DeathTech Research Team
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The Future Cemetery Survey 2021

Summary Report

Introduction

This document summarises the results of the second national public survey for The Future Cemetery research project. It contains an explanation of the method followed by a brief overview of findings. The full detailed results of the survey are available in an accompanying spreadsheet entitled *Future Cemetery Survey 2021 Results*.

The questionnaire design, analysis and reporting for this survey were conducted by Dr Fraser Allison with assistance from the DeathTech Research Team.

DeathTech Research Team

The DeathTech Research Team is a multi-disciplinary group of scholars at the University of Melbourne and the University of Oxford, with expertise in the fields of sociology of technology; cultural and material anthropology; media and communication studies; and human-computer interaction. Current members (listed alphabetically) are Dr Fraser Allison, Prof. Michael Arnold, Prof. Martin Gibbs, Dr Hannah Gould, Assoc. Prof. Elizabeth Hallam, Mr Samuel Holleran, Prof. Tamara Kohn and Dr Bjørn Nansen.

The team has investigated issues related to death and technology for more than a decade, with outcomes generated from three major projects funded by the Australian Research Council. More information is available at the DeathTech website: https://deathtech.research.unimelb.edu.au/

The Future Cemetery project

The contemporary Western cemetery, dedicated to the dead and their memorials, has become more than a pervasive urban landmark. It is also a central site in the emotional lives and cultural histories of local communities. However, this model faces several challenges, including growing environmental concerns, rising maintenance costs, and an increasingly complex range of public desires for death care.

Around the world, cemeteries have begun to adopt new technologies to improve their visitors' experiences, reduce their facilities' environmental footprints, and extend the personalisation of services in response to diversifying community desires. These technologies include the potential for digital augmentation of grave management and visitation, alternatives to conventional burial and cremation, and new designs for landscaping and flora.

The Future Cemetery project is being conducted to identify and critically assess the potential of innovative technologies to enhance the public's experience of the cemetery, diversify service offerings and strengthen community connections, all in the context of rapidly changing circumstances.

The Future Cemetery project is supported by the Australian Research Council and the Greater Metropolitan Cemeteries Trust (ARC Linkage Project number LP180100757).

Method

The survey was designed and analysed by the DeathTech Research Team at the University of Melbourne, and administered online using the Qualtrics survey platform.

A total of n=1,053 respondents completed the survey. Respondents were screened to ensure a representative sample of the Australian adult population, stratified by age, gender and state or territory of residence. All respondents were 18 years of age or older.

The survey was conducted between 22 April 2021 and 11 May 2021. This was during the Covid-19 pandemic, around 13 months after government social restrictions came into effect across the country. None of the questions in the survey explicitly referred to Covid-19. However, some asked about "the last 12 months", approximating the first year of widespread disruptions across Australia due to the pandemic.

The survey contained questions on the following topics:

- What you would like to be done with your body after you die (final disposition)
- Whether you attended a funeral in the past 12 months, in person or via streaming video
- How often you visited a cemetery in the past 12 months and for what purposes
- What activities, if any, you think cemeteries should be used for beyond interment of the dead
- Attitude towards limited-tenure grave ownership
- Attitude towards five technologies for online memorialisation or remote visitation of a grave or funeral
- Attitude towards eight technologies for augmenting the experience of visiting a cemetery
- Respondent demographics

The survey results are reported at the overall level and broken down by age, gender,[1] education, religiosity and Catholicism (see Table 1). This segmentation was settled upon following an exploratory analysis. Various other segments were excluded due to insufficient sample size or lack of statistically significant differences in the results.

Table 1 Respondent categories by which the results have been reported.

Category	Segment Label	Segment Definition	Count	Percent
Overall	Overall	All respondents	1,053	100%
Age	Younger age group	Aged 18–34 years	352	33%
	Middle age group	Aged 35–54 years	341	32%
	Older age group	Aged 55 years or older	360	34%
Gender	Female	Female	545	52%
	Male	Male	503	48%
Education	Degree	Completed a Bachelor's degree or higher	335	32%
	No degree	Not completed a Bachelor's degree or higher	718	68%
Religiosity	Religious	Identified with a religious or spiritual group	566	54%
	Non-religious	Did not identify with a religious or spiritual group	487	46%
Catholicism	Catholic	Identified with Catholicism	183	17%
	Non-Catholic	Did not identify with Catholicism	870	83%

Differences between the segments in each category were evaluated with two types of statistical tests. Chi-square tests were used to determine whether the overall pattern of responses to each question differed in a statistically significant way (e.g. whether the results indicate that people from the younger, middle and older age groups have different responses to a question such as "What would you like to be done with your body after you die?"). Pairwise z-tests were used to determine whether the selection of specific responses differed in a statistically significant way (e.g. whether the results indicate that people from the younger age group are more likely to choose

