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# Design meets Death: A first systematic mapping review of design contributions to end of life field

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**Abstract:** This paper, for the first time, maps and interrogates the contributions towards the emerging field of design and death, through a systematic mapping review. Key databases and grey literature publications are searched and 183 design contributions are analysed, categorising results according to death spectrum; type of contribution; interventional complexity; design approach; and stakeholder involvement. Findings show an increasing trend of design contributions towards death between 2000-2021. The field is being progressed by a triad of Healthcare, Computer Science and Design disciplines, often siloed in their efforts. Design approaches and methods including Human-Centred design and Co-design are popular, particularly within Healthcare. Majority of design interventions are object-based and focused towards final disposition, with a lack of 3rd and 4th order designs i.e. service, interaction and systems. Strategic implications include transitioning through transdisciplinarity; interconnectivity across the death spectrum; expansion of design theories in the field; and interventions beyond the object.

**Keywords:** death; palliative and end of life care; design contributions; systematic review

## 1. Introduction

Designing for death and dying is a complex and emerging area gaining visibility, momentum, and wide interdisciplinary interest (Pallister, 2015; End Well, 2017; HELIX, 2017). Design contributions so far, however, have been minimal and disjointed, lacking in critical knowledge base and strategic vision (Nickpour, 2019).

The Covid-19 pandemic has pushed the UK palliative care system to a level of demand not predicted to be needed until 2040 (Griffin, 2021). Design driven innovation could play a key role here, responding with enhanced and alternative health and care solutions towards the end-of-life (Verganti, 2009).

There have been wide resounding calls to reclaim and reimagine death and end of life as 'human', rather than merely 'medical' (Davies, 2018). Arguments around personalised medicine (Lloyd-Williams et.al, 2008), patient-centred care (Kane et. al, 2015), patient-



reported outcomes (Aslakson RA, et. al, 2017), and human-centred design (Giacomin, 2015) contribute towards moving to ‘humanise’ death. Such approaches however, require a wider transdisciplinary discourse, outlook, and collaboration involving design and death (Nickpour, 2019). In other areas of death, the handling of digital data and media services after a user has died is being explored (Brubaker & Callison-Burch, 2016) along with experimentations and categorisation of hybrid memorials (Odom et al., 2018; Moncur and Kirk, 2014), and making death an integral part of the design of a system or service with Thanatosensitive Design (Massimi, 2009).

While design contributions to the field are growing in multiple divergent areas, the full breadth and attributes of these contributions, and the wider landscape of design and death as an emerging field is currently completely unknown, lacking holistic and rigorous studies. This is significant and critical in order to inform future contributions and steer strategic research and practice directions for this potentially significant field.

## 2. Objectives and research questions

To ensure key attributes of design contributions to death were thoroughly and rigorously captured. Three major themes of; A. Design topics & timing (Where and When), B. Design contributions & outcomes (What), and C. Design approaches and stakeholders (How and Who) were outlined. These were further detailed in terms of six key objectives and subsequent Research Questions (RQs) in Table 1. Modified categorisation from Wobbrock & Kientz (2016) and Buchanan (2001), along with a unique Death Spectrum were used to inform RQs 1, 3 and 4. Such thorough capturing of key attributes would then allow for examining overall trends, gaps and opportunities within the field.

Table 1. Research Objectives and Questions.

Objectives	Research Questions (RQs)
Investigate where (across the death spectrum) design contributions have been made	What areas of death are contributed towards? (Death Spectrum)
Investigate the chronological order of design contributions	When are the design contributions made? (Year)
Investigate the type of design contributions	What are the design contributions? (TMEI)
Investigate the complexity of design interventions	What are the interventional design outcomes? (Four orders)
Investigate the design approaches applied (principles, processes and methods)	What design approaches are applied? (principles, processes and methods)

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Investigate the stakeholders targeted and involved (target audience, research participants and disciplinary partners)	Who are the stakeholders involved? (target audience, research participants and disciplines)
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### 3. Strategy & Methods

To ensure the full breadth of design contributions to death were captured and to provide a thorough and holistic landscape of the field, a systematic mapping review (Grant & Booth, 2009) was adopted as the main research strategy. Systematic mapping reviews are useful in describing the state of knowledge for a broad topic. Systematic mapping reviews typically result in evidence of trends, clusters and knowledge gaps providing implications for policy, practice and research (James et al., 2016).

#### 3.1 Search Terms

After preliminary searches using the database SCOPUS, the term “design” was considered too ubiquitous in academic papers - having a plethora of uses unrelated to the field of design - which itself is subjectively defined. Combinations of terms related to death and design could also result in many irrelevant topics. (e.g. “end of life design” can relate to the end of a product’s life cycle). Several other design-related issues also informed the search process and protocol:

- Design terms such as Human-Centred design are used fluidly and are non-standardised, so inherently difficult to systematically search for (Bazzano et al., 2017).
- Design is not purely an academic pursuit that produces papers as contributions, nor does it have to publish its approaches in creating contributions and therefore loss in searching is inevitable.

A combination of search term categories were defined to ensure thorough results; **Design Approaches**, **Design Orientated Fields**, and **Death Terminology**. How those terms were conceived are as follows:

- **Design Approaches** (methods, methodologies, principles and approaches) has in part come from personal knowledge, a grey literature search of design methods, methodology, principles and approaches, and the work of Chamberlain et al. (2015)
- **Design Oriented Field** relates to the field of design and design adjacent subjects such as HCI and Robotics.
- **Death Terminology** are common words associated with death and dying, verified by a third-party expert.

The search terms populating each category can be found in Table 2.

Table 2. Search Term Categories

<b>Design Approaches</b>	<b>Design Oriented Fields</b>	<b>Death Terminology</b>
Brainstorm*	Design*	Bereave*
Co-design	Human Computer Interaction	Burial
Co-production	Technolog*	Cemetery
Co-research	Robot*	Coffin
Collaborative design		Death
Creative Practice		Thanato*
Critical Design		Dying
Design Probe		End-of-life
Design Thinking		Final disposition
Evidence-based design		Funera*
-centred design		Grave
-centred design		Grief*
Inclusive design		Hospice
Iterative design		Memorial*
Journey map		Mortal*
Participatory design		Mourn*
Speculative design		Palliative
Storyboard*		Telepalliative
Universal Design		Terminal illness
User Journey		Transitional Care
Wirefram*		Terminal disease

### 3.2 Search Strategy

Search term categories found in Table 2. would be used in combinations appropriate to what was being searched; Databases, ACM Digital Library or design-focused Journals and Publications. These each required different search strategies to ensure the results were thorough, appropriate and manageable:

**Databases** were selected based upon the prominent related journals they contained outlined in Table 3. Search strategy for these databases included all three search term categories and the search was limited to Title, Abstract, and Keywords. However, this will exclude design contributions that have not used design methodologies or have no mention of the search terms in the title, abstract or keywords.

