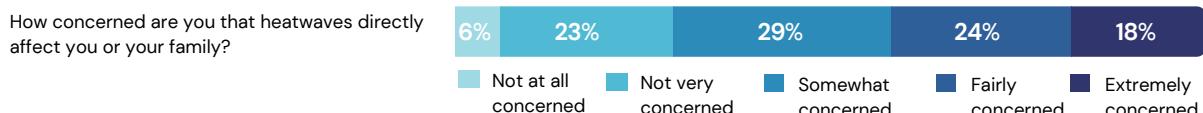


Figure 5. Heat Concern for Region

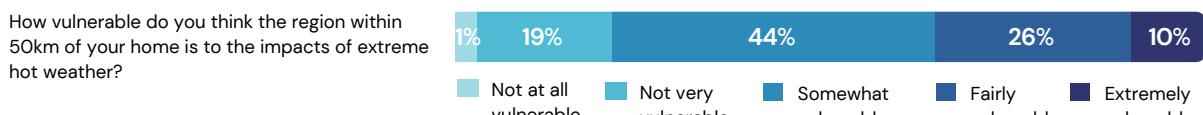


Figure 6. Heatwave Concern for Australia

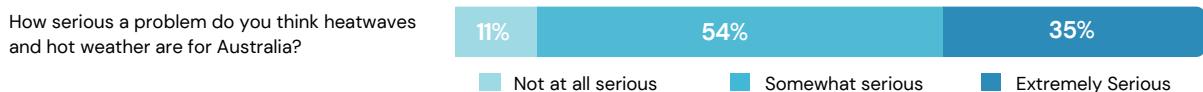


Figure 7. Heat Perception of Personal Sensitivity



Despite 87% of the cohort indicating they had a chronic health condition, **only 20% felt they were more at risk of heat health impacts compared to others their age.**



Female respondents were more likely to consider themselves sensitive to heat and were more concerned about heatwaves impacting their family, region and Australia.

Of those that felt more at risk, respondents indicated this was due to:



Pre-existing health conditions



Sweating more than others



Feeling the heat more than others



Being an older person



Experiencing heat health symptoms



Difficulty coping in hot weather

Heat Risk

Respondents were asked a series of questions to understand their previous experiences during extremely hot weather and whether they experienced any health issues during these times.

Figure 8. Heat Health Experience

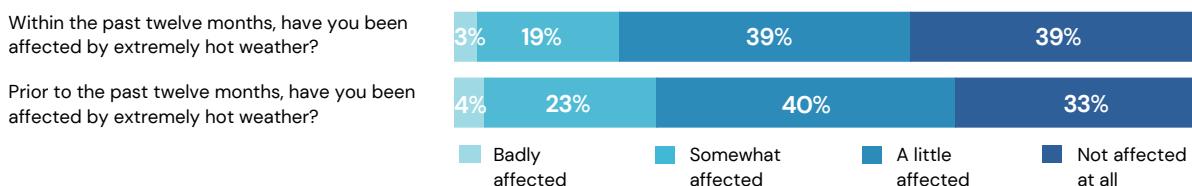


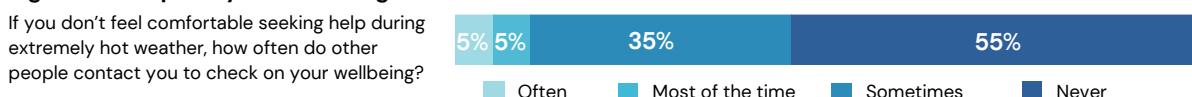
Figure 9. Informed of Heat-Health Risk from Health Professional



Figure 10. Comfort in Seeking Help During Hot Weather



Figure 11. Frequency of Wellbeing Check-ins From Others



Those seeking help during hot weather favoured contacting **family** (58%) and **GP/nurse** (49%), followed by **friends** (24%), **neighbours** (24%), and **personal carers** (3%). “Other” selections identified calling 000.

Respondents with **heart conditions** (81%) and **high blood pressure** (80%) indicated they had **never been told by a health professional** that they are more sensitive to heat.

Of those that had experienced heat health symptoms, the most common included:



Anxiety (67%)



Nausea/ vomiting (44%)



Sleep disturbances (42%)



Fatigue (43%)



Muscle cramps (42%)



Dehydration (36%)

Section

2

Heat Behaviour



At a Glance

Respondents indicated the following home cooling options to reduce hot weather:



Fans (94%)



Air conditioning (86%)



Blinds and Awnings (76%)



Windows and doors with fly/security screens (74%)



Outdoor living areas (71%)



Insulation in ceilings (65%) or walls (28%)



Roof overhang/ wide eaves (44%)



Large windows and doors (44%)



Shady Plants (26%)



Respondents also mentioned having **pools, trees, grass lawns, cross breezes, whirly birds, shutters, and heat reflective paint** to reduce heat at home.



The most frequently used personal cooling strategies on a very hot day were **adjusting clothing (56%)** and **increasing fluid intake (52%)**.



Respondents scoring **high in heatwave concern for themselves or family** were **significantly more likely** to perform **most personal and ambient cooling behaviours** during hot weather.



After hearing a **heatwave warning**, the most common behaviours performed were **staying indoors, increasing fluids, using air conditioning, using fans, and avoiding outdoors**.



