CREATING
OUR
FUTURE

A National Conversation on Research in Ireland

Creating Our Future

Expert Committee Report

April 2022

Contents

Acknowledgements

This Expert Committee report would not have been possible without the commitment of the many individuals across Ireland and internationally who supported this innovative initiative, and we are immensely grateful to everyone for their contributions.

We thank all the members of the seven multidisciplinary working groups who volunteered their time and expert knowledge to analyse the 18,062 submissions received from the public. Their analysis of these submissions involved an extraordinary amount of work within a short time frame. The volume of submissions received from the public exceeded expectations, reflecting the interest and excitement generated by this campaign. In addition, the methodology adopted ensured the submissions from the public were analysed from many different perspectives so that the richness of the submissions could be foregrounded. Their work and dedication is greatly appreciated. Membership of these groups is detailed in Appendix A of the report.

We are also very grateful to those we consulted to develop the methodology. They provided expert advice at different phases of the programme. Their names are also found in Appendix A of this report.

The Expert Committee's engagement with the Advisory Forum, particularly the Advisory Forum Subcommittee, was truly valuable, and we thank them for their insights and feedback. We would also like to thank the Royal Irish Academy and the Campaign for Science and Engineering UK for their support of our work.

Finally, the Expert Committee would like to thank the Expert Committee programme leads, Science Foundation Ireland and Havas Ireland, for the dedicated and skilful support received. This support began with the establishment of the Expert Committee and continued through to the publication of this report. We also acknowledge the coordination and support that was required to connect the work of the Expert Committee and the wider Creating Our Future Campaign.

The Expert Committee was charged with accurately conveying the voice of Ireland and with bringing forward recommendations to government in order to inspire future research and future-proof Ireland's research system. The excellent support received from everyone involved has enabled us to bring forward a report that affirms the importance of future-oriented, long-term and integrated planning for research excellence and impact.

We are grateful for the opportunity to be part of this pioneering campaign and for the collaborations and support that enabled our work.

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Prof. Brian Norton

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Executive Summary

Creating Our Future provided an opportunity for the public to submit their ideas about how research can create a better future for all.

The COVID-19 pandemic and the urgency of the challenge of climate change have highlighted the pivotal role that research and innovation have in securing that future. The campaign aimed to ensure that each person could contribute to the national conversation about research and sought especially to engage those who do not typically participate in such discussions. It also aimed to capture ideas from the public that may inspire future researchers, catalyse new research areas, and encourage new forms of collaboration. The Creating Our Future Expert Committee was responsible for analysing the submissions and synthesising the findings. Informed by the public's submissions and the expert analysis of the working groups, the Expert Committee has brought forward key recommendations that are required to deliver on the public's confidence in research and its impact.

Between the end of July and November 2021, 18,062 submissions were collected through the combination of an online portal and assorted in-person events, including roadshows and group brainstorms. Submissions were received from people of all ages, from different sectors and communities, across Ireland and further afield. This process captured a moment in time in the collective consciousness of Ireland, reflecting people's hopes and fears for the future. Issues of immediate concern featured heavily in the submissions, as did ideas for blue-skies research that have a longer horizon. The submissions varied greatly in terms of topic and length and conveyed different degrees of familiarity with the research process and the research environment in Ireland. Yet the consistent message from the submissions was that the Irish public have considerable faith in research and the value it brings to all aspects of their lives.

From December 2021 to February 2022 with the assistance of seven multidisciplinary working groups, the Expert Committee analysed the submissions. Applying a rigorous seven-step methodology (see Chapter 2 and Appendix B), each submission was scrutinised using multiple lenses. Manual and data-driven approaches were employed to examine the submissions holistically and from multiple perspectives. From the submissions, the Expert Committee and working groups identified 16 themes and highlighted the insights that could inspire future research here in Ireland. These are captured in the findings (Chapter 3) and provide a compelling account of people's enduring concerns, their unmet needs, their priorities for the near and long term, their hopes for the future and their conviction that research has a vital role to play in addressing all of these. They also highlight the public's desire for research-informed policymaking at all levels of society. The findings are structured so that first there is a summary of the public submissions on the specific theme followed by commentary that focuses on the role that research can play in addressing the theme. It should be noted that while the themes are presented as discrete fields of concern, there are significant overlaps and interdependencies.

Indeed, the submissions indicate that people are aware of the complex and entangled nature of the challenges they have identified. Addressing these challenges will require innovative practices and radical forms of collaboration.

Informed by the submissions and the analysis of the working groups, the Expert Committee has developed key recommendations for consideration by government, research-performing organisations, including enterprise, and research-funding agencies.

There are five recommendations arising from the submissions that focus on areas research should initially begin to explore, as well as six recommendations that focus on the research system and are required to enable the research called for by the public to be delivered (see Chapter 4).

The Creating Our Future campaign has highlighted the public's confidence in the promise and potential of research to transform lives and create sustainable societies. The insights captured through this process have the capacity to scaffold future research and inspire researchers. The recommendations brought forward from this process require immediate action to deliver on the expectations of the people of Ireland.

Recommendations

Areas Research Should Explore:

1. Solutions for the future cannot be developed in silos – everything is connected. Researchers should explore ways to live within our planetary boundaries with integrated sustainable solutions.

2. Accelerated research efforts are required in mental health and infectious diseases to improve quality of life and strengthen Ireland's resilience in the face of future disruptions.

3. Researchers should design, implement, and evaluate bespoke Irish solutions for services and infrastructure (from housing to transport and energy). These efforts should account for our unique geography, society, and heritage so that they benefit all.

4. Irish research needs to be at the cutting edge of emerging digital technologies that improve people's lives, increase public trust, and make for a more inclusive and fair society.

5. Research is required to harness the power of communities to generate local and systemic change in Ireland (from green initiatives to education and the future of work).

Recommendations

Strengthen the Research System to Deliver:

1. Ensure an inclusive research system in Ireland with fresh initiatives for engaged research with the public.

2. Invest in multidisciplinary, transdisciplinary, and interdisciplinary research.

3. Create the architecture to support the research-policy interface.

4. Establish an independent Research Advisory Council.

5. Develop the regional research and innovation ecosystem.

6. Future-proof Ireland by investing in a vibrant research system.

1 / Introduction

In the autumn of 2021, in the midst of the COVID-19 pandemic, the people of Ireland were invited to consider how research can contribute to the creation of a better future for themselves and their communities.

This national brainstorm garnered an impressive 18,062 submissions from people of all ages, as well as from different sectors, communities, and counties, and has generated a rich reservoir of ideas about the kind of future we might create together and the role that research can play in that process.

The overwhelming message of the submissions is that the public share a vision of the future grounded in the values of inclusion, social justice, and environmental sustainability, and have confidence that research can make a significant contribution to the advancement of this vision. This recognition of the importance of research runs across all domains and includes all research subjects. Moreover, there is a strongly articulated desire to see the fruits of research better inform the development and implementation of public policy.

With the assistance of more than 80 experts from different fields, the Expert Committee has analysed all the ideas received from the public, highlighted the main themes, and identified novel insights for research and new opportunities for Ireland.

Chapter 2 briefly describes the methodology used to organise and analyse the submissions, and Appendix B gives a more detailed account of this process. Chapter 3 provides a comprehensive account of the submissions, organised around the 16 themes that emerged through the analysis of the submissions. It also includes commentary on the insights and opportunities identified by the public as well as calls to action arising from the submissions. The report ends with a series of recommendations that require immediate action to deliver on the public's confidence in research and its impact.

The uniqueness of this report lies in the light it shines on the public's understanding of the capacity of research to help address the complex challenges we face and to create a better future. The insights drawn from this pioneering campaign reinforce the importance of Ireland's research system and the value of future-oriented, long-term, and integrated planning for research excellence and impact. Research transforms lives and contributes to individual and societal well-being, and it is hoped that the insights contained in this report will be a catalyst for research that will shape our collective future.
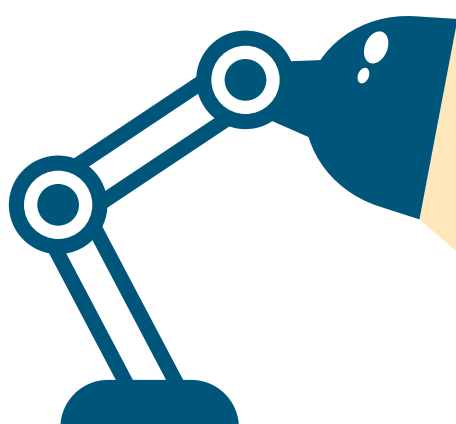
The uniqueness of this report lies in the light it shines on the public's understanding of the capacity of research to help address the complex challenges we face and to create a better future.

The future does not exist...yet.

These submissions from diverse members of the public offer a window into the collective consciousness of Ireland. What we see in these submissions is not just a looking ahead but also a looking back. Our hopes for the future are entangled in the memories of our pasts. The future is a kind of nostalgia. When attempting to imagine the unknowable, people bring forward what they do know. We revert to our own cultural scripts. This collection of imaginings tells stories of shared beliefs, situated in this particular moment in time. A moment where the cracks of our systems have been exposed. Where the public Zeitgeist tunes into the consequences of our histories and seeks redress, repair, and rebuilding. This moment is an inflection point, pregnant with the possibilities of our collective imagination. By unpacking what underlies these contributions, we have an opportunity to harness the transformative momentum of the here and now.

Future-gazing

MEMORY →

← **HOPE**

The part of the brain active when we imagine the future is the same one we use to access our memories.