In an attempt to capture potentially missed design contributions we searched in **Design-focused Journals and Publications** which included: *The Design Journal* and *Design Issues*. This was also applied to Grey Literature search using popular design websites, (Dezeen, Designboom, Creativeboom, Design Week, Dexigner, Wallpaper\* ) The strategy for these journals and publications would exclusively use Death Terminology since design is already implicit in their remit.

Our final strategy was unique to **ACM Digital Library**, which we do not categorise as exclusively a design orientated database nor as having journals that are exclusively design orientated. The library however contains critical work by researchers of a non-design background using non-design methodologies to explicitly contribute to design within the scope of this paper. Therefore, our strategy limited our search to include Design Orientated Fields and Death Terminology exclusively.

The search strategy using our defined search term categories is illustrated in Figure 1. below.

*Table 3. Prominent journals and publications with their associated database*

<b>Journal/publication</b>	<b>Database</b>
Journal of Palliative Medicine	SCOPUS
Death Studies	Taylor and Francis Online
Design Issues	JSTOR
Ergonomics in Design: The Quarterly of Human Factors Applications	SAGE Journals
HERD - Health Environments Research & Design	SAGE Journals
Information, Communication & Society	Taylor and Francis Online
Journal for the Study of Spirituality	Taylor and Francis Online

Journal of Aging & Social Policy	Taylor and Francis Online
Journal of Pain and Symptom Management	National Medicine Library (PubMed)
Mortality	Taylor and Francis Online
OMEGA - Journal of Death and Dying	SAGE Journals
The Design Journal	Taylor and Francis Online

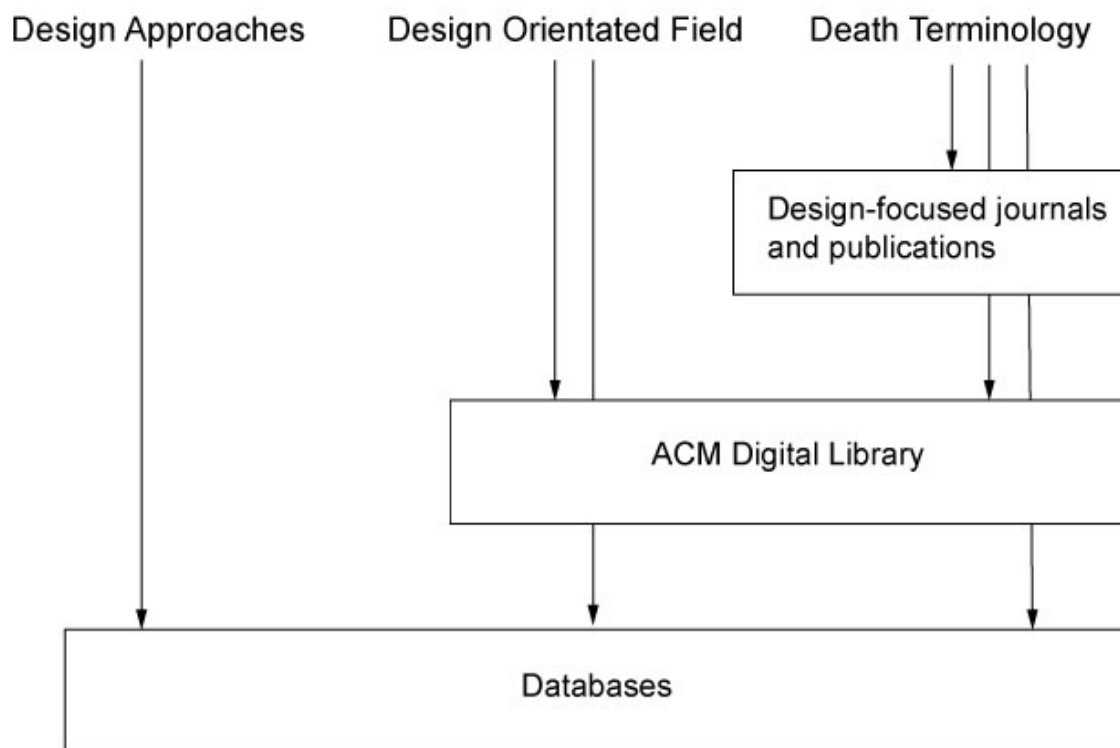


Figure 1. Search strategy with search term categories and their application

### 3.3 Inclusion/Exclusion Criteria

The Inclusion and Exclusion Criteria (Table 4) aimed to capture the broadest number of results with a focus on areas of death and dying, and to avoid death preventative, rehabilitative or diagnostic studies.

Table 4. Inclusion and Exclusion Criteria

Inclusion	Exclusion
Design contributions that:	Design contributions that:

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Focus on the end-of-life, aspects of burial and final disposition, and grief, legacy and memorialisation.	Seek to identify a death through diagnosis
Authored by or consulted by design researchers/ professionals.	Attempt to prevent death or cessation of a potential life-threatening habit.
Authored by non-designers but who have explicitly stated either, the use of design methods or methodologies as part of the research, or the research leads to implications for design.	Focus on rehabilitation and survival
Have full text available	Do not have the full text available
Written in the English language	Are written in a non-English language