Open text responses explaining what changes were made to the home to make the temperature more comfortable in hot weather included:

- “Installed solar to afford the a/con”
- “Thicker curtains to help reduce indoor heat”
- “Purchased a large mobile umbrella for my terrace”
- “Insulated my westerly facing garage”
- “Replaced venetians with shutters”
- “Installed air vents in roof”
- “Closed in the patio”

Air Conditioning

Participants were asked a series of questions to understand their behavioural responses to hot weather. This section examined air conditioning use extensively, however we were also interested in what other measures respondents implemented to cool themselves or cool their home/environment. **22% of respondents indicated that they did not have, or did not use, air conditioning.**

Figure 12. Household Air Conditioning Use and Availability



Figure 13. Duration of Air Conditioning Use in Hot Weather

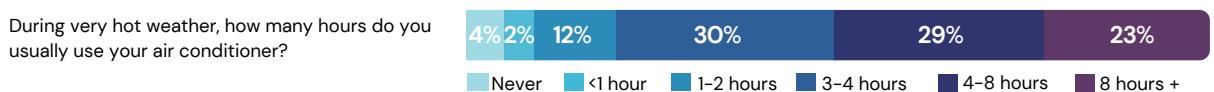


Figure 14. Frequency of Air Conditioning Use in Hot Weather

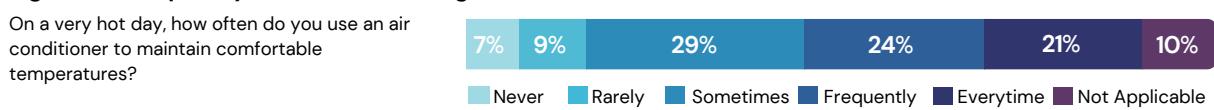
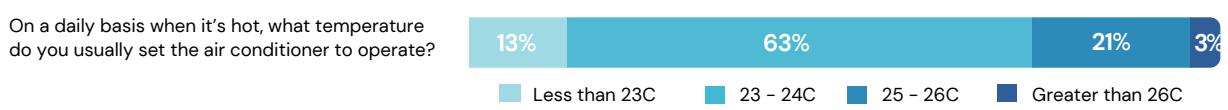


Figure 15. Temperature of Air Conditioning During Hot Days



Respondents living alone were 56% less likely to have air conditioning, and those living alone with air conditioning were 79% less likely to turn it on during heatwaves.



Air conditioning was most common at midday (41%), late afternoon (37%), and evening (29%), with 25% using at night and 18% with visitors. Few indicated morning (8%) or all day (11%) use.

The most common reasons for not having or using air conditioning included:



Cost (30%)



Uncomfortable (10%)



Noisy (10%)



Prevents fresh air (7%)



Unnecessary where I live (7%)



Bad for my health (5%)

Ambient Cooling

This section examined cooling behaviours that focus on modifying the surrounding environment to create a cooler space.

Figure 16. Use Frequency of Ambient Cooling Devices

On a very hot day, how often do you use the following to maintain comfortable temperatures?

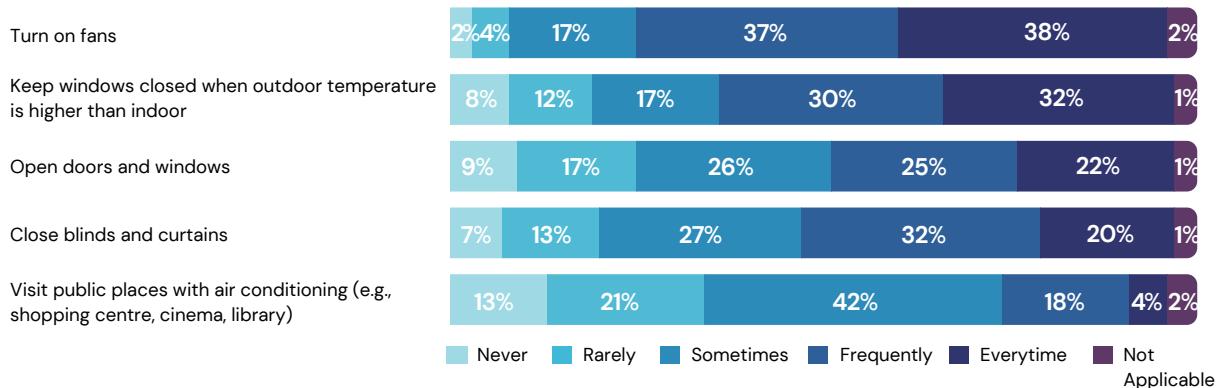


Figure 17. If Respondents Had Made Cooling Changes to Home

Have you made changes to your home to make the temperature more comfortable during hot weather?



The main reasons for not making changes to their homes was due to **not feeling it was needed** (44%), living in a **rental home** (24%), and changes being **unaffordable** (12%).



The top four most popular cooling changes included adding **air conditioning** (37%), **fans** (25%), **blinds and awnings** (22%), and **security screens to doors and windows** (20%).