2 / Methodology

The Creating Our Future Expert Committee was established in September 2021 to lead the analysis and interpretation of the submissions from the public (see Figure 1).

The aim was to distil these submissions into a single set of findings that reflected the public's voice and from there to develop a set of recommendations to inspire future research in Ireland. The Expert Committee developed a holistic and robust seven-step methodology framework and implementation plan to analyse and interpret the submissions. This involved a multi-pronged, mixed-methodology analysis using both in-depth manual and technology-driven approaches (see Figure 2). The Expert Committee engaged with the Campaign Advisory Forum and the Advisory Forum Subcommittee throughout their work to gain insight into the campaign journey from their perspectives and to receive feedback on their plans.

Under the Expert Committee leadership, five multidisciplinary working groups, a data-driven analytics team and a design research team were established to support the analysis of the public's submissions throughout December 2021 and January 2022 (see Appendix A for membership). These seven working groups conducted offline and group analysis and participated in virtual group meetings to discuss and refine their work. They were composed of more than 80 experts from various disciplines, with a range of experiences and at different career stages, across the public sector (mostly the higher-education institutions), enterprise, and the not-for-profit sector, from across Ireland and internationally. The seven-step methodology framework, along with the diverse make-up of the working groups, ensured that different perspectives and expertise were used to analyse the submissions in different ways. The combination of approaches meant that the analysis was holistic and comprehensive. Every submission was considered in multiple different ways, which reduced the potential for bias and ensured that the voice of Ireland was reflected in the findings. The Expert Committee then brought together the outputs from all working groups into a single set of findings summarising the submissions received, providing commentary alongside calls to action generated from the public submissions (see Chapter 3), and recommendations to inform the future direction of research in Ireland (see Chapter 4).

Full details of the methodology are provided in Appendix B.

Figure 1: Expert Committee Membership and Roles.

Expert Committee

Prof. Linda Hogan, Trinity College Dublin (Chair)

Data Analytics Team

Prof. Barry Smyth, University College Dublin (Data Analytics Team Lead)

Five Multidisciplinary Working Groups

Prof. Jose Bengoechea, Queen's University Belfast (Chair Working Group A)

Dr Orla Flynn, Atlantic Technological University (Chair Working Group B)

Prof. David Farrell, University College Dublin (Chair Working Group C)

Prof. Brian Norton, International Energy Research Centre, Tyndall National Institute & Technological University Dublin (Chair Working Group D)

Prof. Anita Maguire, University College Cork (Chair Working Group E)

Design Research Team

Ms Lorna Ross, VHI Health & Wellbeing (Design Research Team Lead)

Stakeholder Engagement

Dr Niall Smith, Munster Technological University (Advisory Forum Lead)

Figure 2: Seven-step Framework.

Step 1: Data validation

Step 3: Bottom-up qualitative analysis by five multidisciplinary working groups

Step 5: Top-down qualitative analysis by five multidisciplinary working groups

Step 7: Expert Committee bring together Steps 3-6 and produce findings and recommendations

Nov 2021 ≫ **Dec 2021** ≫ **Jan 2022** ≫ **Feb/Mar 2022**

Step 2: Data assignment

Step 4: Data-driven analysis

Step 6: Design thinking analysis
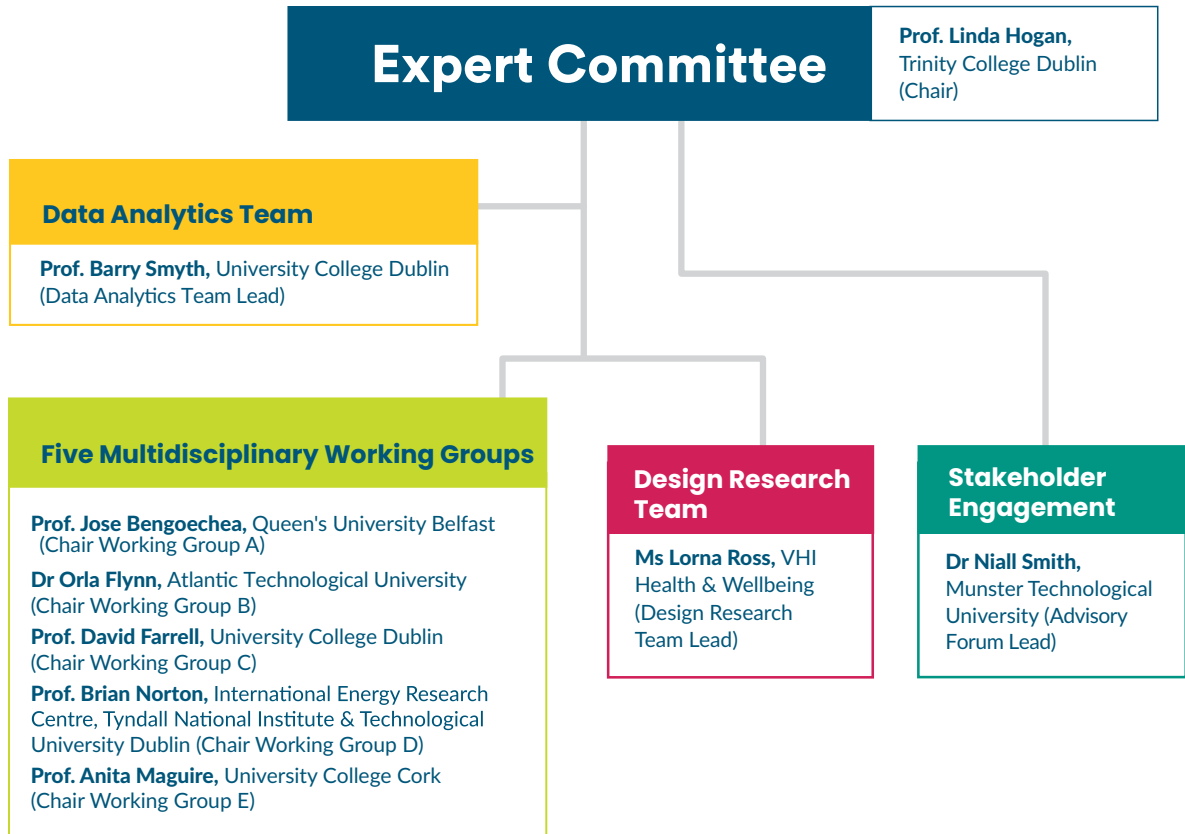
The human imagination is a powerful simulation machine

it allows us to inhabit

multiple possible futures

3 / Findings

3.1 Summary findings

Ireland's national brainstorm to generate ideas for research from the public resulted in 18,062 submissions demonstrating the public's appetite to influence the future and not just to be spectators.

People of all ages, from different sectors, communities and counties, made their voices heard. Most of the submissions came from individuals, while others came from advocacy and community groups who are passionate about particular issues.

What has emerged from this process is a rich and diverse snapshot of people's hopes for the future, their enduring concerns, their priorities for the near-term and their conviction that research can play an important role in creating an inclusive, equal, and sustainable future, for Ireland and for people around the world.

The submissions received from the public varied greatly in terms of topic, length of submission, and their degree of focus on, and familiarity with, the research process. The website invited short, free-text submissions. Many comprised just a few words, such as *'climate change', 'mental health',* or *'affordable housing.'* The average length of submission was 25 words, that is, a sentence or two, while the longest was 89 words. Forty-one per cent contained ten words or fewer (see Appendix C).

Of the thousands of submissions, many identified vital issues people believe we as a society ought to address, such as sustainability and education while others highlighted ideas for political reform or establishing the trustworthiness of technology. Some focused on opportunities to connect disparate sectors to enhance the lives of people across the country, while others proposed specific enhancements of the research ecosystem to support greater research impact in the future.

People were invited to

'tell us their idea for what researchers in Ireland should explore to create a better future.'

They were reminded that their idea 'could be based on an opportunity or challenge they saw for themselves, their community, Ireland or the world – a topic they are curious or passionate about, and would like researchers to explore'.