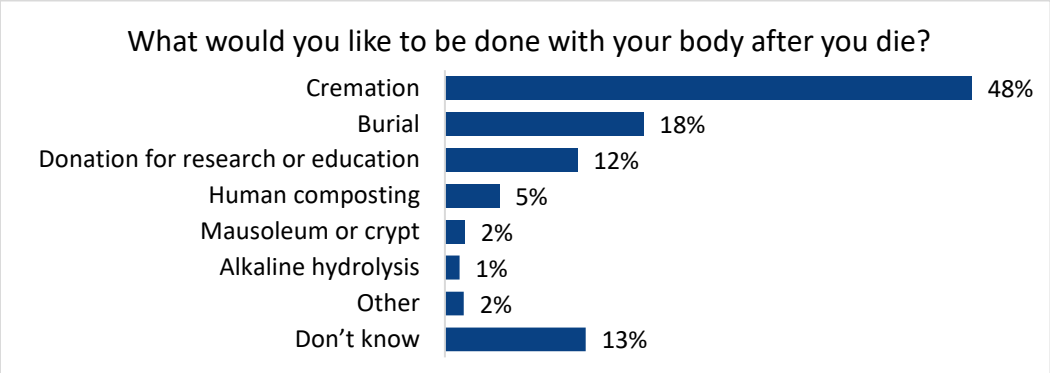
[1] Five respondents selected "Non-binary or other" as their gender. These respondents are excluded from the Gender segmentation due to small sample size. Their results are included in all other categories.

a particular response to a question, such as “cremation”, compared to those from the middle and older age groups). This report focuses on the results of the pairwise z-tests. The full set of test results are shown in the accompanying spreadsheet entitled *Future Cemetery Survey 2021 Results*.

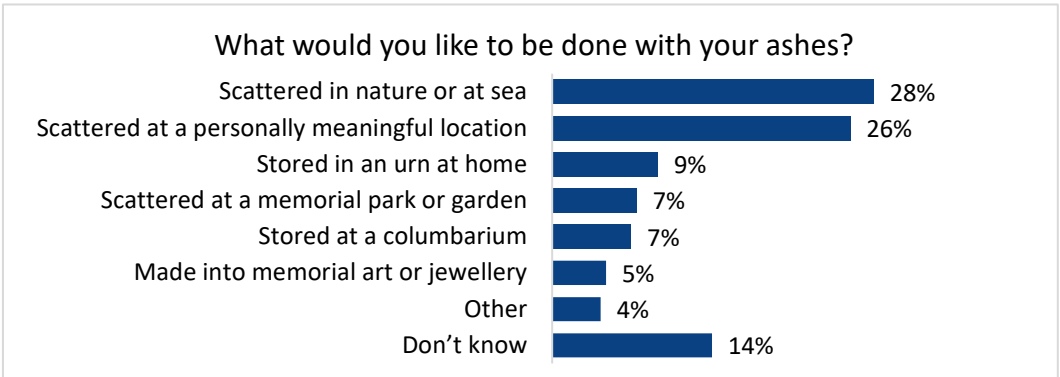
Results

Final disposition preferences

The survey asked respondents what they would like to be done with their body after they die. Cremation was by far the most popular choice (48%), particularly among the older age group (62%). Burial (18%) was a distant second. Burial was more popular among religious respondents (22%), but even they were more than twice as likely to choose cremation (46%). A substantial minority (12%) preferred to have their body donated for use in medical research or education. One in twenty respondents (5%) would like their body to be converted to soil through human composting—also known as natural organic reduction—and this was somewhat more popular among the younger age group (8%). All other options were chosen by fewer than 2% of respondents, besides “don’t know” (13%). Women (16%) were more likely than men (9%) to say they did not know what they would like to be done with their body after they die.

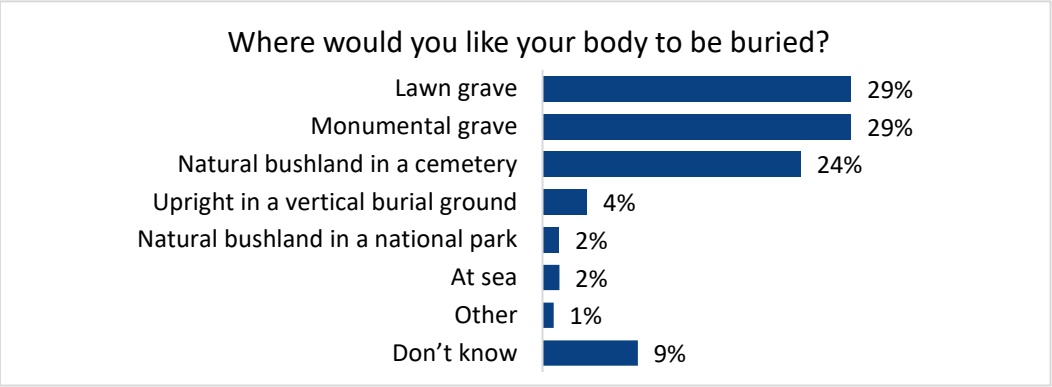


The respondents who chose to be cremated[2] (n=641) were asked what they would like to be done with their ashes. The majority (61%) chose to be scattered, whether in nature or at sea (28%), at a personally meaningful location (26%), or at a memorial park or garden (7%). Small numbers preferred their ashes to be stored in an urn at home (9%) or at a columbarium (7%), or to be made into memorial art or jewellery (5%). Respondents from the younger age group were more likely to want their ashes to be stored in an urn at home (15%) or made into memorial art or jewellery (11%). Being scattered at a memorial park or garden was more popular among men (11%) than women (4%). Storage at a columbarium was slightly more popular among the religious (9%), while being made into art or jewellery was slightly more popular among the non-religious (7%).