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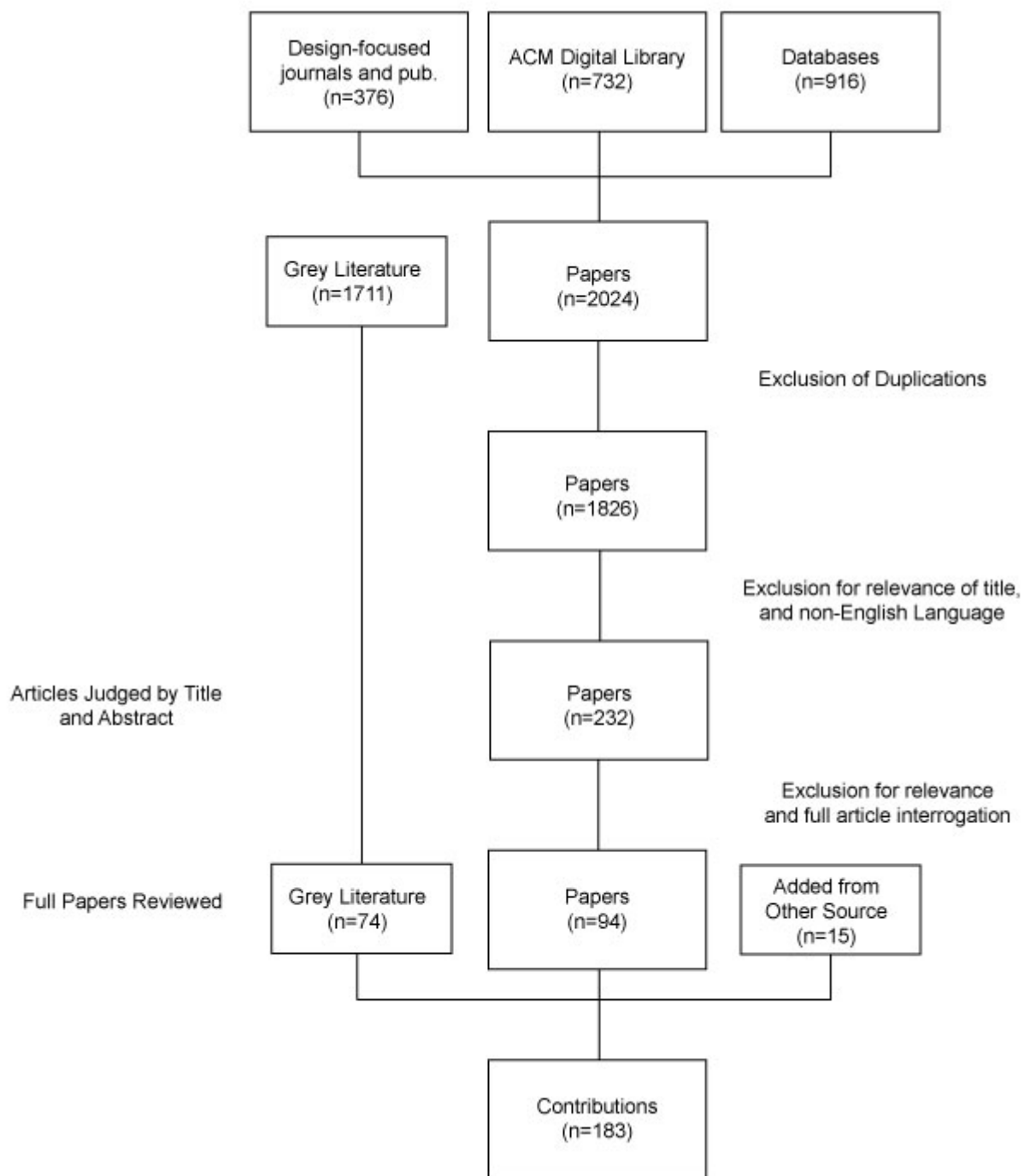


Figure 2. Inclusion and Exclusion Process

Figure 2 outlines the detailed Inclusion and Exclusion Process for search results. Results of the search were combined and duplicates were removed (n=198). A team of two researchers then screened the titles for relevance to the inclusion criteria and in the English language. Abstracts and full articles were interrogated to meet the inclusion criteria, and disputes and missed articles were discussed between researchers. This resulted in n=94 final papers included.

Searching within Grey Literature we discovered n=1711 contributions. These were screened by a single researcher for relevance, which resulted in n=74 contributions meeting inclusion criteria. A further n=15 articles were added from other sources. Totalling all relevant and included contributions at n=183 to be analysed further.

### **3.4 Data analysis**

#### **The Death Spectrum**

To provide a holistic overview of the extended scope of death and dying six high-level stages forming a Death Spectrum (Table 5) were defined. These include End of Life (EoL); Death; Final Disposition; Legacy; Memorialisation; and Grief.

While these stages have been identified for categorisation purposes, it is important to note that they are not entirely separated from each other. End of Life, Death, and Final Disposition are chronologically experienced. Legacy and Memorialisation is a perspective of authorship and time. Legacy is created in the past or present to be experienced in the future, Memorialisation is created in the present about the past. Grief associated with death and dying is overarching and is present at any time, by any individual in different forms.

*Table 5. The Death Spectrum*

<b>Area of Death</b>	<b>Definition</b>
End of Life (EoL)	An area that works around and with those who are on a health trajectory that is in an irreversible decline towards death. e.g. Hospice and Palliative Care
Death	An area that relates to the immediate time surrounding a death, e.g. deathbeds
Final Disposition	An area that deals with the immediately deceased. Preparation of a body, funerals and the rituals surrounding them, disposal methods; burial, cremation etc. disposal containers; coffins, urns etc.
Legacy	An area where an entity has actively created something to extend a presence into the future.
Memorialisation	An area where an entity has created something to represent either a person, place or event of the past.
Grief	An area that deals with the emotions of bereavement around death and dying and can be on either side of the time of death.

#### **Type of contribution**

Four categories of contributions i.e. Theoretical; Methodological; Empirical; and Interventional (I.1, I.2) (Wobbrock & Kient, 2016) were included. Table 6. presents the classification system for contributions adopted from Shaw & Nickpour (2021).

Table 6. Contribution Types (TMEI)

Classification	Definition
T - Theoretical	Conceptual models, frameworks, policies, principles or important variations on those that already exist.
M - Methodological	Stated methodologies, methods, processes, approaches used.
E - Empirical	Data sets, surveys, arguments or findings based on empirical research which reveal formerly unknown insight and analysis of behaviours, capabilities, or interactions with interventions, etc.
I - Interventional	New or improved products, services, systems or artefacts. I.1: Implemented or commercialised. I.2: Remained concept or prototype.

### Order of Intervention Output

Adopting Buchanan’s four orders of design (Buchanan, 2001), contributions were further categorised under four types presented in Table 7. In this paper, we assign the four orders to interventional contributions as outputs.