Open text responses explaining ambient cooling behaviours after hearing a heatwave warning:

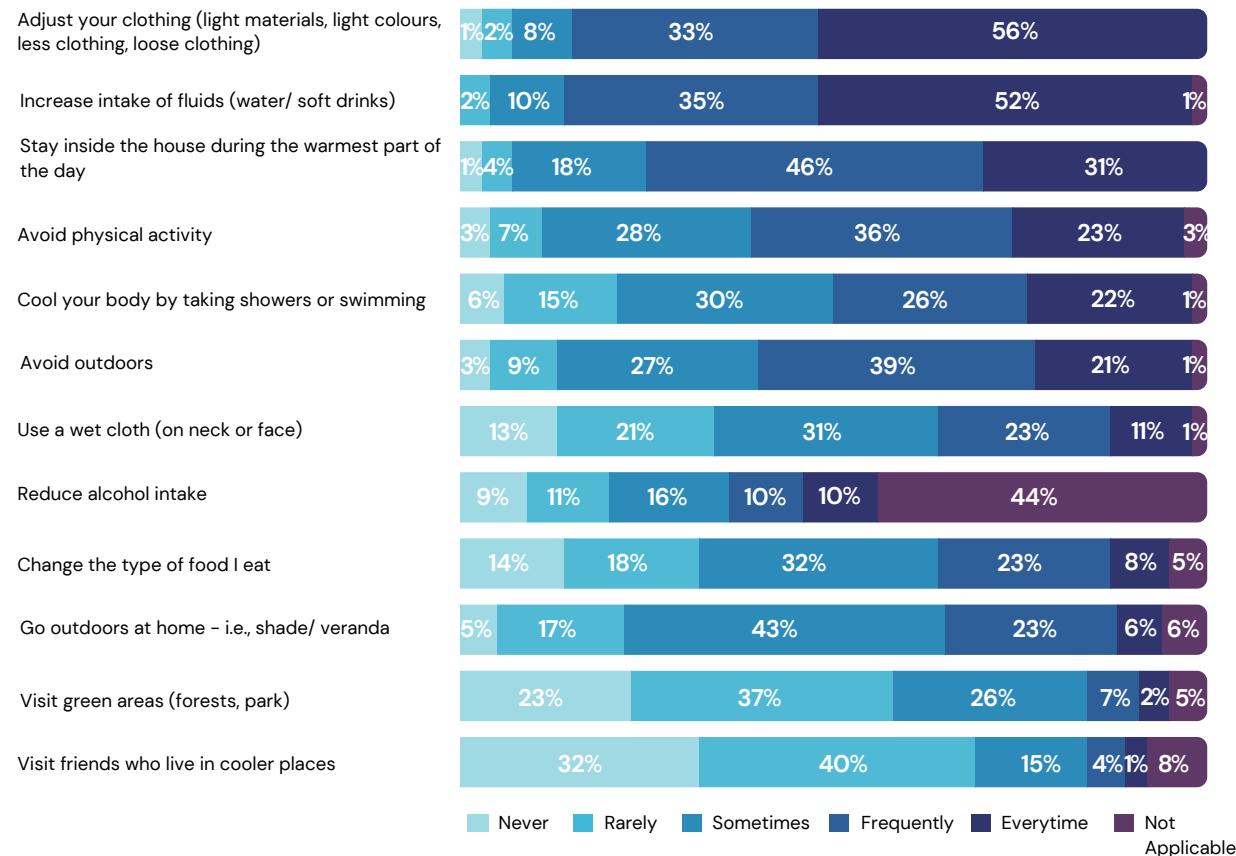
- "Opened windows at night to trap cool air in and **shut windows before dawn**."
- "I ended up at the **shopping centre** to stay cooler."
- "**Close the windows and doors** to keep the heat out. Let the **[air conditioner]** do its job."
- "Hung out in **air conditioned places** more- clubs, shopping malls; **used own air con sparingly**; vegetated on couch with **pedestal fan** full on"
- "Turned up the **air con** and isolated to that room"
- "Cold water in fridge; **closed windows**; pulled blind across; stayed inside more"
- "Prepared for the coming heatwave by reassuring that my **air conditioner** was in **good working order**."
- "Kept the **house closed** also blinds."
- "Stayed indoors with the **air conditioner** on"
- "Stayed at home. Kept cool with a **damp cloth** and **fans**."

Personal Cooling

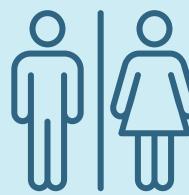
This section looks at the actions participants took to directly manage their body temperature or immediate surroundings to increase thermal comfort during hot days.

Figure 18. Frequency of Personal Cooling Behaviours

On a very hot day, how often do you use the following to maintain comfortable temperatures?



Respondents who **felt they were personally more at risk of heat** were significantly more likely to **use a wet cloth, avoid physical activity and avoid outdoors** during hot weather.



Gender influenced cooling strategies, with males significantly more likely to reduce alcohol, and females significantly more likely to use a wet cloth, adjust clothing and stay indoors during hot weather.



Open text responses explaining personal cooling behaviours after hearing a heatwave warning:

"Unless it was something urgent I would **not leave the house** but would **stay home** and **take it easy** under ceiling fans and/or aircon [...], **drinking plenty water** even if I didn't feel particularly thirsty."