We are able to
describe **what we don't
want** far more vividly
than what we do.
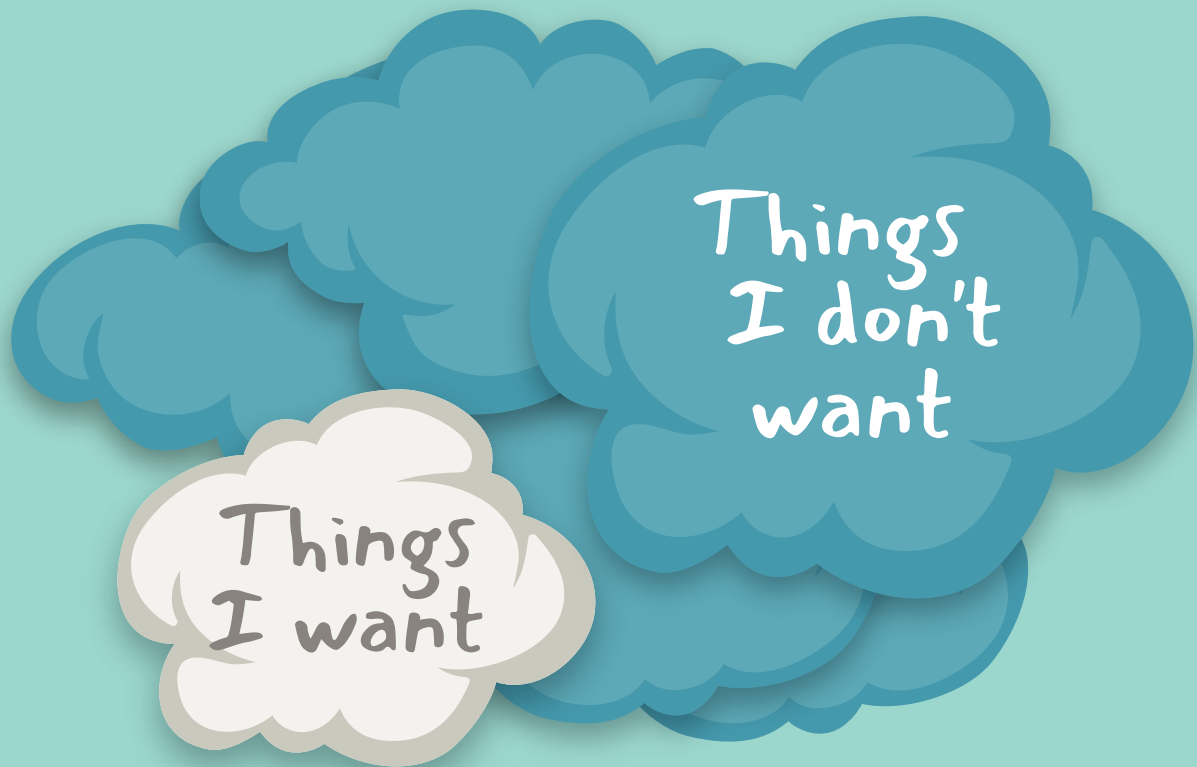
The **18,062** submissions analysed by the seven multidisciplinary working groups were ultimately clustered into 16 themes.

This was only one way of clustering, and there were significant overlaps and threads, but it was necessary to facilitate the presentation of the findings. The following themes are not in any priority order, and they do not equally reflect the volume of submissions received under any given theme.

16 Themes

Enhancing a Human Centred Approach to Health and Social Care

Reimagining Learning and Development across the Life Course

Advancing Solutions for Housing

Safeguarding Public Interest and Trust in the Digital World

Improving Policymaking and the Political System

Promoting Equality, Diversity, and Inclusion in Ireland

Fostering Regional Strengths

Valuing and Connecting Communities

Embedding Climate Action Across Society

Supporting Innovation in Farming and Food

Future-proofing Energy and Water Systems

Connecting Ireland through Green Transport Systems

Nurturing the Humanities, Culture, and the Arts

Harnessing the Benefits of Fundamental Research

Building Resilience and Preparedness: Insights from the Pandemic

Strengthening the Research Landscape and Public Engagement

The specifics of how the submissions were analysed and clustered into themes are outlined in Chapter 2 and in more detail in Appendix B. However, although treated separately, many topics or threads covered within themes were relevant to multiple themes. Submissions indicated that people are aware that many of the issues facing us are entangled so cannot be addressed in isolation. For example, our economic dependency on animal farming and our need to address the climate crisis were identified as sitting in tension.

By optimising one part of our system for change, we risk burdening another part of the system by shifting the problem to it.

The challenge highlighted by the public was therefore for research to work across competing agendas to accommodate these contradictions while working to address the issues holistically and founded on evidence.

In addition to the discrete but overlapping themes identified, two themes emerged from the analysis of the submissions as particularly cross-cutting. These cross-cutting themes speak to the pivotal role that research should play in our recovery from the pandemic and our preparedness for future disruptions and more broadly to the public perception of research, and its impact.

The 18,062 submissions evidenced a desire among the public for greater engagement with the research community. Many of the submissions noted that there is a need for better understanding between researchers and the public and a two-way communication process. There was a clear understanding of the importance of research as a catalyst for integrated development and social innovation. This, however, can only be effectively delivered when disciplinary and institutional silos are overcome so that radical collaborations can take place that address all aspects of an issue from multiple perspectives.
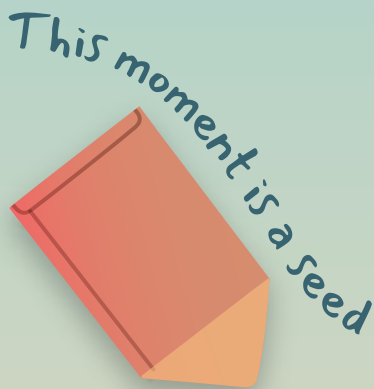
3.2 Voice of Ireland

Within this section, each of the 16 themes are described. Each theme includes and overview of the submissions from the public followed by commentary and calls to action, developed by the Expert Committee and multidisciplinary working groups, which are grounded in the specific ideas identified by the public.

These findings represent a unique and previously unavailable snapshot of the public's concerns and priorities across a broad spectrum of issues. As such, they have significance as a source of insight for policy, decision-making, and research in multiple arenas. In addition to the findings presented here, the Expert Committee calls upon researchers, policymakers and stakeholders to mine the ideas for further inspiration, acknowledging the significant contribution the public made in sharing their insights.

As the findings here indicate, the insights captured in the submissions provide the seeds to inspire curiosity and generate ideas for research that will shape the future of Ireland.

This moment is a seed

becoming

the seeds of the future

3.2.1 | Enhancing a human-centred approach to health and social care

Health, both physical and mental, was a prominent theme among the submissions, with issues cutting across many areas referred to by the public.

The submissions can be grouped into the following four main areas:

1 **Specific areas of concern and of public importance**

2 **Research and implementation within the health and social care system**

3 **Patient-centred health-care**

4 **Mental health and well-being**

3.2.1.1 Specific areas of concern and of public importance

Many submissions focused on specific health conditions such as dementia or cancer, and areas such as breastfeeding and vaccines.

Overall, the main messages centred on the importance of basic and early-stage research to better understand the challenges and for later stage research to focus on the development of new diagnostics, treatments, and preventative measures for a better quality of life.

3.2.1.2 Research and implementation within the health and social care system

Submissions highlighted the need to better embed research within the health-care system in Ireland, and central to that was the patient voice, with the need for public and patient participation and engagement in health research expressed. Submissions suggested further participatory research that involves patients, carers, and other relevant stakeholders to foster a more inclusive health-care system and to better understand people's needs. Examples included the co-design of services with patients and service users, understanding the lived experiences of people with health conditions to improve care and investigating the social and lifestyle determinants of health and well-being. Other aspects highlighted were the need to protect 'the time of health-care professionals, such as clinicians, to carry out research, the importance of integrating clinical research with that done by academia, the need to improve health-care infrastructure, such as information systems, and the importance of good communication and dissemination of research outcomes to both the public and health-care professionals.

3.2.1.3 Patient-centred health-care

These submissions focused on a number of interlinked areas but can be summarised as a call for increased quality of, and access to, health and social care services.

A summary of the topics the public referred to were:

- **Cancer, with some specific cancers highlighted**

- **Dementia and other neurological diseases, such as multiple sclerosis, motor neuron disease and Parkinson's disease**

- **Women's health, ranging from specific areas such as endometriosis and menopause to concerns such as the lack of support in Ireland on breastfeeding despite its importance. A small number also referred to specific men's health issues and also issues relevant to both e.g., infertility**

- **Cross-cutting issues such as ageing, death, and better care and supports for older people or those with disabilities, such as autism, and the social determinants of health**

- **Chronic diseases and disorders such as: diabetes, cardiovascular disease, stroke, autoimmune diseases, thrombotic disorders, coeliac disease, foetal alcohol spectrum disorder, cerebral palsy, polymyalgia rheumatica, primary sclerosing cholangitis, Niemann Pick**

- **Infectious diseases, such as COVID-19, antimicrobial resistance, HIV/AIDS, and tropical infections**

- **Mental health and its impact on individuals and wider society from anxiety, depression, and loneliness to severe mental-health issues such as psychosis**

Public insight:

There was a clear call to action from the public that they want better diagnosis, treatment, and prevention of diseases and incorporation of research into the health-care system. A number of submissions highlighted the critical role a public Irish genomics programme could play in delivering the call from the public.

'I would like to see researchers work with patients, public, clinicians, health policy makers and industry to design safe ways for our population's genomic data to be used in research and medicine to improve personalised prevention and early intervention medical care. The current lack of genomics policy, public education, and investment in genomics research and medicine is impoverishing our population health, especially the vulnerable.'

The importance of person-centred approaches was stressed, as was the inclusion of systemic interventions in digital and technological innovations and infrastructure to promote patient empowerment and deliver better care and patient experiences. Prioritising prevention through diagnostics and screening, especially genomics and genetic techniques, was also highlighted, as was enhancing standards of care at primary and acute level through evidence-based standards, and the integration of care in the community particularly in promoting independent living among the ageing population.

Submissions also advocated for the use of research in stimulating a more holistic and interdisciplinary approach to care and in future-proofing our health system through learning from the pandemic.

The importance of optimising existing models of funding allocation and management in the health systems was highlighted. Developing effective policies to support staff recruitment, retention, professional development, and including professional recognition for the spectrum of health-care roles that enhance the quality of care (e.g., hospital or emergency department pharmacist), were also expressed.

Submissions included the reimagining of a more inclusive and equitable system based on free and affordable health-care and promoted the need to identify innovative ways to foster more equitable access for people of different socio-economic status, genders, and for vulnerable groups. Specific groups mentioned included people with addictions, sensory impairment, disabilities, eating disorders, those within the autism spectrum, those with chronic conditions as well as the ageing population, young people, and the LGBTQ+ community. A small number of submissions also advocated the investigation of alternative or holistic care approaches to health.