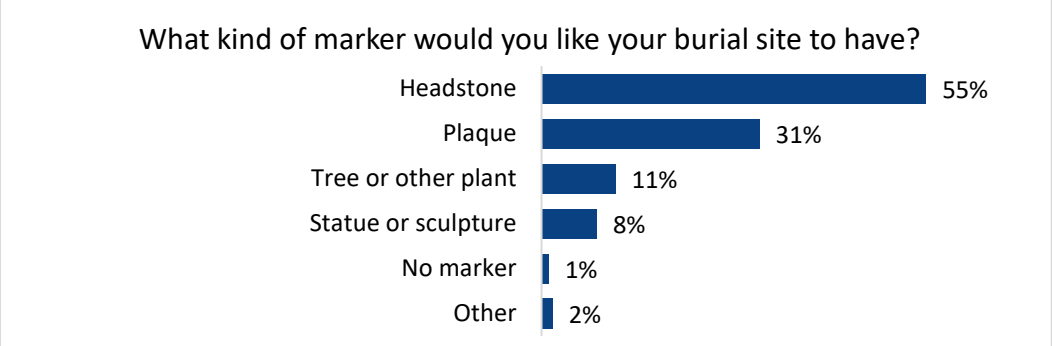


[2] This question was asked of respondents who chose any of the following: to be cremated (48%); to donate their body for medical research or education (12%), after which the body is typically cremated; or to undergo alkaline hydrolysis (1%), a process that reduces the body to bone dust and is sometimes called “water cremation”.

The respondents who chose to be buried (n=189) were asked where they would like to be buried and how they would like their burial site to be marked. The most popular locations were in a traditional lawn grave (29%) or monumental grave (29%), followed by an area of natural bushland within a cemetery (24%). Lawn graves were particularly popular among the older age group (50%) and Catholics (41%). Few chose to be buried in an area of bushland in a national park (2%), although this option was somewhat more popular among the non-religious (5%).

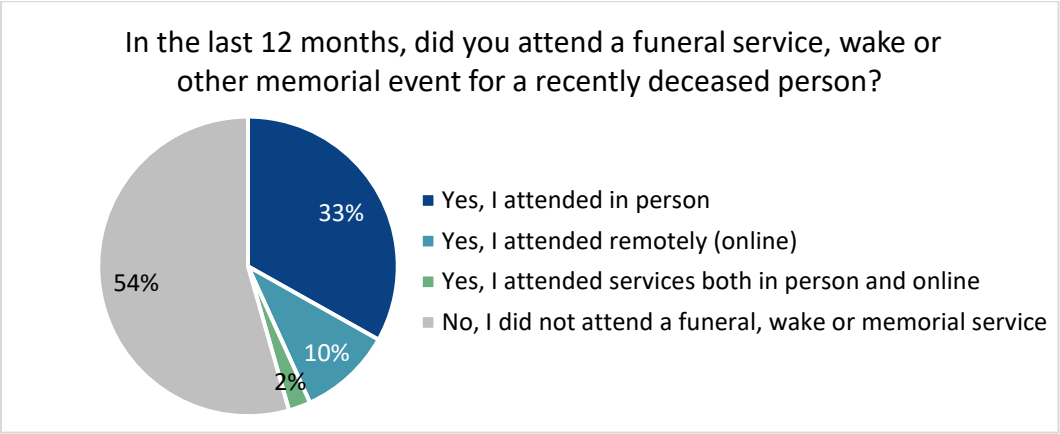


Most wished their burial site to be marked with a headstone (55%) or plaque (31%), while a few preferred it to be marked with a tree or other plant (11%) or with a statue or sculpture (8%). Only a handful of respondents preferred their burial site to have no visible marker (1%). Burial site marker preferences were not clearly differentiated by age or other demographic factors.