Table 7. Interventional Orders of Design

Order	Definition
1. Symbols (Graphic design, words, imagery and communication)	Design of symbolic and visual communications.
2. Things (Industrial design - objects)	Design of material objects.
3. Action (Interaction design - services, processes, user interaction design)	Design of activities and organised services. A singular interaction or process.
4. Thought	Design of complex systems or environments in which all of the lower orders are present.

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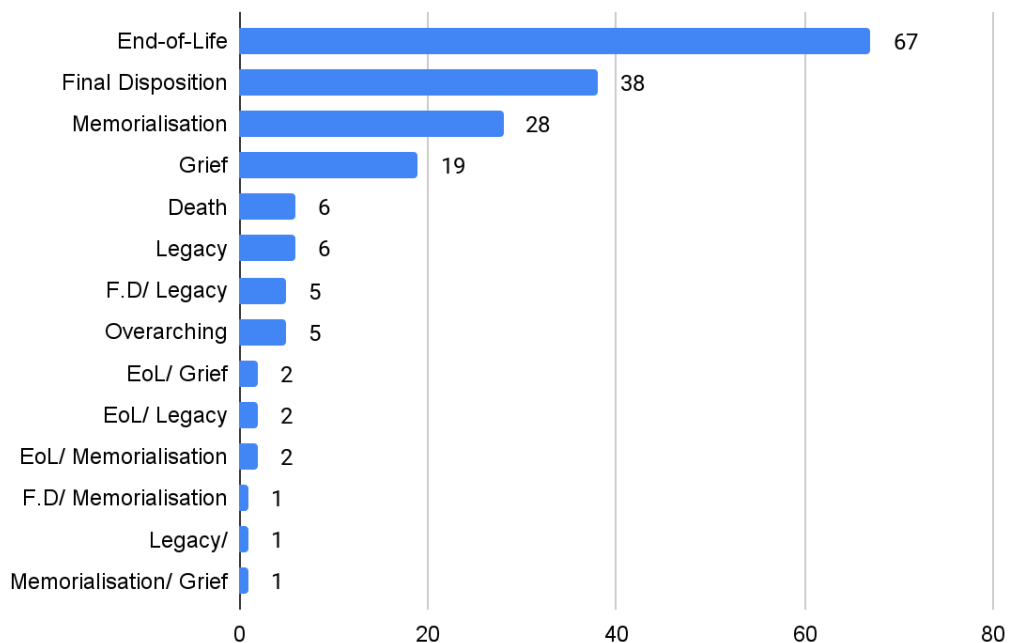
(Environmental design -  
systems, organisation)

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## 4. Findings

### 4.1 Contributions to the Area of Death

Figure 1 shows the n=183 contributions discovered from the literature categorised into Areas of Death. End-of-Life (n=68; 37%) yielded the largest proportion of contributions and Death (n=6; 3%) and Legacy (n=6; 3%) were the lowest from the predefined categories. The most collaborative area was EoL combining with Legacy, Memorialisation and Grief. Shown in Figure 3 below:



*Figure 3. Contribution count to the Death Spectrum*

During our search we found contributions that took a holistic approach to the area of death and contributed to many different categories so a separate area was defined; Overarching. We placed the minority categories Death and Legacy into adjacent categories, Death was combined with EoL and Legacy combined with Memorialisation. Leaving five categories defined to be examined further. Contributions that overlapped with another area were categorised into their primary focus area.

## 4.2 Design and Death by Year

In Figure 4 below, we see an increasing trend of contributions up to May 2021, which contributed more results (n=16) than the entirety of 2015 (n=10). The largest year to contribute was 2020 (n=27). In 2016 there was a significant increase of EoL design contributions which has continued since. 2000 was the earliest result that passed inclusion criteria.

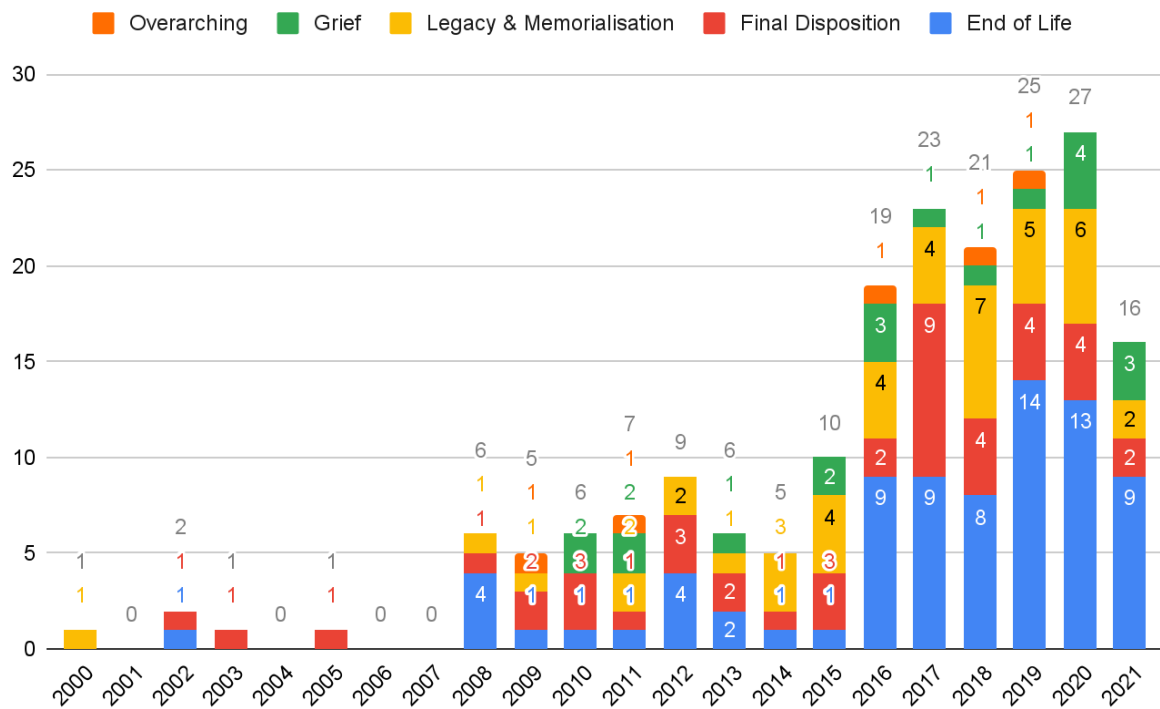
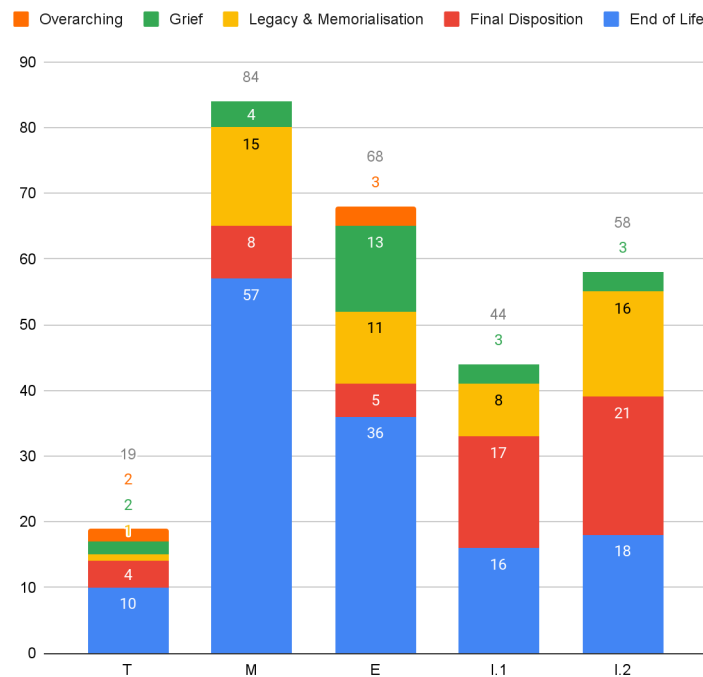