3.2.1.4   Mental health and well-being

Submissions in this area focused on social inclusion, child and adolescent mental health, and healthy ageing and well-being.

A wide range of submissions called for greater research on topics within the broad area of social inclusion. Groups at risk of exclusion mentioned were wide-ranging, and examples included those with precarious work situations (e.g., zero hours, short-term contracts), adults living with parents due to housing costs, those experiencing bullying, family carers, those in debt or experiencing financial struggles, racial/ethnic minority groups, isolated rural communities, and those who have experienced trauma, adverse childhood experiences, and abuse.

Submissions prioritised perinatal, child and youth health – particularly mental health – as the key areas requiring further research as well as evidence-informed interventions and public funding in services.

The continuum of prevention (the protection of public mental health and well-being), early intervention (provision of supports for mental health difficulties) and treatment (mental health interventions/secondary services for mental illness) was stressed. Within these submissions, frustration at the lack of community-based, mental health promotion supports, programmes and services was expressed. There was a lack of public knowledge about the existing evidence base on mental health. There was also concern about the lack of access to timely, appropriately resourced mental health services for young people in crisis, the rising rate of youth self-harm and suicide in Ireland, and the need to evaluate the efficacy of the statutory mental health services. Submissions also articulated the link between mental health and participation in sports and access to culture opportunities, while others focused on the impact of mental health issues on the wider family unit.

Several submissions referenced well-being and healthy ageing, including independent living, access to health and social facilities, and working beyond 65. Submissions also highlighted the need for research on the long-term cultural and societal implications of an ageing population, for the whole society and for the economy. Well-being in general was a strong cross-cutting thread throughout the submissions, e.g., access to nature or supporting creativity, and is reflected in many of the themes, with people calling for a healthier, happier, more inclusive, and equal Ireland.

Public insight:

A desire for a more inclusive Ireland was a strong thread throughout the submissions. Issues of concern for minority groups were also highlighted throughout various themes, including health. While this exercise was to synthesise the voice of the public, it was also to capture minority voices.

'A rapid Beutler test. Currently babies that are born to Traveller women have to undergo a Beutler test to test for galactosemia and have to wait 2-3 days for the results. This interferes with the establishment of breastfeeding for the newborn and feeding babies soya formula comes with risk. More breastfeeding would help improve health inequalities for the Traveller community.'

Public insight:

The public's submissions were a reminder that everything is connected and entangled and that global challenges have real local and individual impact. Many submissions focused on two challenges that affect every country – climate change and health – and while there are similarities, the effects, root causes, and solutions can be very different both at national and local levels and across different contexts and countries. The public were interested to know what the impact is for the Irish public when these two challenges collide.

'How changes in our climate impact on our health.'

Commentary and Calls to Action

The public voice has identified the need for research to tackle pressing health and social care issues from specific diseases to healthy living, and better access to health and social care as well as the importance of well-being.

1 Integrate research within the health and social care system to holistically address the issues raised by the public. This needs to be connected to the work of academic institutions and industry, and the public should be a central part of these research endeavours. In this regard, there is a need for infrastructure improvements, e.g., to deliver large-scale clinical trials, and staff training, patient-centred approaches, and collaboration across sectors and disciplines to achieve this. The recently established national Public and Patient Involvement (PPI) network will play a key role here.[1]

2 Enhance communication with the public on health research in Ireland. There was a perception from the public that health research is not well funded and supported already in Ireland. This is particularly relevant for rare diseases and neurological disorders but may also reflect the large volume of submissions on specific health conditions.

3 Focus research efforts on better screening, diagnosis, treatment, prevention, and interventions to improve quality of life; this should include further fundamental research with a focus on societal impact.

4 Carry out additional and coordinated research efforts on infectious diseases and immunology taking a 'One Health' approach involving multiple disciplines and sectors. We live in an interconnected world where the health and well-being of humans, animals, and the environment are entangled and must be addressed in this way.

5 Increase research efforts on mental health.

   The mental health and emotional suffering experienced by specific groups highlighted by the public has been the focus of a wide range of research studies internationally, but evidence in an Irish context is less cohesive.

   i.   Consideration should be given to a national large-scale longitudinal population-based study that bridges the gap between health and social care and academia.

   The public concern around self-harm and youth mental illness is noteworthy given that in Ireland, there are higher self-harm rates among young people and among girls especially, and the age of early onset for self-harm is rising (National Registry of Self-Harm, December 2020). Self-harm is an indicator of serious mental and emotional distress and a strong indicator of suicidality.

   ii. Potential research opportunities include a national specialist research programme in mental health prevention involving multiple disciplines and leveraging existing infrastructure such as that of the Department of Children, Equality, Disability, Integration and Youth (DCEDIY) and the Children and the Young People Services Committees (CYPSCs) in each county.

6 Increase research efforts on women's health, particularly areas that are non-pregnancy-related, such as research on chronic disease in women, menopause, and gynaecology conditions. Significant progress has been made in Ireland regarding research in women's health, but the focus has been on maternal and child health and on perinatal health. However, maternal health was prominent in the public's submissions and there are chronic conditions, such as postnatal depression and back pain (during and after pregnancy), that require further research in an Irish context.

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1   https://www.nuigalway.ie/ppi/

3.2.2 │ Reimagining learning and development across the life course

Learning and development emerges from the submissions as an area of significant interest. This is a very broad theme focusing on education at all levels, from early years through to postgraduate education, as well as lifelong learning. The call for 'reform' features strongly, whether at early years, Leaving Certificate or in how we deliver postdoctoral education. Many of the submissions highlight the importance of cultural education and the role of the humanities, while some suggestions focused on the process of learning itself, e.g., *'explore how to teach the general public to do research themselves'*; and *'research how to boost literacy*

and de-stigmatise the effort to learn how to read and write effectively at a high level whether adult learners or youth.'

Submissions can be clustered into four main areas according to their focus on:

1   Early years development

2   Lifelong learning and education

3   Primary and secondary education

4   Higher education

3.2.2.1   Early years development

Submissions falling under this area cover a mix of specifically early years education, breastfeeding and other issues relating to development and well-being in early to middle childhood. Many relate to health and well-being at a specific point in the human life cycle. Illustrative examples include: a call to research the impact on babies in pushchairs of being faced away from the parent or adult pushing the pushchair, with specific lens on babies' social, emotional and psychological development; to investigate the outcomes of prioritising play above 'learning'; the use of machine learning algorithms to individualise sensory playroom stimulation; and calls to increase breastfeeding and early childhood support in maternity services and in the home, given that stressed parents in the first few years of a child's life can cause lifelong problems, including chronic illness. The question of how we implement and advance the findings from projects such as Growing Up In Ireland[2] and Preparing for Life[3] arose along with how the barriers to implementing the learnings could be better understood and addressed.

Public insights

Many submissions provided suggestions for curriculum additions across the different levels of education:

Health and well-being

- Mental health, meditation, yoga, more physical education, exercise, and nutrition

Life skills

- Financial literacy, pensions, insurance, tax, pay, mortgages, DIY, driving skills, first aid

Community/place

- Nature/outdoors, consent, empathy, the environment, entrepreneurship, circular economy, climate justice

Thinking

- Critical thinking, digital fluency, scientific logic/thinking, philosophy, creative thinking, systems thinking, independent thinking, problem-solving, ethics

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2   https://www.growingup.ie/

3   https://www.preparingforlife.ie/

3.2.2.2   Lifelong learning and education

Several submissions highlighted the importance of education for life and indicated concern that the school system is educating people for taking a terminal examination, namely the Leaving Certificate. The argument expressed was that many of the soft skills that people need for life are not getting sufficient coverage in the curriculum.

Key areas that were seen as inadequately covered include physical activity for health, gender, sex, and relationship education, home and personal financial education, digital literacy and digital risk, and Ireland's history of both migration and exclusion and aggression towards those who were or are 'othered'. Submissions touched on apprenticeships and how a focus on trades and associated skills being taught in primary and secondary school might be useful both in terms of life skills and a shift in attitudes towards alternative paths to further and higher education (e.g., apprenticeships). The need to promote and improve attitudes towards learning Irish and foreign languages and to improve how we teach them came through in several submissions.

3.2.2.3   Primary and secondary education

A range of issues were covered in submissions relating to primary and secondary level education. Submissions highlighted the importance of whole-person development beyond just an academic focus; homework and its value, work-life balance for children; the length and type of the school day and week; and the implication of shorter days for Junior and Senior Infants, with specific mention of its impact on gender equality, women in the workplace and on climate.

Submissions also highlighted literacy, numeracy, and digital literacy issues for individuals in the education system as well as noting the importance of video and other digital media, gamification, and technology more generally in education. Concerns about inclusion and poverty were raised in the context of education. These highlighted a desire for better education for immigrants and refugees, school transport for disadvantaged children and the impact of free lunches in schools. Submissions also noted the problems of bullying and of male suicide.

Among the submissions were topics relating to child welfare and rights. Some related to the role of the state (such as Tusla), others highlighted some specific concerns associated with research involving children. In the submissions on primary and secondary education, the importance of teacher training and education in preparing our teachers for a multi-cultural world, and in dealing with children with disabilities and mental health was also highlighted. Some submissions also called for the separation of church and state in our school system.