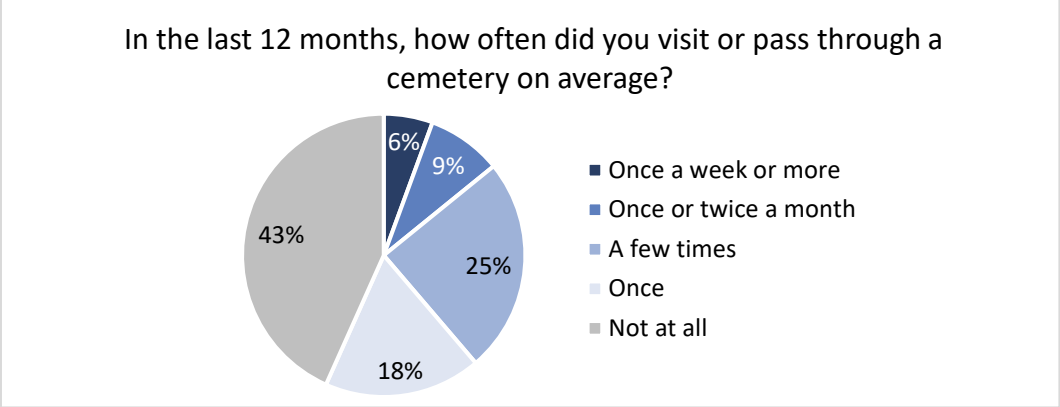


Attendance at funerals and cemeteries

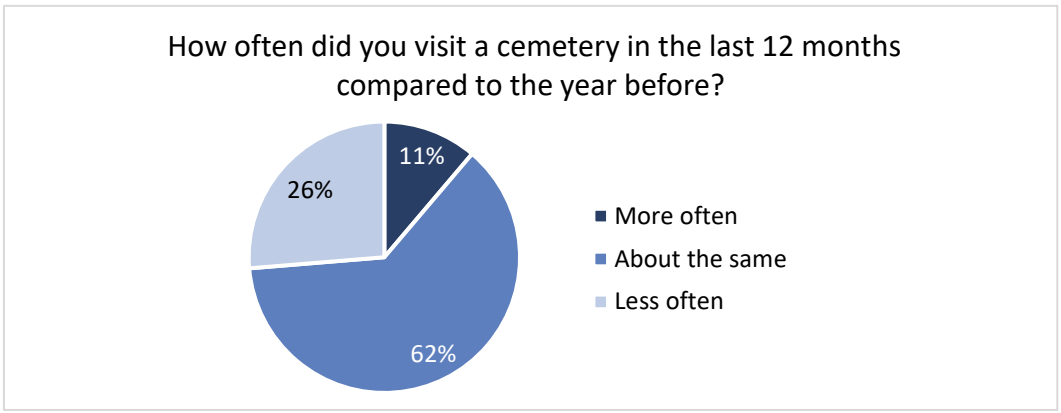
Almost half (46%) of respondents had attended a funeral in the previous 12 months. Among Catholics this was somewhat higher (53%). The number of respondents who had attended a funeral remotely via webcast in this period was around one in eight (12%), or around one in six of those with a university degree (16%). Respondents from the older age group had attended funerals remotely at similar rates to those from the middle and younger age group, but they were substantially less likely to have attended in person. Only 24% of the older age group had attended a funeral in person, compared to 39% of the younger age group and 37% of the middle age group. This may be attributable to the higher risks that older people have faced during the COVID-19 pandemic, although we do not have comparable data from previous years to be sure.



More than half (57%) of respondents had visited or passed through a cemetery in the previous 12 months. Catholics were more likely than non-Catholics to have visited a cemetery at least once (66% vs 55%). Respondents in the younger age group were more likely than those in the older age group to have visited a cemetery at least once (70% vs 41%), and to have visited a cemetery on a monthly basis (14% vs 4%) or a weekly basis (10% vs 3%).