Figure 4. Contributions towards Death and Design by Year and Area of Death

## 4.3 Contribution by Type and Area of Death (TMEI)

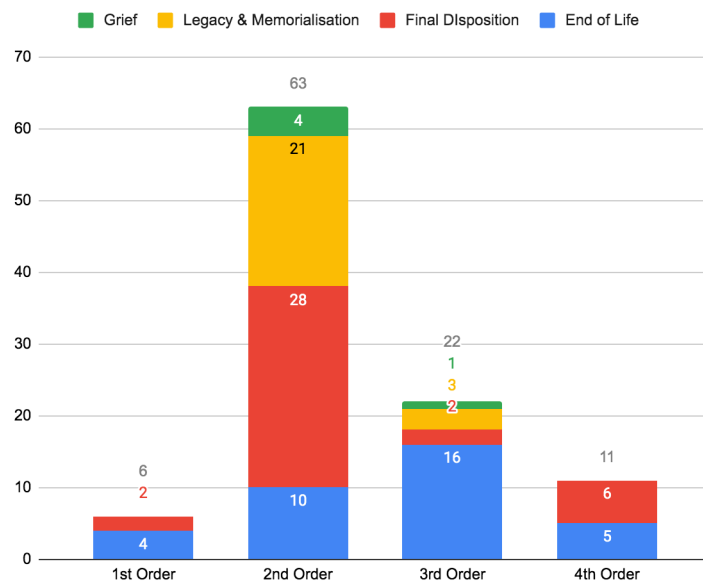
Figure 5 below shows that from n=183 design contributions we found n=273 types of contributions. We discovered that the majority of contributions were Interventional when I.1 (n= 44; 16%) and I.2 (n=58; 21%) are combined (n=102; 38% of total). Conceptual contributions make up the majority of design interventions. Within Interventional contributions Final Disposition (n=38; 37% of interventions) contributed the majority with EoL (n=35; 34% of interventions) second most. The largest single contribution was by EoL towards Methodological contributions (n=57; 21% of total).



*Figure 5. Contributions towards Type and Area of Death*

#### **4.4 Contribution by Interventional Output and Area of Death**

Figure 6 displays the n=102 interventional contributions discovered. The large majority of interventional design contributions were 2nd order (n=63; 62%), objects and things of material. Final Disposition made the single largest contribution to both the entire interventional space (n=38; 37%) and to the 2nd order (n=28; 44%).



*Figure 6. Contributions by Interventional Output*

#### 4.5 Design Approaches and Area of Death

A total of n=101 design methods, methodologies and approaches were recorded. EoL (n=66; 65% of total) was the majority contributor prominently using Co-design (n=20; 20%), Participatory design (n=12; 12%), Human-centred design (n=9; 9%), and User Centred design (n=8; 8%). Final Disposition contributed the second least amount of design methods and approaches (n=6; 6%) ahead of Overarching (n=2; 2%).

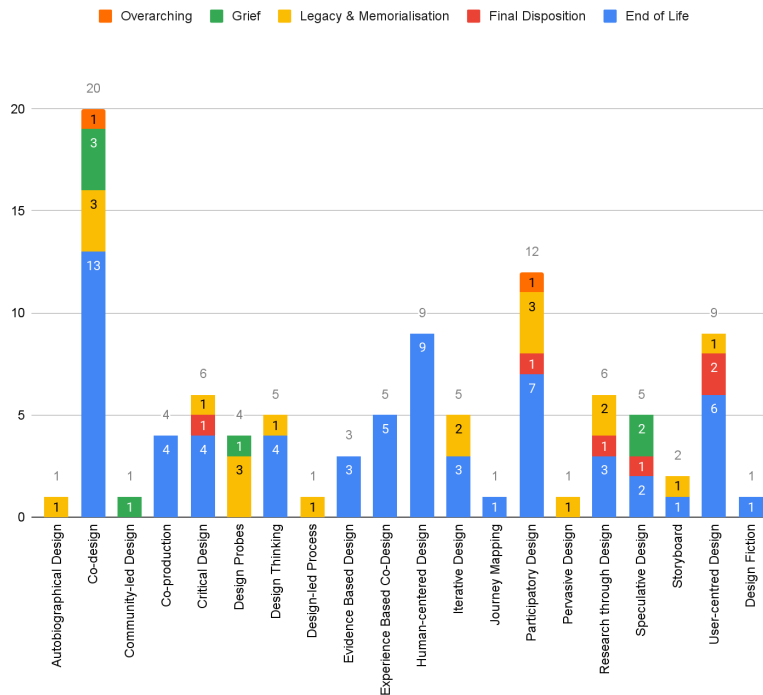
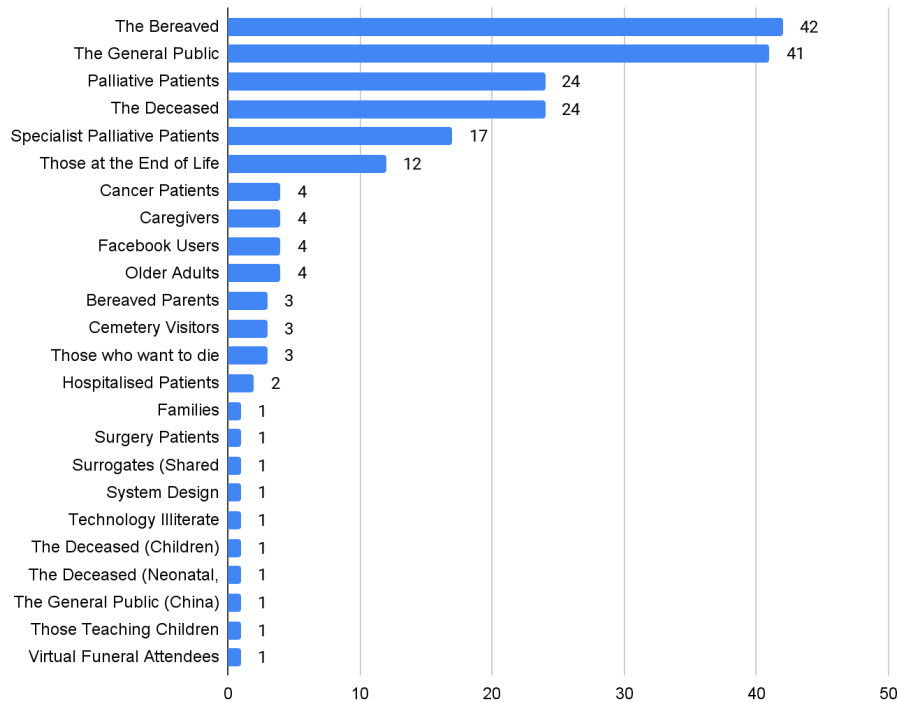