3.2.2.4   Higher education

The majority of submissions relating to higher education focused on issues of student accommodation and mental health. The educational areas highlighted included the need for more places, equality of provision, and no fees. The need for sustainable quality in the learning experience at higher education was also stressed as were the challenges associated with transitions, both into higher education and from there to the workplace, and the importance of identifying the reasons that account for poor student engagement among some students at third level.

Many submissions suggested the addition of new skills, subjects, and approaches at all levels of education in Ireland, including "life skills". Submissions under this theme expressed a need to rethink the curriculum for today's contexts, needs and behaviours and attitudes. Examples referred to virtual reality, 3D printing, coding and game design that are set to dominate careers in the future, and a need to prepare primary and secondary school students for this world. Also, within the submissions were numerous calls for more yard and outdoor time as done in other countries, with an opportunity to explore ways of incorporating learning into play and physical activity.

Commentary and Calls to Action

There was an overarching sense from some of the submissions that schools in Ireland are 'clinging to the traditional ways of teaching', and there is a need to re-evaluate to ensure it is fit for purpose in the 21st century. Also, the public highlighted that childhood is a time not just for education but for development, and there is a need to re-evaluate the role of education in terms of learning for life – not only skills for jobs as the system is not equipped to prepare young people for living in today's society.

1   **Focus on implanting the findings of existing research conducted in Ireland and internationally.**
    For example, the effectiveness and benefits of increased physical and outdoor activities as part of the education curriculum has been widely researched. Research should play a role in identifying the barriers to implementation, co-creating and piloting solutions for the Irish context and then embedding evaluation into any changes implemented.

2   **Integrate findings within existing research efforts in Ireland, which are already working to address many of the concerns raised by the public.**
    While this exercise doesn't represent the whole of Ireland, this was a good opportunity to validate some of the existing research under way, e.g., a recent pilot study assessed the feasibility of implementing and evaluating 'Quiet Time' built into the curriculum in two pilot settings in the UK and Ireland.[4]

    Further consideration should be given to individual submissions within this theme by those involved in learning and development research and policy, particularly to identify where the public could be involved in their work, e.g., the public is interested in further dialogue on the education curriculum at all levels.

    Increased efforts to communicate to the public on existing research may be warranted given the public's interest, and consideration should be given to a national initiative to encourage staff, students, and parents to look critically at current offerings and co-create new approaches. The design thinking approach would suit this challenge.

    Insights garnered from this exercise may inform the National Council for Curriculum and Assessment (NCCA) that is currently in the process of a stem-to-stern re-evaluation of second level.

3   **Additional research is required:**
    - In languages, particularly the Irish language
    - To re-evaluate the role of education in terms of learning for life not only skills for jobs
    - To inform the talent and training for skills of the future
    - On the future of parenting – several cross-cutting issues were evident in the submissions from maternal health and early childhood development to parental leave, childcare supports and parents' careers. Research is required to determine how Ireland could become the best place to parent.

4   **Develop implementable plans to train, develop, and upskill the teaching workforce and focus on diversifying it.**
    Determine if there is a need to bring ethnic, gender, religious and cultural diversity into schools, particularly to disadvantaged areas, so children will identify with staff and the educational environment.

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4   https://www.frontiersin.org/articles/10.3389/fpsyg.2021.765158/full

3.2.3 | Advancing solutions for housing

A large number of submissions related to housing, homelessness, and the housing crisis. Many of these solely called for action to address the problem, while others put forward potential solutions and others wanted to understand the problems further. Frustrations were expressed about the perceived lack of effective policy solutions to the housing crisis and an urgent need for research to inform policy and practice.

Submissions broadly fell under the following four areas:

1   Cost of living

2   A focus on purpose-built housing with appropriate facilities

3   The importance of sustainable housing for rural and town development

4   Learning from other countries

3.2.3.1   Cost of living

Submissions focused on the cost of living highlighted social housing needs, including issues of fairness, design, and provision, and the need to streamline local authorities' ability to deliver housing. In addition, the need for affordable mortgages, affordable homes and to examine the feasibility of communal and cooperative ownership modalities; the need for sustainable renting options, including long-term options; and the social impacts of the housing crisis, e.g., stalled transition to adulthood and mental health, were features of the submissions.

A lack of affordable housing was noted as a factor in the emigration of young people to other countries, e.g., the UK. In this category, submissions also noted the economic barriers to retrofitting housing to be more environmentally sustainable, as well as the issue of hidden poverty among the middle class. Submissions highlighted the need to hear the voices of people who are renting, in social housing and to develop people-centred solutions. The public highlighted the need to address the current homelessness crisis, investigate the root causes of it, and identify early intervention points to avoid people ending up in crisis situations.

3.2.3.2   A focus on purpose-built housing with appropriate facilities

A number of submissions highlighted the need for appropriate, purpose-built housing for different cohorts of people. Groups with specific needs highlighted in the submissions included the Traveller community, those among the ageing population, those with disabilities who wish to live independently, single people, lone parents, those wishing to downsize and low-paid workers in Dublin. The need for certainty for 'the rental generation' as they get older was also noted in this regard. In the context of appropriate homes for current and future generations, several submissions highlighted the need for more apartment blocks, sustainable houses or buildings including non-traditional homes, e.g., folding homes, log cabins, docked cruise ships, containers, and novel ways to build low-cost energy-efficient homes such as those designed to function without fossil fuels, modular homes, and what were described as 'homes of the future.'

Public insight:

Many of the submissions focused on preserving water and maximising the use of rainfall. The public view this to be an important element in the development of sustainable homes of the future.

'With the plans for development of new houses and homes to meet demand in the coming years, it is very surprising that drinkable water is used for all purposes in households. Surely it is not necessary to have drinking water for us for toilets, showers and washing clothes and water from rain harvesting systems would be suitable for this purpose.'

3.2.3.3 The importance of sustainable housing for rural and town development

Many of the submissions on housing were about rural and town development which overlaps considerably with the theme fostering regional strengths. Submissions noted the value of preventing and reversing dereliction, utilising empty buildings in our towns, and developing desirable family homes, within existing town and retail units close to all the amenities and benefits of a city. Suggestions on improving the desirability of living in rural areas and the importance of developing communities were made such as access to amenities, e.g., playgrounds with new builds and renovations for families, and constructing cycle lanes and footpaths.

Public insight:

Innovation within the construction industry was referred to by some submissions and the need to utilise existing technology or develop new materials for the development of sustainable homes.

'Research in automation of building technology, machines that aid/build parts of structures on their own, (e.g. 3D printed houses). To build housing faster and more effectively.'

3.2.3.4 Learning from other countries

Multiple submissions highlighted the lessons that Ireland could learn from experiences in other countries. Specific examples recommended by the public to be considered in Ireland included: the Swedish model for private investors and two-year cap on short term rentals; the Danish co-housing model; the 'Street Votes' policy,[5] conceptualised in the UK; and the norm of long-term renting that is widespread in countries like Germany. Some submissions suggested that there is too much emphasis in Ireland on home ownership and long-term renting is not incentivised. Some submissions expressed the need to understand the issues further, such as identifying and communicating what the blockers to building more homes are, while others highlighted the need to hear the voices of those who are renting, in social housing etc., the need to streamline local authorities' ability to deliver housing, to address issues of procurement, and to create multidisciplinary teams needed to support tenants.

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5   https://policyexchange.org.uk/wp-content/uploads/Strong-Suburbs.pdf

Commentary and Calls to Action

The Irish public view housing affordability and accessibility as one of today's most urgent problems and call for government intervention. The housing crisis is not unique to Ireland and is complex. It is increasingly recognised as a global issue, particularly in urban areas. Housing in Ireland is a focus of a growing interdisciplinary research literature, but there is no real consensus on the causes of the crisis or potential solutions to it, and more work is required. While there is a significant call to action from the public, there is a need for the research community to consider the role they can play in addressing the crisis further.

1   Create a coordinated national approach to funding research on housing to address the public's call for research to play a leading role in identifying solutions and accelerating and evaluating their implementation. While numerous research funders in Ireland are addressing aspects of housing, including collaboration with international funders, further coordination and collaboration is required. There are opportunities to engage with policymakers through the Housing for All[6] policy which is a multi-annual, multibillion euro plan to 2030 intended to improve Ireland's housing system and deliver more homes of all types for people with different housing needs.

2   Conduct further research into homes of the future, including repurposing and developing new innovative and sustainable purpose-built housing and material solutions. Examples of projects that will play a role in this include the Digital Academy for the Sustainable Built Environment[7] and the Build Digital project.[8]

3   Ensure research informs policy development, including international best practice, and that research evaluates policy implementation, including the adverse effects on various groups in society.

4   Develop a communication and engagement plan with the public around the issue of housing, particularly the complexities of the problem and the potential solutions, and the role research can play.

5   Further economic research into ownership and renting models in an Irish context is required.

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6   https://www.gov.ie/en/campaigns/dfc50-housing-for-all/

7   https://dasbe.ie/

8   https://www.builddigitalproject.ie/

| 3.2.4 | **Safeguarding public interest and trust in the digital world** |

While significant overlap and cross-cutting issues were identified within this theme, the two main areas are summarised as:

1. **The health and well-being effects of digital exposure**

2. **Digital technologies and the public interest**

3.2.4.1 Health and well-being effects of digital exposure

Submissions pointed to the need for research to examine the impact of technology use and how this can adversely impact overall health and psychological well-being.

Key themes identified in these submissions proposed research on the effect that electronic devices/screens, social-media platforms and gaming are having on day-to-day life with the need to understand the associated health impacts across the various user age cohorts, especially young people.