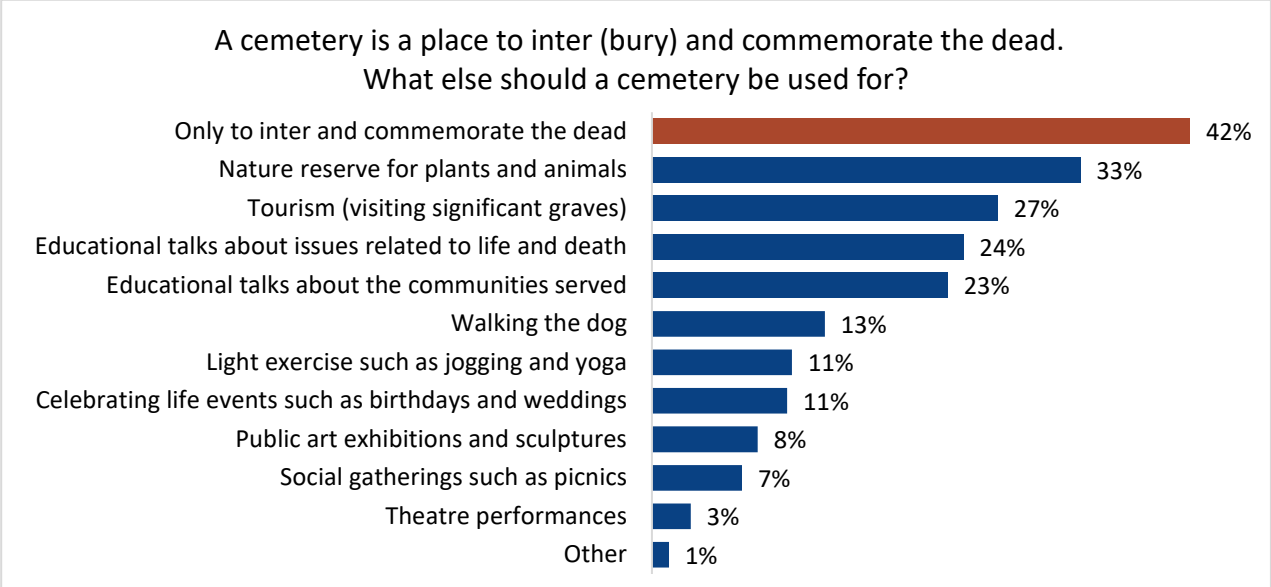


To test how the COVID-19 pandemic affected cemetery visitation, the survey asked respondents how often they had visited cemeteries in the last 12 months (during the pandemic in Australia) compared to the preceding 12 months (prior to the first substantial wave of the pandemic in Australia). Around a quarter (26%) had visited less often, while around one in ten (11%) had visited more often. Among the younger age group, 18% had increased their cemetery visits. Respondents in the older age group were more likely than respondents in the younger age group to say that their cemetery visits had stayed about the same (72% vs 53%), and somewhat less likely to say their cemetery visits had reduced (22% vs 29%). This suggests the lower rate of cemetery visitation reported by the older age group in this survey is broadly indicative of a normal year, rather than being primarily a result of the age-related risk profile of COVID-19.



Views on cemetery usage

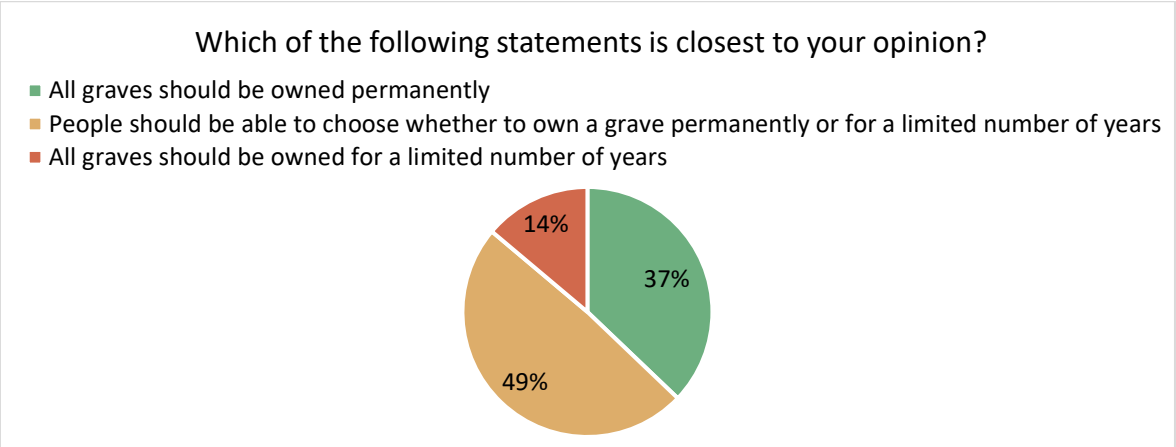
The survey described a range of services or activities that a cemetery could be used for in addition to interment and commemoration, and it asked respondents to indicate whether or not they approved of each one. The two most popular choices were "a nature reserve for plants and animals" (33%) and "tourism" (27%), and these two options were especially supported by the older age group (41% and 35% respectively). Educational talks were also relatively popular, whether the subject matter was philosophical issues related to life and death (24%) or the communities that the cemetery serves (23%). Exercise in the cemetery was generally not supported, with few favourable responses for "walking the dog" (13%) and "light exercise such as jogging and yoga" (11%). Social and communal gatherings were the least accepted activities, with low levels of support for "celebrating life events such as birthdays and weddings" (11%), "public art exhibitions and sculptures" (8%), "social gatherings such as picnics" (7%) and "theatre performances" (3%). There was also an option to reject all such activities by ticking the option that read: "A cemetery should only be used to inter and commemorate the dead", and this was chosen by 42% of respondents. Those with a university degree were significantly less likely to select this option (33%), and significantly more likely to support all the alternative cemetery activities other than celebrating life events, social gatherings and theatre performances. Similarly, fewer men (39%) than women (45%) rejected alternative cemetery activities outright, and men were significantly more likely to support all the alternative cemetery activities other than nature reserve, celebrating life events, tourism and educational talks about philosophy.



A potentially controversial issue in cemetery management is limited-tenure grave ownership. The survey introduced the issue with the following brief explanation:

> In some places around the world, graves are owned for a limited time, typically 25 or 50 years. Afterwards, the grave can be reused for another burial. This reduces the cost of new burials and helps to ensure that burial space remains available in the places where most people live.

Respondents were then asked to choose between three positions on grave tenure: "All graves should be owned permanently" (mandatory perpetual tenure), "All graves should be owned for a limited number of years" (mandatory limited tenure), or "People should be able to choose whether to own a grave permanently or for a limited number of years" (choice). Just under half of respondents supported giving people a choice (49%). Mandatory perpetual tenure (37%) had more than twice as much support as mandatory limited tenure (14%). Support for mandatory limited tenure was significantly higher among men (19%), the older age group (18%) and the non-religious (17%). Women were more likely to say that people should have a choice (53%). Although current legislation on grave tenure differs between the states and territories of Australia, we did not find any statistically significant variations in attitudes to grave tenure between residents of different states and territories.