"Wear hat, drink lots water, come in shade"

"Avoiding strenuous outdoor activities. Keeping up my fluids"

"I put face washers in the freezer and put them on my face to cool me down"

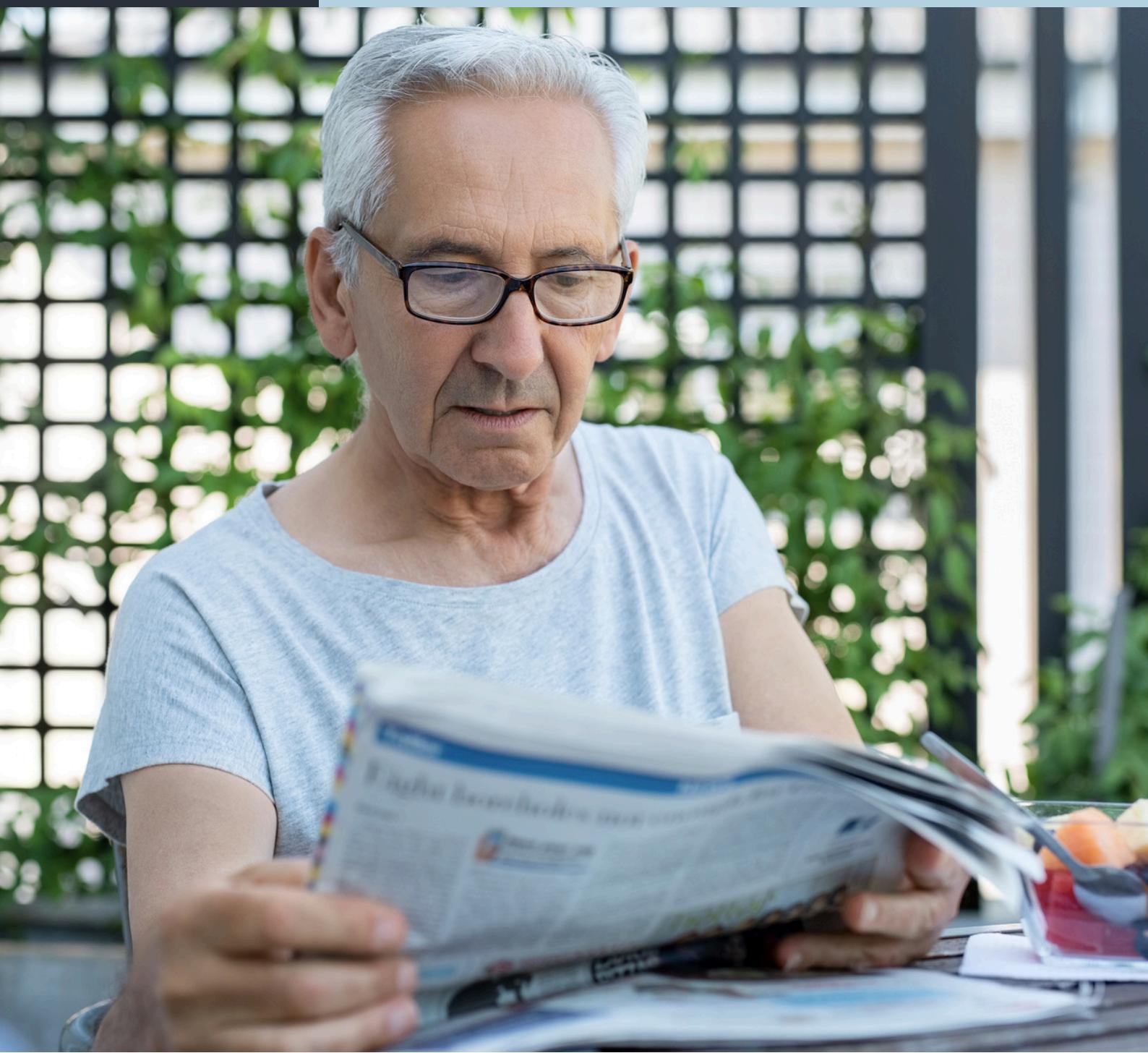
"Change plans to work in the garden"

"Just dressed in cooler clothes and drank more water than usual"

Section

3

Heatwave Warnings



At a Glance

Participants were asked a series of questions to understand whether they had heard any heatwave warnings or heat preparedness information previously and the source of information.

Respondents indicated the following media sources as the most preferable for providing heatwave warnings or heatwave related information:



Television (94%)



Radio (78%)



Mobile phone (77%)



Computer / internet (67%)



Family / friends / neighbours (62%)



Newspaper: Online (48%) or printed (40%)



59% of respondents indicated **general printed media** as the least preferable media source for heat warnings or preparedness information.



Respondents indicated a strong preference for **traditional forms of media**, such as **television** and **radio** over mobile phones to provide heatwave warnings and heat information.



Participants who **felt they were at risk of heat** were **1.7 times more likely** to hear heatwave warnings and **3.1 times more likely** to perform cooling behaviours in response to the warning.



Further analysis of results indicated there was **no association** between **hearing a heatwave warning** and **age, gender, education, income or health status**.



47% of respondents **had never heard a heatwave warning**, and 10% of respondents **were unsure if they had heard a heatwave warning or not**. Of the remaining 43% of respondents who had heard a heatwave warning, **only 49% chose to change their behaviour** in response to the warning.

Heat Warnings

Participants were asked a series of questions to understand whether they had heard any heatwave warnings.

Figure 19. Hearing Heatwave Warnings



Figure 20. Time of Heard Heatwave Warning



Figure 21. Behaviour Change due to Heatwave Warning



For those that heard a heat warning, where did you obtain heat related information or the heatwave warning?