Public insight:

While many opportunities for digital technologies were highlighted by the public, there was a significant focus on the challenges, such as fake news, impact of social media on mental health, eye health and childhood development. Developing skills as part of the education system was also prominent, and social inclusion was evident throughout many of the themes described. One way of addressing this, as proposed in a submission could be to focus on digital-free zones and times.

'Digital free zones- no laptops, no phones! Interactions or non-digital activities only. If the metaverse is going to be a thing and young parents are worried about their children developing soft skills either due to COVID-19 or not, it needs to be given more thought.'

In particular, many submissions pointed to the need for greater research on cognitive development and the mental health and well-being effects of technology on younger children and social-media use in adolescence and early adulthood. Submissions also identified the need for research on the impacts of remote and hybrid working on family life and worker well-being and how the transition to digital devices and services has affected older adults. In this context, some submissions considered the negative impacts of a growing digital divide as it pertains especially to older populations as well as lower income households.

The submissions with a particular focus on social media included the positive uses, such as social media as a medium for social inclusion through community engagement and communication or accelerating knowledge distribution for societal benefit through knowledge transfer networks or to create a better understanding of what researchers do. Others focused on the negative impacts, such as on body image, addiction, or online bullying.

Submissions referred to the need to research the impact of social platforms (e.g., Facebook, TikTok and Instagram) which often present a modified version of reality that may lead to feelings of exclusion, anxiety, isolation, and mental health issues.

To help counterbalance this, some submissions questioned how we can provide effective training to improve technological skills in young and elderly persons and equip children and parents better in relation to children's online exposure. Some submissions also looked at the possibility of developing 'safe' platforms, e.g., a closed online or app space for older people, free from spam and fraud that can be used for community inclusion and assistance. Other submissions considered whether mature digital technologies, such as future artificial intelligence (AI), will be a significant aid to independent living.

3.2.4.2 Digital technologies and the public interest

Key areas identified in the submissions include threats to social cohesion and democracy including misinformation and fake news, dissemination of hate content and the influence of social media on democracy, social freedom and politics; digital divides in participation and inclusion, particularly the integration of minority groups, older people and people with disabilities. Other areas identified social media as an avenue for toxic masculinity and extreme pornography and sexual content, and its relation to, or use as a defence for, sexual assault and homicide cases. Others highlighted the broader ethical concerns and considerations that have only become evident in a digital world and the need for digital rights to protect citizens in an increasingly digital age. The implications of (un)equal access to information and communications technology was a concern with the desirability of embedding IT ethics in teaching and learning at all ages being highlighted.

Many submissions argued the need for better oversight and regulation of social media and a need to better understand the implications that rapidly evolving technologies have on Irish society.

These included the concept of the metaverse and the importance of quantum computing and AI (perhaps combined) and the need for Ireland to consider appropriate policies. Other submissions highlighted the importance of the study of digital currencies, policies around financial forecasting, the role of cryptocurrencies and blockchain technology in global economics, and how these might impact Ireland.

In terms of intervention and policy work, a range of submissions supported the need to investigate potential policy changes and educational interventions that could bring about greater awareness of the potential risks and benefits of digital technology on different cohorts in Ireland. Despite the potential adverse effects of digital technologies on health, well-being and social issues, some submissions were calling for a better understanding and evidence base of the issues to inform the development of potential solutions given technology is now unavoidable in modern times.

Public insight:

Submissions received in Irish to the campaign were wide-ranging, from sport to cyberbullying, to the impact of pollution on fish. Some specifically focused on the Irish language.

'Is gá taighde a dhéanamh ar thionchar na meáin (craolta agus clóite) ar an nGaeilge. Taighde a dhéanamh ar chinntí i dtaobh craoladh nó foilsiú trí Ghaeilge nó trí Bhéarla agus tionchar na meáin idirnáisiúnta ar an nGaeilge anseo. B'fhiú comparáid a dhéanamh go hidirnáisiúnta ar conas a dhéileálann tíortha eile ar an domhandú (tionchar cultúr Angla-Meireacánach) chun a theanga a chosaint. /Research needs to be done on the influence of the media (broadcast and typed) on Irish. Research on the decisions to broadcast or publish through Irish or through English and the influence of the international media on Irish here. It would be worth doing an international comparison on how other countries deal with globalisation (the influence of the Anglo-American culture) to protect a language.'

Commentary and Calls to Action

Ireland has responsibilities and must play an important role in debates about the future of digital media and social media because many major technology companies have their European headquarters in Ireland, and, as a result, Ireland is the lead regulator for these companies in Europe and Europe's principal host for digital technology. There are innovative proposals for models of self-regulation and accountability in Ireland; the public are calling for these to be implemented and for better oversight of social media. Researchers in Ireland are investigating these models and are focusing on a large range of issues relating to digital technology, including many of those raised through the submissions. There is also already a rich vein of research in this area (internationally and in Ireland) including on how to regulate digital spaces, how to automatically detect harmful content, and the factors that influence online behaviour, beliefs, and the implications for democracy. In the case of disinformation research, research insights from psychology have been translated into free online games that can be used in classrooms to teach media literacy. Research has been conducted in cooperation with groups that are targeted by hate speech to ensure their voices are heard and contribute to proposed responses.

1   Prioritise the public's interest when it comes to designing and regulating digital technologies. There is a need for research on the impact of digital technologies and social media to assist with policy development and evaluation. There is also a need to increase collaboration with the wider system that plays a role within this theme beyond researchers and policymakers, e.g., librarians and enterprise.

2   Engage regularly with the public on existing research and with the research outcomes given the dynamic nature of the digital world.

3   Focus is required on the advantages and longer-term health concerns of digital technology user demand given the digital era we now live in; longitudinal research studies should be considered here. The public identified digital access, empowerment, and safeguarding (e.g., rural areas, elderly, young) as key areas.

4   Utilise digital technologies for inclusion in democracy and decision-making. The public are keen to be involved in policy and decision-making but research is required to better understand the impact/control of automated decision-making by software and the potential for negative outcomes before they should be implemented.

5   Promote high quality (e.g., large sample, longitudinal design, objective measures of design use, intervention based) research to understand the immediate and longer-term psychosocial risks and benefits associated with digital technologies, given the ubiquity of smartphone and digital screen use in Ireland. The effects of screen time and social media use on key aspects of mental health and well-being are currently widely debated. Studies with large samples and strong methods (e.g., pre-registered predictions, combining a range of modelling approaches) have found weak associations between reported digital technology use and mental health and well-being. Examining the psychosocial effects of objectively assessed time spent on specific types of applications and devices, and the type of content viewed, has been highlighted elsewhere as a direction for research in this area.

3.2.5 | Improving policymaking and the political system

Within the submissions there was direct and indirect references to politics and policymaking. Within this theme the submissions can be grouped under two main areas:

1 The policy process

2 The political system and its reform

3.2.5.1 The policy process

A prominent topic observed was the need for research to identify best international practices in the operation of the policy process, particularly in how to encourage longer term horizons in policymaking. A large number of submissions were focused on particular policy proposals (many of which are dealt with elsewhere in this report), including: automatic provision of housing for the disabled; travel/commuting time as a billable time/expense; high cost of insurance related complaints; the benefits of state provided childcare; high cost of rental accommodation. Other proposals included whether cryptocurrency could benefit Ireland; an effective deterrent to dangerous driving; the impact of blockchain technology on democracy; state taxation policies that would facilitate remote working; new ways to measure success rather than gross domestic product (GDP) (e.g., people's enjoyment of life); research into a terrorism emergency action plan; research into the financial implications of refusing to trade with rogue states.

3.2.5.2 The political system and its reform

A common thread was on whether the existing legislative and administrative systems of governance are fit for purpose. There were calls for a smaller parliament, to abolish the Seanad, to change the electoral system, to focus on corruption in politics and for increased transparency in allocation of funds and public services. Some entries spoke of the need for better engagement between policymakers and citizens, including through citizens' assemblies - in which Ireland is already a world leader. A number of submissions called for research on specific themes relating to the political process. These included how to introduce long-term thinking and planning that lasts beyond the next election cycle. There was also interest in the potential of digital in our democratic processes (such as the e-voting used in Estonia); the potential of participatory budgeting in Ireland; and whether an assembly of elders should be created to enhance democracy.

Among the submissions, some opportunities unique to Ireland were noted. These included the opportunity to harness Ireland's international record as a world leader in the use of participatory, deliberative approaches to debates over constitutional and policy reform, and the promotion of Ireland's unique place in the world as a neutral, former colony with a good record in international aid, etc. Other submissions noted that there is an opportunity to enhance access to funding in the social (and political) sciences.

Public insight:

The public see opportunities for being part of the EU and the only country with English as the first language; Ireland also has a strong political sciences and an EU policy research community.

'Ireland's unique position in the EU is the only country to speak English natively. How Ireland can leverage that position for the betterment of the country while not giving into neo-liberal ideology.'

Public insight:

There was a clear call to action from the public to strengthen evidence-based policymaking in Ireland at local and national level and to establish mechanisms to do this effectively.

'I think government should interact more with research on how to do things better, policy wise and governance wise too. There should be a department for using research in governing the country.'

'Better integration of science in policymaking for evidence-based policymaking, e.g., more collaboration with scientists and more scientists working in the public service.'

Commentary and Calls to Action

The political system, threats to it, and its reform have been major areas of research in Ireland and generally over the past decade or more. At a time when democracies are under threat, it is not surprising to see the political system feature in many of the submissions. It was noted, however, that in several instances the submissions revealed a gap in understanding of how politics and the policy process operate in Ireland or what the specific reforms they call for would end up achieving.