Attitudes to memorial and cemetery technologies

The survey asked respondents to rate how they felt about thirteen hypothetical technologies. Table 2 shows the descriptions that were given for each technology, along with a short label for ease of reference in this report.

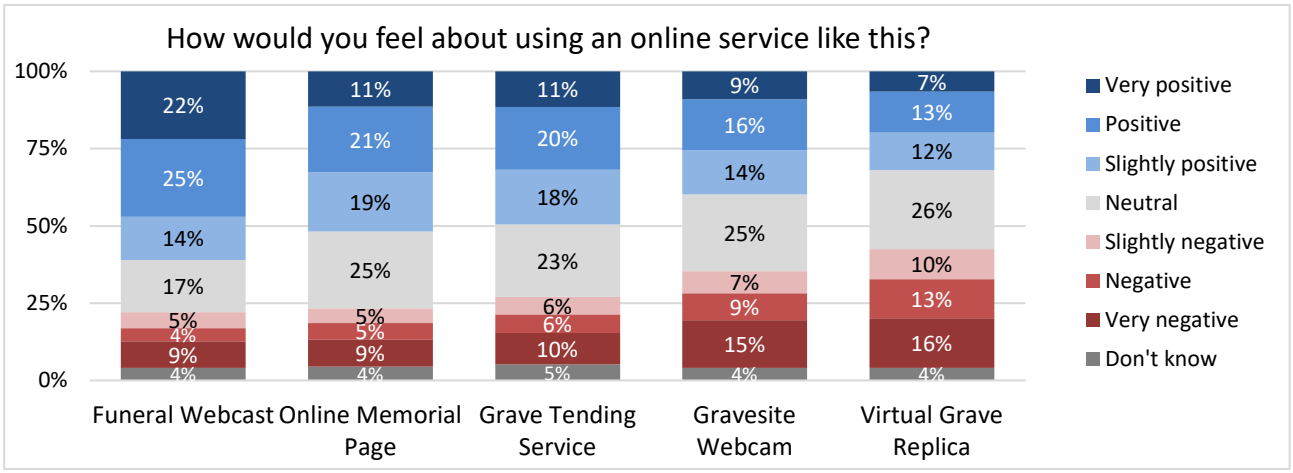
Table 2 Technologies described in the survey. Respondents were shown the descriptions only, not the labels.

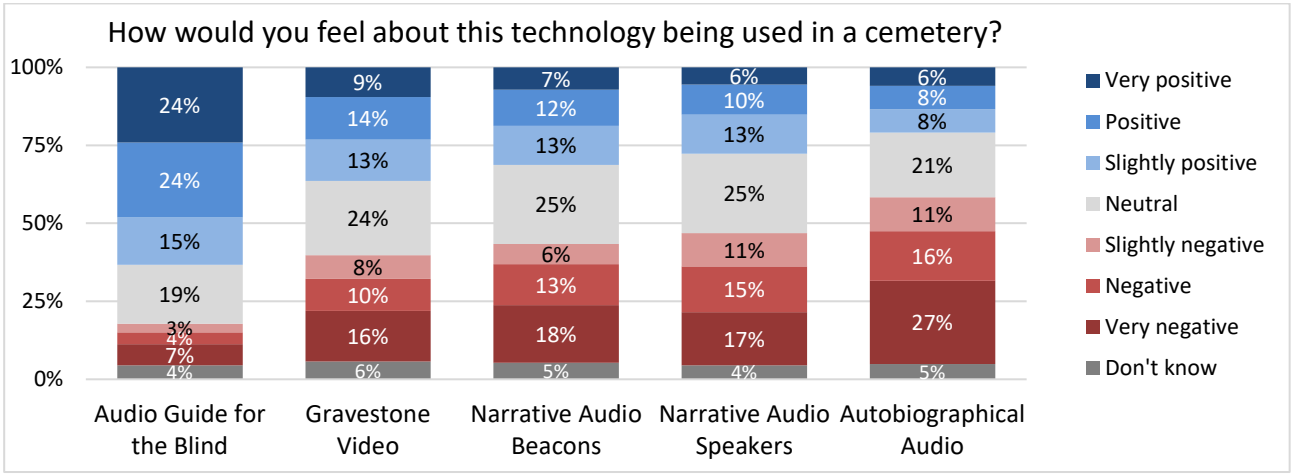
Label	Description
Funeral Webcast	A live streaming video of your loved one's funeral, to allow you to attend the funeral remotely by watching it on a computer, mobile device or television.
Online Memorial Page	A memorial webpage with photographs, videos, music and written tributes to your loved one. You can leave messages and tributes such as virtual flowers, and see the messages and tributes left by other people.
Gravesite Webcam	A live video of your loved one's gravesite that you can view on a computer, mobile device or television. The video is streamed over the internet from cameras installed at the cemetery, so that you can see and hear your loved one's grave at any time. You can choose between a close-up view or a wider view of the gravesite and the surrounding area.
Grave Tending Service	A professional service that you can hire for a small fee to visit your loved one's grave and perform maintenance: clean the headstone, trim the plants, and leave flowers or other offerings. When the work is complete, you receive photographs of the gravesite.
Virtual Grave Replica	A 3D photographic replica of your loved one's grave, which you can view on a computer, mobile device or virtual reality (VR) device. You can place messages, virtual flowers and other offerings on the grave, and see what other people have left there before you. You can press a button to hear atmospheric sounds recorded at the cemetery, such as birdsong.
Audio Guide for the Blind	A mobile app designed to help blind or visually impaired people to navigate the cemetery. The app provides audio information as the user moves about the cemetery, for example by reading aloud the inscriptions on nearby headstones. It also includes a self-guided walking tour function, which provides audio instructions for how to reach various points of historical, cultural or botanical interest.
Narrative Audio Speakers	Speakers installed at several prominent locations around the cemetery. When activated, the speakers play spoken stories about the cemetery and some of the people buried in each section. The stories play at a moderate volume, so that they are clearly audible to anyone within about 10 metres of the speaker.
Narrative Audio Beacons	A small device installed on a gravestone that can send a spoken story about the deceased to your phone when you activate it. The story may be spoken by the deceased person, a member of their family, or a historian if the person died a long time ago.
Autobiographical Audio	A mobile app that plays an audio clip of the deceased person speaking when you approach their grave. In some clips the person is telling an autobiographical story about their life, while other clips are recorded from events in their life such as a wedding speech. The audio gets louder as you approach their grave, as though you are eavesdropping on them talking at their gravesite.
Gravestone Video	A gravestone with a built-in display screen, which shows a video tribute to the deceased person when activated. The video may be silent or it may have sound. The contents of the video would be decided in advance by the deceased person or after death by their family.
Augmented Reality Avatar	Augmented reality glasses that show an interactive hologram of a deceased person when you look at their grave. A small QR code affixed to the grave activates the glasses. The hologram appears superimposed on the grave, and is animated with natural body motions. Through artificial intelligence, you can ask the hologram simple questions and hear it respond in the deceased person's voice.
Location-based Historical Game	A mobile app that allows you to play a location-based game in the cemetery, with a historical mystery theme. To play the game, you walk around the cemetery visiting notable graves or monuments to make significant people from history appear on your phone. By asking these virtual people questions about their lives, you collect clues to solve a historical mystery.
Location-based Ghost Game	A mobile app that allows you to play a location-based game in the cemetery, with a ghost hunting theme. To play the game, you walk around the cemetery visiting notable graves or monuments to make virtual ghouls and ghosts appear on your phone. The goal is to catch each creature by defeating it in a challenge.