Television (40%)



Radio (17%)



Weather Apps (17%)



Family/ Friends/ Neighbours (8%)



Mobile phone (7%)



Internet websites (6%)



Printed Newspaper (6%)



Online newspaper (5%)



State Emergency Services (5%)



Further analysis indicated there was **an association between changing behaviour after hearing a heatwave warning and self-reported financial and health status.**

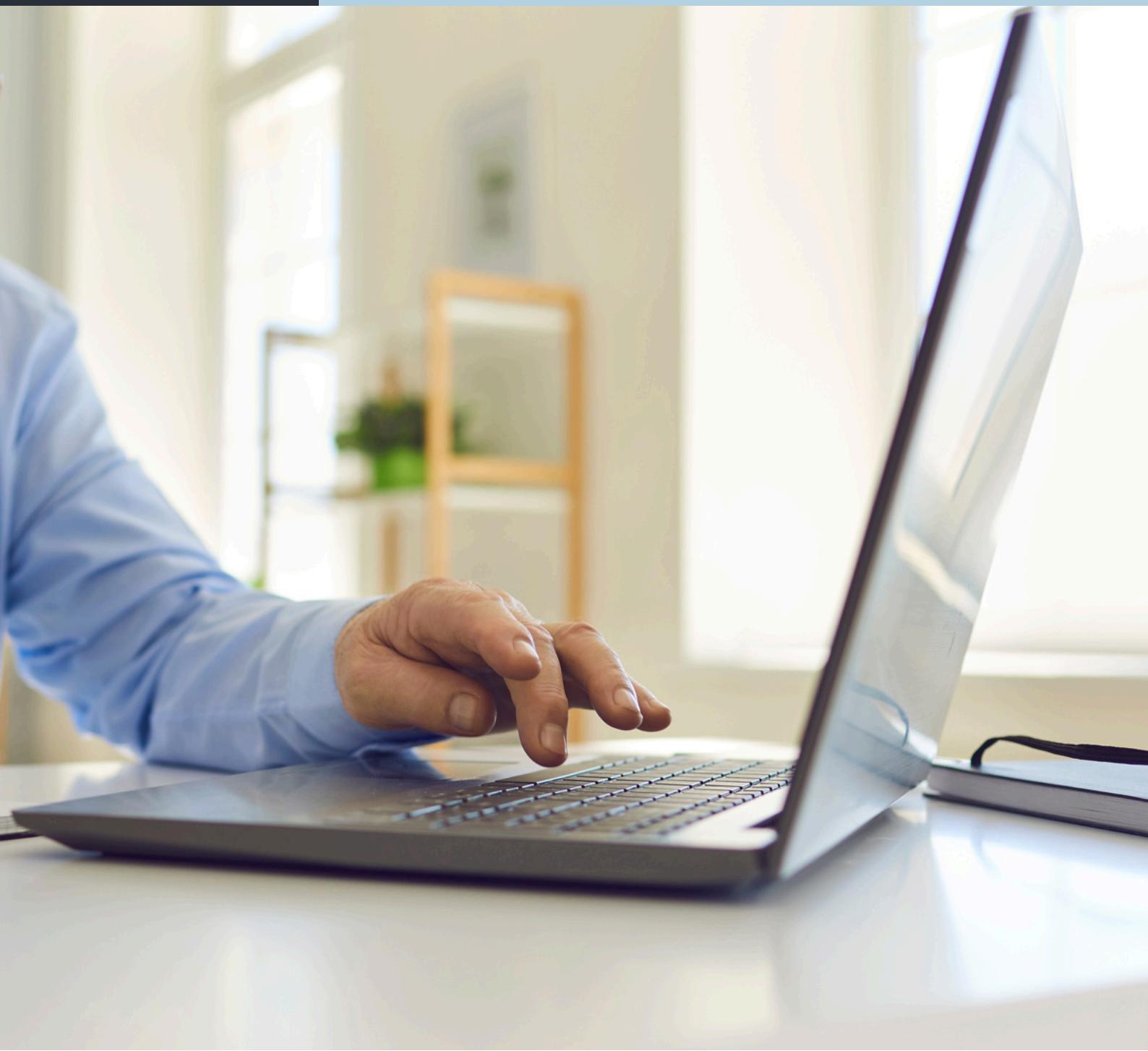


Though **traditional media** is preferred for heatwave warnings, **prior research** has highlighted that **heatwave media coverage tends to include positive imagery** of people at the beach, rather than heat-health impacts¹⁹.

Section

4

Digital Technology



At a Glance

Participants were asked a series of questions to understand their digital technology use and acceptance. The following is a general digital profile of the Ethos survey participants.

The most common personal devices used by respondents were:



Smart phone (85%)



Smart TV (65%)



Laptop (59%)



Tablet (55%)



Desktop computer (48%)



Virtual assistant devices (22%)



35% of respondents feel that they are **very confident using digital technology** such as computers, smart phones and other electronic devices.



The most commonly used applications were **social media apps (78%)** followed by **government apps (68%)**. A small portion of respondents (13%) did not use any apps.



94% of respondents indicated that they had **internet access at home**. Reasons for not having internet at home included **cost, not interested, unsure of how to use it** and **unreliable connections**.



Key digital concerns from respondents centred around **security and privacy, confidence in use** and **necessity of application or digital service**.



When asked about preferences for learning a new digital technology, **39%** of respondents preferred learning via **printed guides or manuals**, followed by **websites and YouTube videos (31%)**. Only **10%** preferred **learning in small groups**.