Figure 7. Contributions by Design Approaches and Area of Death

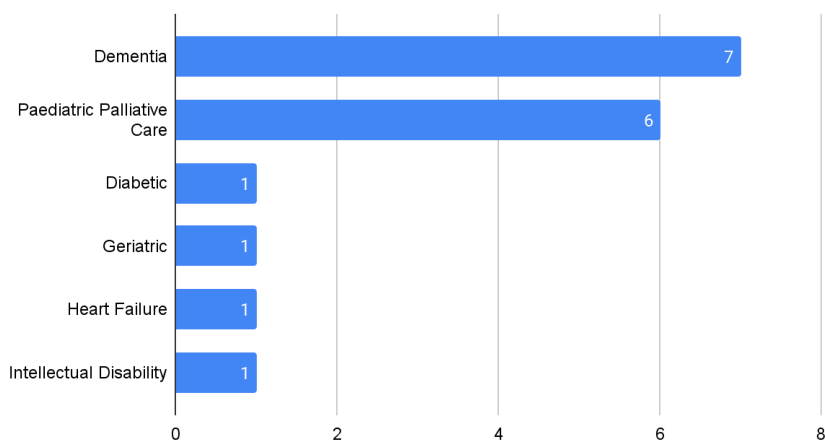
#### 4.6 Who are the stakeholders involved? (target audience, research participants and disciplines involved)

##### Target Audience

From the results, shown in Figure 8, we found design contributions were targeted at a specific audience in n=197 separate instances. The majority of the target audience is “The Bereaved” (n=42; 21%) - those who have experienced the death of someone close to them. The General Public (n=41; 21%), and the combined Palliative and Specialist Palliative Patients (n=41; 21%) were the second most targeted. Specialist Palliative Patients are broken down in Figure 9 where dementia (n=7; 41% of Specialist Palliative patients) and paediatric palliative care (n=6; 35% of Specialist Palliative Patients) hold the majority of contributions.



*Figure 8. Count of Target Audiences*



*Figure 9. Count Specialist Palliative Care Target Audiences*

“The Deceased”(n=24) as a target audience is related to something that is designed to be “used” by the deceased, often a coffin or an urn. Those at the end of life (n=12) are people not receiving palliative care but who are considered to be at the end of their lives e.g. emergency department patients.



## Research Participants

Figure 10. demonstrates who was involved within the research process as a participant (n=107). The largest section of research participants were Lived Experience Experts (n=27; 25%), defined here as people who have lived through the relevant experience, for instance those who have experienced a bereavement when designing for bereavement support.

There has also been a significant contribution where both Lived Experience Experts and Healthcare Professionals/Researchers have both been a part of the research process n=25 (23%).

The combined sections involving Lived Experience Experts account for (n=53) 50% of all research participants. The combined sections of Healthcare Professionals/Researchers were the second highest majority making up (n=35) 33% of involved stakeholders. Then we see a significant drop to Various Stakeholders (n=11; 10%) - which were either defined as “various stakeholders” or three or more distinct research participants - and Users (n=11; 10%), those who use a system, service or object.