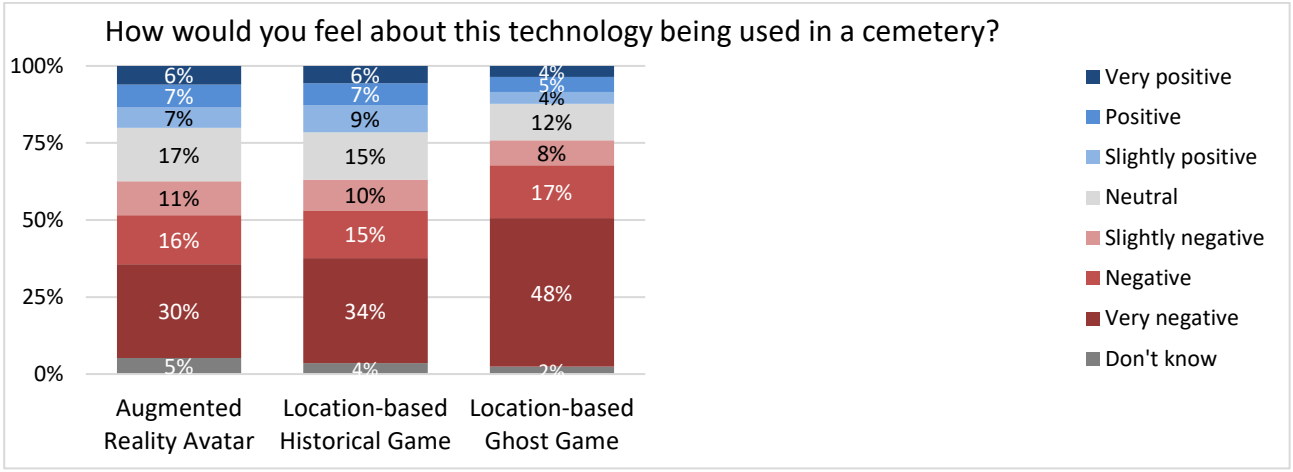
All thirteen technologies were based on real technologies that have been documented in previous research.[3] The first five were web-based technologies designed to support memorialisation practices outside the cemetery. For

[3] The DeathTech Research Team has compiled a global index and map of digital technologies for cemeteries, entitled the Encyclopedia of Cemetery Technology, at: https://cemeterytech.omeka.net/

these, the survey asked: “How would you feel about using an online service like this?” The remaining eight were technologies designed to enhance the experience of visiting the cemetery with interactive media. For these, the survey asked: “How would you feel about this technology being used in a cemetery?” Respondents gave their responses on a seven-point scale ranging from “very negative” to “very positive”. Following each rating, the survey provided an open text box for respondents to explain why they gave that response.