Attitudes

This section examined the attitudes of respondents towards digital devices and technology.

Figure 22a. Statements Regarding Attitudes Towards Technology (5 Point Scale)

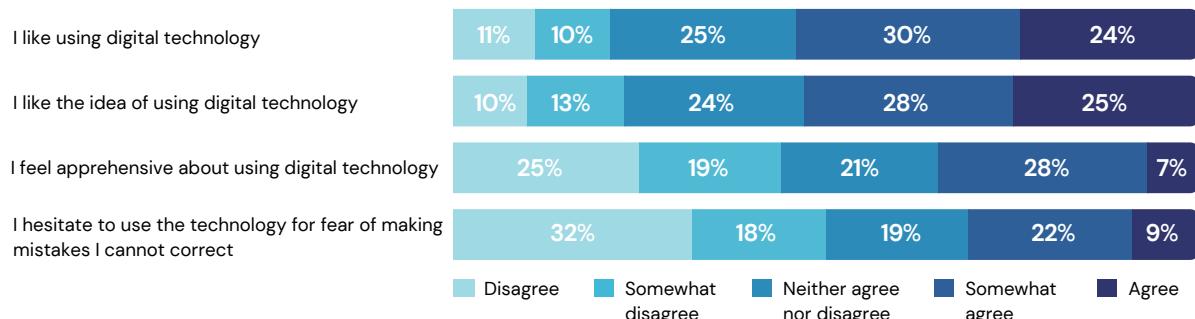
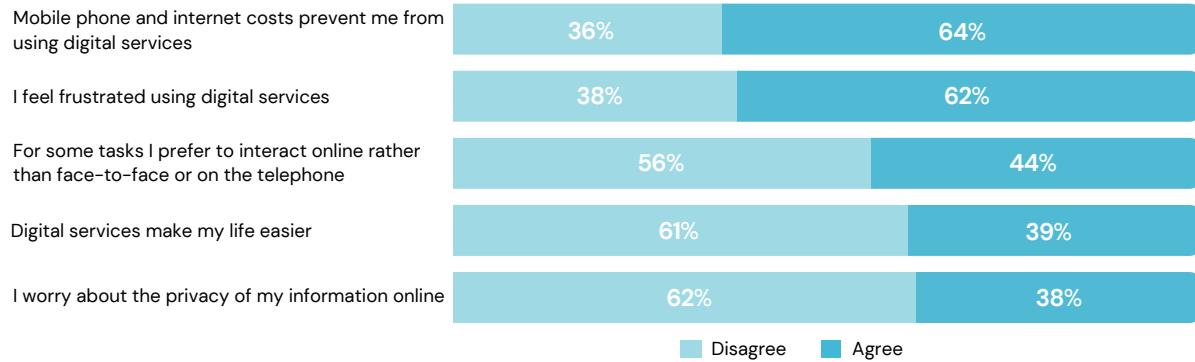


Figure 22b. Statements Regarding Attitudes Towards Technology (2 Point Scale)



49% of respondents felt technology has had equally negative and positive effects on society, with 35% indicating mostly positive, 15% indicating mostly negative effects and 1% unsure.



Respondents over 75 years old and respondents with health conditions were significantly more likely to feel frustrated when using digital devices.



End of survey open text responses demonstrating attitudes towards digital technology:

- “Digital technology certainly is excellent for telehealth consultations etc.”
- “Fed up with all these technologies. Will come a time we will not be able to think for ourselves let alone even walk to another room.”
- “I am well retired (age 82) former systems analyst/designer. I look on computers as a tool, not as a toy or entertainment device – The downside of computing, especially social media, is it makes people detached from human to human interaction [...]”
- “I find it very difficult to trust the digital world”
- “I have no time for digital technology and is not comfortable for my health.”
- “I use digital technologies to update me and help me if necessary.”
- “I was brought up in a world without most of todays technologies but I was ready to live and learn about them.”

Learning Tech

Participants were asked a series of questions to understand how they learn how to use digital technology.

Figure 23. Confidence Learning New Technology

How confident are you to learn a new kind of digital technology or related application?



Figure 24. New Device Assistance

When you get a new electronic device, do you usually need someone else to set it up or show you how to use it?

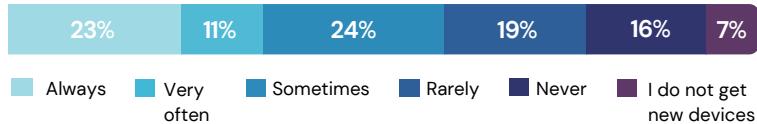


Figure 25. Statements Regarding Feelings Towards Learning New Technology

Please say whether you agree or disagree with the following statements

I would like more training using digital services

42% Disagree 58% Agree

I would like to use digital services if provided with support on using them

52% Disagree 48% Agree

Legend: Disagree (light blue), Agree (dark blue).

The most common preferences to learn new technology were:



Printed user guides or manuals (39%)



Websites & videos (31%)



Within a small group (10%)



Via talking on the phone (7%)



I don't want to learn new tech (5%)



Face to face (4%)



Open text responses explaining preferences for learning new technologies:

"Being able to afford a qualified tutor with the ability to communicate with me without me feeling incapable to learn."

"Nerdy friend!"

"Learning more, myself, by helping others."

"Research reviews and instructions online, download pdf manuals and manufacturer specs."