In addition, there were a number of entries referring to corruption in politics, even though, by international standards, Ireland fares quite well in this regard. However, as identified by the study of electoral behaviour, the theme of corruption tends to feature in debates over political change (not least by populist politicians from the hard left or right), and, therefore, it was not surprising to see this emerge.

1   Develop ways to implement longer-term thinking and planning that lasts beyond the next election cycle. There are opportunities to learn from international best practice such as Finland's parliamentary committee for the future[9] and the work on the future incorporated into the prime minister's office agenda.[10]

2   Harness Ireland's international record as a world leader in the use of participatory, deliberative approaches to debates over constitutional and policy reform.

3   Consider how to better inform the public on how politics and the policy process in Ireland operate for the public to be more involved in the policymaking process.

4   Ensure research-based evidence is embedded in policy development at a local, regional, and national level in Ireland.

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9   https://www.eduskunta.fi/EN/valiokunnat/tulevaisuusvaliokunta/Pages/default.aspx

10 https://vnk.fi/en/foresight

3.2.6 | Promoting equality, diversity, and inclusion in Ireland

Submissions under this theme referenced a wide range of topics and clearly set out a vision for Ireland as a more inclusive society where all can thrive. The submissions highlight the public's view that there is potential both to research and to find opportunities for the creation of an inclusive society with equality and rights for all.

The submissions considered here and the general thread of equality, diversity and inclusion featured in nearly all of the other themes, highlighting the importance the public place on this issue.

Moreover, the intersectional dimensions of inequality viz economic, educational, gender, ethnic, age and other factors also loom large in the submissions. In addition, submissions highlighted concerns about growing economic inequality and the societal divisions this inequality creates.

The four main areas within these submissions are:

1   **People with special needs and disabilities**

2   **Equality**

3   **Multiculturalism**

4   **Social inclusion**

3.2.6.1   People with special needs and disabilities

There was a desire to see a greater focus on building a more inclusive society for people with special needs and people with disabilities, particularly in their day-to-day lives, focusing on practical issues of transport, access to work, to culture and education. One submission focuses on labour market outcomes of people with disabilities.

3.2.6.2   Equality

References in this area included gender, social class, and migrant groups, as well as those relating to the Traveller community and to refugees. Submissions also noted elder bias and problems of exclusion.

Public insights

Creating a more inclusive Ireland was a thread observed across the submissions received. Below is a summary of some areas and specific submissions received within this theme:

- **Universal basic income**
- **Urban–rural divide**
- **Social determinants of health and access to health and social care**
- **Diversity and inclusion in decision-making, particularly policymaking and regional development**
- **Educational inequalities**
- **Impact of income inequality linked to wellness indicators**
- **Gender bias (pay, jobs, medicine, education, sport)**
- **Ageism and women**
- **Class divide in creative careers**
- **Over 60s potential through a contribution lens**
- **Quality of life for long-term disability recipients**
- **Impact of COVID-19 on inequalities**
- **Why is academia/research dominated by white middle-class voices?**
- **How women, who cannot have children, negotiate a child-centred society**
- **Research queer geographies – how do LGBTQ+ people exist in Ireland post marriage equality.**

People also have concerns about girls dropping out of sport and physical activity with consequent health implications, concerns about boys and men's aggression towards girls and women as well as the potential for boys and men to take advantage of vulnerable girls and women with poor financial or digital literacy.

Public insight:

There was a strong desire from the submissions to create a more inclusive society here in Ireland. Ireland has a strong reputation in the tourism sector, and many parts of society are dependent on this sector which continues to recover from the COVID-19 pandemic.

'Promote specific tourism packages for tourists with disabilities. This would involve substantial supports for tourist services and focused marketing programs in major countries around the world where there are already substantial advances for services catering for disabled populations. The niche market could be as much as an extra 10–15% increase.'

Research is recommended on new content standards for all media in Ireland to prevent normalisation of harmful attitudes and behaviours around violence, sexuality, and profanity. Submissions also see the resolution of this issue of inequality to be linked to educating people about the capacity we have had historically to do harm to those who are 'othered' or minoritised within the national group. Recommendations for research in this regard focused on providing avenues for integration into Irish society for asylum seekers. In the context of gender equality, submissions also highlight the problem of misogyny and the dominance of white middle-class men in setting societal priorities (including research priorities) versus more diversity and more female leadership.

3.2.6.3   Multiculturalism

In addition to the concerns about equality, many of the submissions on multiculturalism have a practical orientation and are concerned with creating inclusive communities and spaces. Questions posed include how to encourage cultural diversity in Irish towns, what role public libraries can play in cultural growth by engaging young people, what the potential is for cultural centres in towns and community development. The inclusion of other languages on street signs is recommended as a reflection of the multicultural society.

3.2.6.4   Social inclusion

Low population density can bring challenges of social inclusion (e.g., isolation or lack of social and health-care facilities). Submissions suggest that organisational research can facilitate improved distributed delivery in these settings particularly to meet the needs of particular groupings, e.g., innovative practices in rural areas and in farming, particularly around issues of environmental sustainability; the role women play in agricultural and rural community innovations; the role of migrants in rural areas (including their contribution to rural society and their current and future embeddedness and sense of belonging); the realisation of future opportunities among rural young people; the elderly; and how to eliminate issues of isolation and detachment.

These submissions on inclusion intersect with submissions on many other themes, but especially those of education and health. Regarding inclusion and education, issues of literacy and numeracy in families, including new and digital literacies were highlighted. In addition, multiple submissions raised issues of equality of access to higher education. Specific concerns raised included student fees and the adequacy of the third-level grant, the provision of transport to and from education institutions, the affordability of student housing and the perceived lack of support for neurodiverse young people. In terms of inclusion and health, as detailed in the health section, equitable access to health and social care was a prominent theme throughout these submissions.

Public insight:

Submissions noted that while legislation is being enacted to tackle the gender pay gap, further research will be required to assess the efficacy of such measures.

'Once the Gender Pay Gap Information Bill 2019 is fully implemented, employers over a certain size will be required to publish pay differences between female and male employees, including any bonuses. Research is needed to monitor the implementation of this legislative initiative, employer practices and to assess the impact of gender pay gaps on careers and career progression.'

Commentary and Calls to Action

It is evident from the submissions across many of the themes that the public are calling for a fairer and more inclusive Ireland. As observed in the valuing and connecting community theme and evident in recent societal changes implemented in Ireland through referenda, e.g., marriage equality, Ireland has strengths here that need to be built on to make Ireland the most inclusive country to live in and visit. Research has a dual role here, to focus on developing, implementing, and evaluating solutions to increase not only inclusiveness in Ireland, but also to increase inclusiveness in research itself conducted in Ireland.

1 Prioritise developing a national capability for inclusive engaged research, drawing on best practice, to inform future public engagement programmes.

2 Consider what needs to be done to future-proof inclusivity in Ireland. This should involve researchers and policymakers. Some specific cohorts and areas mentioned by the public included:

- Prioritise developing a national capability for inclusive engaged research, drawing on best practice, to inform future public engagement programmes.

- A more inclusive decision-making process with a diversity of perspectives.

- The issue of gender in research studies was raised by the public. In the past three years, significant progress has been made towards improved representation of females in clinical trials, although there is still work to be done within specific medical fields.[11]

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11 https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2781192

3.2.7 | Fostering regional strengths

The public had many ideas on how to strengthen their region and local area for a better quality of life for all.

The submissions under this theme can be grouped into three broad areas:

1 Governance

2 Planning

3 Sustainable regional development

Some of the submissions focused solely on urban or rural areas, some reference both, and there are overlaps throughout.

3.2.7.1 Governance

Submissions in this category raised questions about whether county councils can manage towns optimally, whether new structures are needed such as local governing councils, or whether there are better ways of citizen engagement and collaboration. There were also questions about a role for the EU in towns in Ireland.

3.2.7.2 Planning

A common thread was the need for better, more coordinated planning to address issues such as stopping further building on areas at risk from rising sea levels, regeneration and reuse of derelict buildings, and 15-minute cities. Several submissions called for research on the potential of a new city to take pressure off the Dublin area and benefiting from being able to start with a blank sheet. However, not everyone agreed with this idea. For others, the focus should be on existing towns rather than on new cities.

There were also calls for research on 'Smart' (technology enabled) cities to support diverse communities across the island. A number of submissions called for a rural taskforce, whose members should come from and know about rural areas. There were calls for research on how to make Ireland a better place to live, work and visit, such as by developing structure around cycle ways in both rural and urban areas and centred around safety; expansion of cultural landscape signage in national parks; improvement of our engagement with our past through research on old churches, towers and fairy forts combining environmental studies, the arts and tourism.

3.2.7.3 Sustainable regional development:

Perceptions of the availability of economic opportunity and development are often polarising, including between urban and rural communities, and this was evident in some of the submissions received. The submissions ranged from health-care to agriculture and the environment, and to consumption; and there were references to localised or personalised solutions that take on board local or personal needs, which can be more effective than broad-brush solutions. A number of submissions called for the greening of buildings in cities and towns; green walls, mandating rooftop gardens, south-facing bricks with holes for bees, bat and bird boxes, orange/red lighting less harmful for nocturnal animals, more ponds and wetlands.