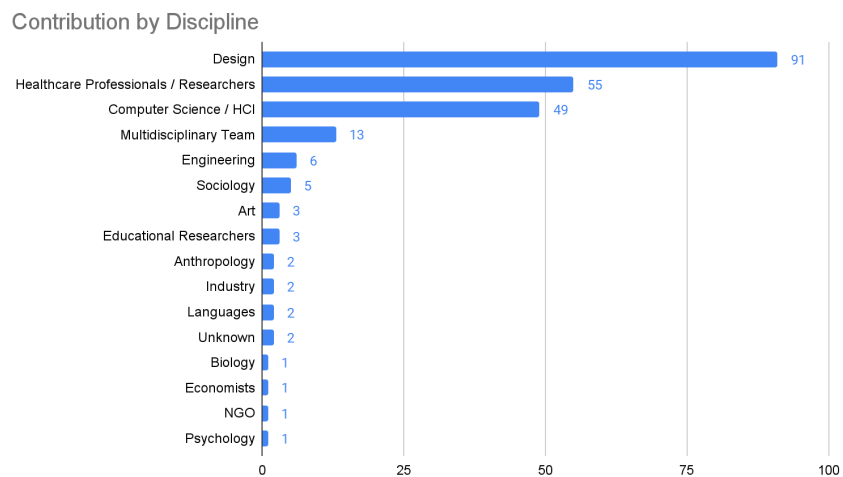


Figure 10. Count of Research Participants



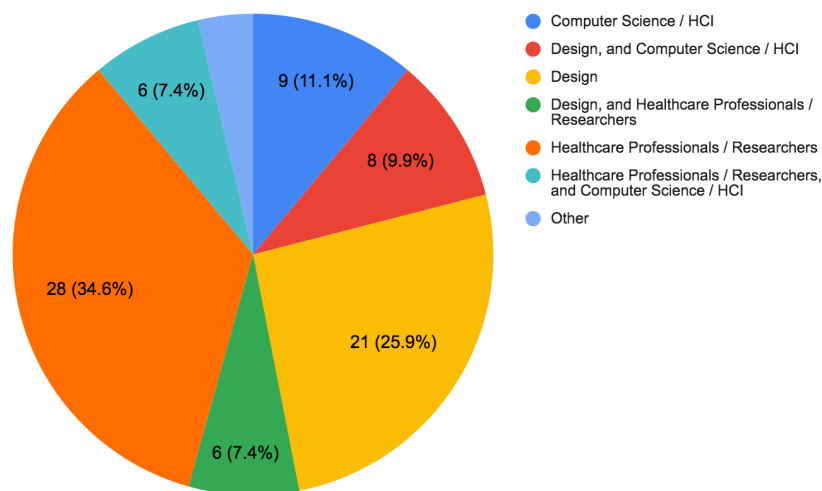
Figure 11. Count of Disciplines

## Disciplines

Figure 11. shows that out of n=233 counts of contributions by discipline, Design (n=91; 39%) has made the largest contribution followed by Healthcare Professionals/Researchers (n=55; 24%) and Computer Science/HCI. (n=49; 21%)

We discovered 81 instances of design methods, methodologies and approaches being used within 30 unique combinations of disciplines, with three main disciplines being most collaborative: Computer Science/HCI, Design, and Healthcare Professionals/Researchers.

Figure 12. displays instances of the three main disciplines and their collaborations with each other. We have, for clarity, absorbed instances of minority disciplines being in collaboration with one of the identified disciplines. E.g. Design and Economists is categorised under Design.



*Figure 12 Count of Identified Disciplines and their collaborations*

Healthcare Professionals/Researchers (n=28; 35%) were the largest single discipline to use design methods, methodologies and approaches, but Design as a collaborative contributor is the majority (n=35; 43%). The smallest section was Other (n=3; 4%), which is defined as a contribution with a design method, methodology or approach which did not have any of the other identified disciplines present.

## 5. Discussion

### *5.1 RQ1: What areas of death have been contributed towards (Death Spectrum)?*

EoL produced the majority of design contributions (n=68; 37%). This could be due to the significance of this stage as the focal point of the death spectrum, and in the large number of stakeholders involved during this time i.e. the dying individual, family, the healthcare staff, lawyers etc.

We find overlapping sections account for n=19 of the contributions (10% of total) demonstrating a strong connection between different areas of the death spectrum. Six EoL contributions were found to overlap with the areas Grief n=2, Legacy n=2, and Memorialisation n=2, accounting for 3% of total contributions.

### *5.2 RQ2: When have contributions been made towards death and design (Year)?*

We find a growing interest in design and death, with the average number of contributions between 2000-2007 being <1, 2008-2015 averaging 7 contributions, and 2016-2020 averaging 24 contributions. There is no evident explanation for the sharp increase in 2016, but it might reflect a wider change in attitude towards the use of design approaches in other fields.

With mortality salience rising (Evers et al., 2021) and issues surrounding end-of-life care during the COVID-19 pandemic in 2020 (Spacey et al., 2021), we hypothesise that it is unlikely that death and design contributions will stabilise or plummet.

### *5.3 RQ3: What are the design contributions? (TMEI)*

Interventional (n= 103; 38%) and Methodological (n=83; 30%) contributions account for more than two thirds of the overall design contributions. This may suggest that design has been predominantly approached as a means and an end, where its values lay in its problem-solving ability and the disciplinary transferable design tools and methods it has developed.

Theory is lacking contributions (n=18; 7%) with an even spread across each area of Death. This compared to an average of 93 methodological and interventional contributions, highlights opportunities for design to broaden and build upon existing theories surrounding death.

EoL created the majority (n=138; 51%) to Theoretical, Methodological, and Empirical contributions, and contributed a high proportion to Interventional (n=35; 34%).

### *5.4 RQ4: What are the interventional design outcomes?*

The overwhelming majority of interventional contributions are 2nd order, i.e. objects and things (n=63; 62%), of which 44% (n=28) are from Final Disposition, often coffins and urns. These results primarily reflect design's strong object orientation when it interacts with the

field of death. Despite this majority, we discover a distinct lack of 3rd order design contributions from Final Disposition; ignoring the context in which these objects will likely exist i.e. funeral services (n=3; 3%) means missing a prime opportunity for service design.

The lack of 1st order contributions could be due to graphic and communication design transitioning to digital interaction and therefore being categorised as 3rd order. Another reason could be that 1st order designs do not use design approaches or are less documented and therefore lost by our search criteria when published in a non-design journal.

Grief and Legacy & Memorialisation did not have a presence in 1st or 4th order interventional outcomes, demonstrating a gap in contributions for design to explore with interventional contributions.

### *5.5 RQ5: What design approaches are applied?*

Co-design (n=20) and Participatory design (n=12) were the two predominant methods used. These design methods are often used interchangeably but the inclusion of stakeholders in the research process is evidently popular, especially in EoL. EoL using co-design and participatory design methods account for 63% (n=20) of total contributions to these methods. This signals an interesting trend moving away from singular and expert-centric perspectives and approaches.

The next two most used approaches were Human-Centred design (n=9; 9%) and User-Centred design (n=8; 8%). Human-Centred design contributions have come exclusively from EoL, evidencing further intentions to 'humanise' the end of life experience.

Despite Final Disposition being the 2nd largest contributor to death and design (n=63; 62%), we only find six contributions using design methods. This is a significant finding demonstrating that the more object-oriented contributions from this area are more designer-centric and expressive in nature, assumingly less reliant on the application of design methodologies and methods.

EoL and Legacy & Memorialisation both evidence more varied use of methods, methodologies and approaches, demonstrating an experimental nature, a more methodological approach, and potentially a trust in design methods as a whole when researching these areas.