"Trial and error."

"Teaching myself."

"I have been a member of a Computer Club for many years so we all help each other."

"Follow Google prompts."

"Figuring it out for myself until I hit a snag - then I refer to YouTube or the manual."

"Brisbane Seniors Online."

Technology use

Participants were asked a series of questions to understand their technology and application use, as well as their confidence using technology.

Figure 26. Confidence Using Digital Technology for Online Tasks

How confident are you using electronic devices to do the things you need to do online?

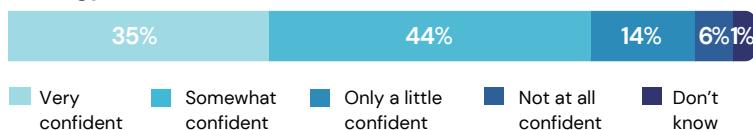
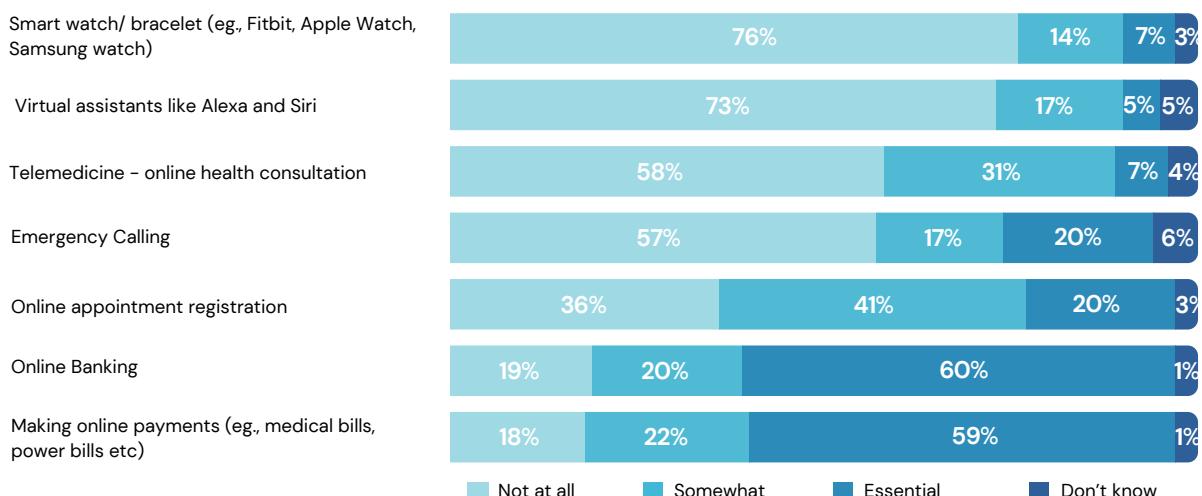


Figure 27. Daily Needs for Digital Services

Respondent's day to day needs for digital services:



When asked how often they asked **someone else to complete an online task** for them, **68% said never**, **16% said less than once a month**. Only 3% required daily help, and 4% needed weekly help.



31% of respondents were **happy to use any apps**, however, **privacy concerns (29%)**, **lack of confidence (23%)**, and **uninterested (23%)** were the top reasons for non-usage.

Open text responses explaining why respondents chose not to use applications:



"Downloading inexperience."

"Only use apps where there is no easy alternative."

"I don't like **being spied upon** by whoever runs the phone especially Google. This is one way for **scammers to get your personal data**."

"I don't like most social media apps or their modus operandi so I don't use them and have all my personal details vacuumed up by them."

"I only use things with which I am familiar so I can't comment on my app usage"

"I use a computer on the internet, only use my smartphone as a communication device - PS I am very computer literate - worked in computing since 1972"

"Prefer brain power to work things out than to be told when and how to think"

"Uses up too much phone memory and battery time"

Section

5

Next Steps



Policy Implications

Based on the findings of our heat, health and digital technology survey, we suggest the following recommendations to help support older Queenslanders during extreme heat.



Targeted awareness campaign identifying heat as a serious health issue particularly for over 65s and those with chronic conditions

- Our findings highlight a significant gap in awareness of heat as a serious health issue. 75% of respondents indicated they knew little to virtually nothing about heat-related health consequences and further, though 87% reported having chronic health conditions, only 20% felt they were more at risk of developing heat-health conditions compared to others their age. This disparity points to the need for more nuanced heat-health campaigns which consider age and chronic health conditions.
- Our findings also indicate that increased concern and risk perception play a protective role against heat-related health risks. Respondents scoring high in concern for heatwaves impacting themselves or family (18%) were more likely to hear heatwave warnings and perform cooling behaviours in response. Further, those who perceived themselves to have an increased risk of developing heat-health issues (20%) were significantly more likely to perform several personal cooling behaviours during hot weather. However, only small percentages of our cohort fall into these categories, suggesting that building heat-health awareness among this population is essential to prevent unnecessary suffering.
- Finally, we suggest ongoing monitoring of heat-health awareness following the implementation of awareness campaigns to ensure effectiveness. Additionally, as the vulnerability of risk continues to evolve and expand, it is crucial for messaging to remain current and relevant.