The quantitative responses to the technologies are summarised in the charts above. Where the text refers to positive ratings in general, this includes any of the positive response options: “very positive”, “positive” or “slightly positive” (shaded blue). Conversely, where the text refers to negative ratings in general, this includes any of the three negative response options: “very negative”, “negative” or “slightly negative” (shaded red). The midpoint response option was “neutral”. There was also an option to choose “don’t know”—selected by no more than 6% of respondents for any of the technologies.

There was a steep gradient in the levels of support for the technologies. Four received positive ratings from at least half of the respondents: *Audio Guide for the Blind* (63% positive), *Funeral Webcast* (61% positive), *Online Memorial Page* (52% positive) and *Grave Tending Service* (50%). Conversely, four received negative ratings from at least half of the respondents: *Location-based Ghost Game* (74%), *Location-based Historical Game* (60%), *Augmented Reality Avatar* (57%) and *Autobiographical Audio* (53%). The remaining five technologies had broadly similar numbers of positive and negative ratings.

With one exception, the ratings for all technologies were negatively correlated with the respondent's age. *Funeral Webcast* was the exception, as it uniquely attracted similar ratings across all three age groups. For every other technology, respondents in the younger age group were significantly more likely to give a "very positive" or "positive" rating, and respondents in the older age group were significantly more likely to give a "very negative" rating. The middle age group provided more negative ratings than the younger age group but more positive ratings than the older age group, for all technologies other than *Funeral Webcast*.

The consistency and positivity of responses towards *Funeral Webcast* may reflect the fact that it offers a service (videoconferencing) that is fundamentally already familiar to people and relevant to their everyday lives—especially since the onset of the COVID-19 pandemic, during which video calls have been an important conduit for personal and familial relationships. The need for videoconferencing at funerals, in particular, has also been made clear by how pandemic control measures have restricted in-person funeral attendance. The other technologies presented in the survey represent more of a break from what is familiar to most people.

There was a gender difference in the responses to many of the technologies, particularly in regard to strongly negative responses. Significantly more men than women stated that they felt "very negative" about eight of the technologies: *Funeral Webcast, Online Memorial Page, Grave Tending Service*, *Gravesite Webcam, Virtual Grave Replica, Audio Guide for the Blind, Gravestone Video* and *Narrative Audio Beacons*. Conversely, men were somewhat more positive than women towards *Augmented Reality Avatar* and *Autobiographical Audio*.

In general, respondents were less favourable towards technologies designed for use in the cemetery than technologies designed for use outside the cemetery. This suggests that negativity towards cemetery technologies is at least partly based on an expectation that digital technology will disrupt the reflective atmosphere of a cemetery, rather than a more general resistance to digital technology in mourning and commemoration. *Audio Guide for the Blind* was the only cemetery-based technology to receive substantially more positive ratings (63%) than negative ratings (13%), reflecting an appreciation that it would serve a clear social need while being an unobtrusive presence in the cemetery. The next best cemetery-based technology was *Gravestone Video*, which received an even balance of positive (36%) and negative (34%) ratings. It is interesting that it did so despite being a more visually and aurally conspicuous technology than many of those ranked below it, such as *Narrative Audio Beacons* (31% positive, 38% negative), *Autobiographical Audio* (21% positive, 53% negative) and *Augmented Reality Avatar* (20% positive, 57% negative). Even so, *Gravestone Video* received only marginally better ratings than the most poorly rated remote technology, *Virtual 3D Grave* (32% positive, 38% negative). As an overall trend, respondents were relatively accepting of technologies that were seen to be sensitive to the space and the traditional purpose of the cemetery for commemorative practices, and relatively critical of technologies that were seen to introduce unrelated practices or intentions into that space, such as gaming.

Conclusion

The Future Cemetery Survey 2021 provides a snapshot of Australians' views on final disposition, cemetery use and memorial technology at an extraordinary time, during a pandemic that has made deathcare and funeral practices a more prominent part of public discourse than they have been for generations. The results of the survey show that Australians lean towards a pragmatic, low-fuss form of final disposition, with cremation followed by scattering being the dominant preference for how their bodies should be treated. The effects of the COVID-19 lockdowns are clear in the fact that one in eight Australians had attended a funeral via webcast in the previous 12 months, and funeral webcasts have become a widely accepted technology. Other such technologies for helping people to commemorate the dead from their home have moderate levels of public support, but the survey shows that many Australians are currently resistant to the idea of digital technologies in cemeteries unless they have a clear justification. Younger Australians are more open to memorial technologies, however, so opposition to digital cemetery technologies may soften over time.

The DeathTech Research Team is based at the University of Melbourne and the University of Oxford. Its current members (in alphabetical order) are:

- Dr Fraser Allison
- Prof. Michael Arnold
- Prof. Martin Gibbs
- Dr Hannah Gould
- Assoc. Prof. Elizabeth Hallam
- Mr Samuel Holleran
- Prof. Tamara Kohn
- Dr Bjørn Nansen

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For project updates and further information, visit https://deathtech.research.unimelb.edu.au/
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