Design methods and methodologies are not solely solution-based. Applications of Research through Design, Critical/Speculative Design and Design Fiction (combined n=18; 18%) have been applied across an even distribution of the death areas. This shows that design methods are useful to engage research participants through the language and activities of design, to critically reflect upon the implications of design interventions, and to help engage with a multitude of sensitive and difficult topics around death and dying.

### *5.6 RQ6: Who are the stakeholders involved?*

The field of death and design has been progressed by a triad of key disciplines i.e. Healthcare, Computer Science and Design. This may encompass many of the currently salient aspects of a modern death, and more prominently the EoL; caring for the patient, caring for the humans, and managing our digital inheritances.

Half of those involved within the design process were Lived Experience Experts (n=53; 50%), further demonstrating that design contributions are well tuned to humanise the experiences surrounding death.

The Bereaved (n=42; 21%) hold the majority of the target audiences. many of the contributions towards this audience have been categorised as Legacy & Memorialisation, rather than Grief, as they did not primarily aim to support the audience emotionally through grief or mourning.

Designing for the general public as one target audience group demonstrates design's willingness and ability to engage a wide audience with sensitive, sometimes difficult and potentially taboo topics.

The majority of contributions by the Healthcare field (n=28; 82% of total Healthcare contributions with methods present) are without a designer as part of the team. With non-standardised definitions of design terms and methodological processes, there is room for misunderstandings and misuse, more importantly compromised and limited outcomes and impact, and eventually a loss of value and trust.

Despite these three disciplines working prominently with design approaches and collaborations between the fields, we do not find a contribution of all three collaborating applying a design approach.

## **6. Conclusion and implications for design**

This paper, for the first time, mapped and interrogated contributions towards the emerging field of design and death through a systematic mapping review. Key databases and grey literature publications were searched and 183 design contributions were analysed.

Contributions were categorised using standard, refined and novel methods, according to the death spectrum; year; type of contribution; interventional complexity; design approach; and stakeholder involvement.

Findings show an increasing trend of design contributions towards death between 2000-2021. The field is being progressed by a triad of Healthcare, Computer Science and Design disciplines, often siloed in their efforts. Design approaches and methods including Human Centred design and Co-design are popular, particularly within Healthcare. The majority of design interventions are object-based focused towards final disposition, with a lack of 3rd and 4th order designs i.e. service, interaction and systems.

Strategic implications include transitioning through transdisciplinarity; interconnectivity across the death spectrum; expansion of design theories in the field; and interventions beyond the object. This research sets a precedent in navigating strategic contributions and initiating critical conversations between the two fields of design and death.

### 6.1 Design conclusions

Table 8 further outlines the key conclusions according to each category and in relation to RQs.

*Table 8. Key Conclusions according to categories/RQs*

<b>Category/RQ</b>	<b>Key Conclusions</b>
1. Death Spectrum	The area of death categorised as End of Life had the largest contributions (n=68; 37%), and the most connections with other areas of death totalling n=6 (3%) overlapping contributions, demonstrating interconnectivity between areas of death.
2. Chronology of contribution	We find a growing interest in design and death, the average number of contributions between 2000-2007 being <1; 2008-2015 being 7; and 2016-2020 being 24.
d3. Type of contribution	Design contributions are majoritively Interventional and mostly conceptual (n=59; 22%). This could be due to the design contributions being expressive pieces, never intended for production. Methodological contributions were the second highest majority (n=83; 30%) demonstrating that design methods are popular within and outside the field of design. Theory contributions are lacking (n=18; 7%), highlighting opportunity for design.
4. Order of outcome	The overwhelming majority of interventional contributions by design are of the 2nd order; objects and things (n=63; 62%) of which 46% (n=29) are coffin or urn themed, but lack the context in which they exist. 3rd order; Funeral Service (n=3; 3%)
5. Design approach	Co-design and Participatory design were the two largest methods used with 20 uses of Co-design and 12 uses of Participatory design discovered; primarily used in EoL.
6. Stakeholder involvement	Death and design is primarily being progressed by three disciplines, Healthcare, Computer Science and Design. The overwhelming majority of those involved within the design process were Lived Experience Experts (n=53; 50%) The Bereaved, The General Public and the Combined Palliative and Specialised Palliative Patient hold the highest number of contribution with them as the target audience (n=42;41;41)

## 6.2 Implications for Design

Critically reflecting on the key findings from this first systematic review of design contributions to death, Table 9 outlines design research and practice implications and strategic opportunities for design contributions for the fields of death, dying, palliative and end of life care, going forward.

Table 9. Implications for Design

RQ	From	To
RQ1 WHERE  SPECTRUM OF DEATH	Siloed death areas  Areas of death and design have primarily focused on three specific areas with little crossover. The largest contributed area is also the area with the most crossover.	Granular and interconnected spectrum of experiences  Greater granularity in design contributions towards the death spectrum and progression and acknowledgements of interconnectivity between areas of death.
RQ3 WHAT  TYPES OF CONTRIBUTION	Interventional Contributions  Majority of design contributions are currently interventional, typical of a design problem solving approach	Design Theories of Death  New theories of death and design creating a wider foundation from which to build up from and aid in design problem framing.
RQ4 WHAT  COMPLEXITY OF OUTCOME	Prominence of 2nd Order  The majority of design contributions to end of life and final disposition are objects; coffins, and urns designed with a focus on aesthetic, materiality and self expression.	A distributed spread of all Orders  Yet the context in which the objects exist has barely been contributed towards, showing opportunity for further Interventions in other orders of design to the spectrum of death.
RQ5 HOW  APPROACHES ADOPTED	Approaches to the End of Life The area of End of Life has been prominent in its use of design approaches	Approaches across the spectrum An increase in current and experimental design methods towards other areas, and holistically to the spectrum of death.
RQ6 WHO	Three prominent disciplines and design without designers  Three disciplines have made the majority of progress within death	Transdisciplinarity through design

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STAKEHOLDER INVOLVEMENT	and design, but for 57% of contributions with design methods, designers are not present researchers.	Creating frameworks for transdisciplinary teams to design effectively and holistically on complex topics.
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## **Appendix: References for Systematic Review**

<b>Stage</b>	<b>Number of References analysed</b>
Combined total of articles analysed	n=2024
After duplications removal	n=1826
After title relevance screening	n=232
After full article interrogation	n=94
Combined title of Grey Literature articles	n=1711
Grey Literature results after screening	n=74
Added from other sources	n=15
Total number of references analysed for inclusion	n=183