Provision of advice: The role of GPs and allied health explaining heat-health risks to their older patients/ clients

- There is a critical need for general practitioners (GPs) and allied health professionals to discuss the impact of heat with their patients during periods of elevated temperatures. Despite most respondents (87%) reporting to have a chronic health condition, 77% indicated never being informed by healthcare professionals about their increased heat-health vulnerability. Nevertheless, almost half of respondents (49%) expressed willingness to consult a GP or nurse if feeling unwell during hot weather. Based on this, we urge GPs and allied health professionals to discuss heat-health action plans and make recommendations around cooling to patients during periods of hot weather.
- In addition, we suggest increased awareness of heat and its impact on mental health. 67% of our respondents experienced anxiety during hot weather, indicating the need for further research into mental health and other heat-related symptoms. Given the high prevalence of chronic health conditions among respondents, further research is needed to explore potential symptoms that may manifest during periods of heightened temperatures.

Policy Implications



Enhanced heatwave warnings and messaging

- Nearly half (47%) of respondents had never heard a heatwave warning, despite these warnings being released by the Bureau of Meteorology (BOM). Of the remaining 43% who had heard these warnings, only 49% changed their behaviour in response. These findings indicate the need to enhance heatwave warning and messaging, particularly by enhancing information about vulnerable populations and promoting cooling behaviours to stay safe.
- The delivery of heatwave warnings needs to be considered. 94% of our respondents indicated TV as their most preferred method for heatwave warnings and related information, with 40% of those who heard a warning receiving it from TV. We suggest that televised heatwave warnings should incorporate appropriate imagery to encourage heat-protective behaviours and highlight risk factors.
- Lastly, insights into air conditioning use showed 24% of respondents were setting their air conditioning higher than the recommended 24°C, suggesting this may be to increase energy efficiency. To address this, heatwave messaging should include recommendations for cooling strategies, such as using air conditioning at a higher temperature with a fan to enhance thermal comfort while managing costs effectively.



Increased cooling and social support for older persons, especially those living alone

- Despite high air conditioning use within our cohort, a significant portion (21%) did not have or use air conditioning, even during hot weather, with cost identified as the key deterrent. Our respondents had a similar financial status in comparison to the Queensland population, suggesting similar air-conditioning use among the broader older Queenslander population.
- After further analysis of air conditioning use, we found those living alone were 56% less likely to have air conditioning, and those living alone with air conditioning were 79% less likely to turn it on during heatwaves. This suggests a need for financial subsidies for older people living alone to offset the cost of air conditioning or upgrade their homes to increase heat resilience, alongside increased awareness raising of effective air conditioning use.
- Cooling refuges were underutilised by respondents, with many opting to stay indoors during heatwaves. These results are concerning as it may increase heat exposure for those without air conditioning, and contribute to social isolation for those living alone. We suggest increasing supports for older Queenslanders, which could involve community outreach programs to check in and assist individuals to cool refuges.

Policy Implications



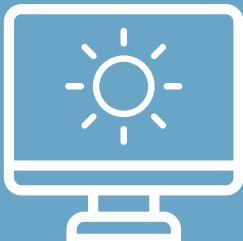
Technology needs and considerations for older people

- Though almost all of our respondents (94%) had access to the internet at home, 64% agreed that mobile phone and internet costs prevented them from using digital services. As cost was also identified as a key reason for those who did not have internet at home, policy implications should focus on ensuring equitable access to the internet and digital services for older populations, especially among those facing financial and digital literacy constraints.
- When asked about application use, only 13% of participants indicated not using any apps. Of those that did use apps, the most popular were social media (78%) or government apps (68%). Key reasons for not using apps were related to privacy (29%), digital confidence (23%), not being interested (23%) and not feeling as though the application is necessary (21%). These findings suggest a need to increase digital literacy and safety among older Queenslanders, as well as involve older Queenslanders in the development of essential applications, such as those used for providing important health and safety information or services during emergencies, such as heatwaves.
- Though most of our cohort felt confident using digital technologies and services (79%), for policy implications aimed at improving digital literacy, printed guides or manuals (39%) were identified as the most preferable, followed by websites and YouTube videos (31%). As technology will continue to evolve and change rapidly, it is necessary that emerging digital health technologies intended for this demographic caters to their learning requirements and preferences.

Project Activities

The Ethos Project is a transdisciplinary project based at Griffith University and funded by Wellcome Trust. As a multi-year project, there are several associated activities and ways to be involved:

Ethos In Home Heat-Health Warning System Technology Trials



Our team invites eligible persons to register their interest in participating in our in-home trials for our early warning heat detection and response system for the 2024–2025 summer period. For more information, please contact our team at: [https://www.griffith.edu.au/research/climate-action/climate-transitions/heat/ethos-project/registration-form](https://www.griffith.edu.au/research/climate-action/climate-transitions/health/ethos-project/registration-form)



Community based events for older people, carers, policy makers, technical experts and researchers to discuss present and emerging heat health issues.



Focus group discussions within smaller groups to explore more in-depth issues raised through other research activities.



Reference group of older Queenslanders and personal carers to help ensure the project considers unique perspectives of our target demographic.



Community of Practice of persons working in the domains of heat, older persons, health and technology to share knowledge and best practice.



Developing more **project related videos** to help promote project activities and increase awareness of emerging issues in the extreme heat and older persons research space. To view examples of our heat health awareness videos, click the link below: <https://youtu.be/qjhvok5VXBA?si=Vb1vSZAeRNj2I3ik>

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We thank you for your
ongoing support for
our extreme heat and
older persons
research



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