There were calls for more research on how to improve both outside and inside spaces in cities and in rural areas. The expectations from the public is that the outcomes will improve: (i) mental health, (ii) the sense of communities, (iii) opportunities to socialise (especially for lonely, the elderly and teenagers), (iv) opportunities to enjoy cultural activities; (v) an urban design that respects the diversity in community; (vi) biodiversity and (vii) a clean/safe environment.

Initiatives could include, inter alia: the planting of more (native) trees at every scale from small plots to large-scale rewilding of the countryside; teaching people how to grow fruit and vegetables; more use of wood as building material for sustainable housing. The link between more trees and green areas and improved mental health was expressed by the public.

The submissions reflect the desire of the public for more research and collaboration between the public, stakeholders, and researchers across Ireland focusing on the regions and local areas for a more joined-up and effective approach based on the needs and priorities of the communities living within them. Further opportunities unique to Ireland, arising from the submissions include: the development of a typology of Irish towns: their age; how they were designed; common and unique features (e.g., some have market houses, some have town squares, greens, etc.); the encouragement of towns in Ireland to be model towns, test beds for innovation including working with companies involved in energy and housing; and the development of sponge cities and green infrastructure. This would include looking to developing nations to see how they are designing their cities and recognising that planning needs to be more design-led.

Public insight:

Ireland has strengths in particular sectors across the regions, and Ireland is a small country that has a strong track record of working across research, enterprise, and government. There is a need to capitalise on these prior investments and to identify discrete priorities and co-develop solutions.

'Ireland has a focus on two technical areas: pharma/biotech/medtech and computer sciences. Enabling the two to collaborate more closely could apply AI to defining structures of natural elements like proteins and enzymes, detect defective structures in disease, and create treatments to overcome the defects'.

Commentary and Calls to Action

The public are calling for a more coordinated and inclusive approach to developing the regions. Ireland stands out from many other European countries in having a highly centralised governmental/administrative structure, with the weakest local-government system in Europe. These are all contributors to a lack of joined-up thinking on the regional agenda.

While community and civic engagement are often stronger in rural areas, there are governance challenges especially since the abolition of town councils. There is already work under way between the academic community, stakeholders, and citizens across the island of Ireland, which began in 2019, focusing on the revitalisation of Irish towns, and the consensus for change is evident not only in the submissions but also through ongoing work, such as the emerging Town Centre First Policy (Programme for Government) and the government's Town Centre Living Initiative.

In addition, economic development is observed as polarising between urban and rural areas. These perceptions persist despite the convergence of income distribution among urban and rural, particularly when differential cost of living is applied. Remote working and commuting allow for these trends to be maintained, facilitating both the gains from agglomeration and from improved quality in lower density areas. Solutions, however, are not simple, and further research is required as well as engagement with urban and rural communities on the issue.

1   Focus on generating and implementing further evidence and research for effective regional development in Ireland. Research should play a key role in better planning, for example, to develop a greater understanding of public and stakeholder priorities (e.g., housing, infrastructure, nature), challenges (e.g., climate change), and opportunities (e.g., digitally connected) for regional development and then identify what are the feasible and practical local solutions.

2   Facilitate technological, organisational, sustainable, cultural and governance solutions for effective resource allocation in both urban and rural areas through further research efforts.

3   Determine, through further research, how to improve both outside and inside spaces in cities and in rural areas. It will be key to facilitate interdisciplinary research, involving social scientists, in the built environment, particularly as smart city projects[12] come into the demonstration phase.

4   Explore community engagement in innovative community climate action practices – research should examine the level of engagement, successful practices, and the contribution of community engagement processes to Ireland's response, given the public are interested in being involved.

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12   www.smartcitiesireland.org

3.2.8 | Valuing and connecting community

A large number of submissions were community related. A common notion that emerges throughout can be characterised in the Irish language as *Meitheal* (people coming together to assist neighbours). As indicated in the submissions, Ireland has long-held strengths and a large culture around communities, volunteering, and supporting one another.

The submissions indicated a strong interest in building on the needs of healthy, diverse, better integrated and more eco-sustainable communities, with particular emphasis on humanity, kindness and reaching out to minority, migrant and/or vulnerable communities in a creative, practical and effective way.

Many of the areas and threads identified in these submissions are also dealt with elsewhere in the findings, such as: ageing (e.g., oral histories of ageing populations; wisdom pods); health (e.g., community hubs for those with chronic illness); food and agriculture (e.g., community food movement); and the Irish language.

Other areas identified have been grouped under the headings of:

1 Inclusion

2 Integration

3.2.8.1 Inclusion

Submissions in this area included a proposal to establish an organisation to connect people (especially retired) with skills to those who need them; a focus on supports to build cooperatives and collaborative projects; opportunities for inclusion and diverse cultural representation in media; sharing histories and stories; building inclusive communities using the Tidy Towns model; better community engagement in places like Dublin, where communities can be more transient; providing free evening transportation; evolving Irish socialising past 'the pub'; digital empowerment for rural communities; and a focus on developing amenities and cultural organisations that are often missing in local communities, including public science museums; gender neutral spaces, and women's facilities.

There were several requests for more interdisciplinary research that could improve the urban environment and the mental health of citizens, with a focus on enabling more outside space that can be enjoyed by the community.

Public insight:

Throughout the submissions there was a desire to build on Ireland's culture of communities through harnessing the power of people for greater societal benefit and ensuring these attributes are promoted into the next generation.

'How do we encourage more active and engaged citizenship, encourage a move from the idea of "individual" to a greater practice of community.'

'Research the impact on children's attitude to community support after seeing efforts made by volunteering parents/guardians, especially during emergencies like COVID-19.'

3.2.8.2 Integration

Here submissions focused on steps to improve the integration of migrants/refugees (including calls for an end to direct provision); the development of information sources on Irish culture for new migrants; language training for gardaí (notably in Polish), and the inclusion of other languages on street signs. These entries reflect a common concern to protect, include, and better integrate all members of the community. Those members that were referred to most often were: migrants, refugees, LGBTQ+, the elderly, new parents, teenagers, people with disabilities, and the Traveller community.

The submissions included several interesting insights, some of which were presented as opportunities potentially unique to Ireland. These include opportunities linked to in-migration patterns and to our growing diversity nationally; consideration of the role of migrants in rural areas, including their contribution to rural society and their current and future embeddedness and sense of belonging.

In this context a submission noted the unique opportunity for Ireland to build on our current research leadership on Smart (technology enabled) Cities to support diverse communities across the island. Other submissions highlighted the opportunities to focus on environmental–social interfaces in relation to community health and tourism, and on community-focused aspects of Irish culture.

Commentary and Calls to Action

Connectedness and the importance of the locale are prominent features in traditional Irish political culture that survive to this day. We start from the advantage of already having well developed distributed networks, strong community connections, and other community-focused aspects of Irish culture (e.g., a history of charitable giving as a nation). The Irish have a love of local places and a strong sense of identity as well as a generally social disposition and openness that creates a rich environment for local initiatives to thrive. As indicated in the submissions, these are attributes we must build on and promote throughout our society and where research can play a key role.

1   Build on the current research endeavours on Smart Cities and Irish towns and utilise community-related aspects of Irish culture to support diverse communities across the island and deliver on some of the other topics raised in themes, such as transport, sustainability, education, social inclusion, and health.

2   Investigate and develop new approaches for the promotion of Irish as a living language as well as traditional heritage.

3   Investigate and utilise the opportunities linked to in-migration patterns and our growing diversity nationally, e.g., in communities and the workplace.

We have arrived at the end of abundance thinking
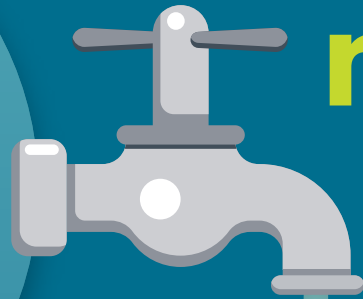
renew
is the new
new

3.2.9 | Embedding climate action across society

Within the submissions, there was a broader call for embedding climate action across society, in addition to the later themes on farming and food, energy and water, and transport. There was a very strong focus on the circular economy and recycling, removing unnecessary or unsustainable practices, and tackling these issues as a nation. Submissions viewed food waste and packaging waste as part of the same problem, rather than as an element of plastics/ marine pollution. There was a very strong concern about the over-use of plastics and, in particular, too much single-use (particularly in product packaging and medicine). There was a related interest in replacing synthetic fibres and dyes in clothing. Several submissions sought research on better alternative methods to recycle/degrade plastics (e.g., using microbes, algae, fungi); new locally sourced replacement materials for plastics; nanoparticles that degrade in the natural environment; more biodegradable products such as doggy poo bags and takeaway food packaging; new effective non-toxic, non-ozone-layer-depleting, non-greenhouse-gas replacements for fluorocarbon gases; low embodied-energy, locally sourced, sustainable (e.g., using wood, hemp and cellulose) building components with environmentally friendly flame retardants; an interest in the development of road surface and construction materials made of waste (e.g., recycled construction waste, plastics); and the use of real-time material tracking to reduce construction waste.

The overriding concerns of the public, as captured in these submissions, are to have less packaging as part of responsible business practices; to encourage more recycling by incentivising sustainability, and better waste management. This involves the availability of more public recycling bins, free recycling of home waste, including large items such as furniture, or payments for recycling. Submissions also focused on the importance of education to get more people to recycle properly.

Several submissions mentioned the desirability of finding alternative methods of reducing the export of our waste.

A return to bottle banks is advocated together with recycling by reverse-vending machines, promoting reuse (e.g., via government-sponsored repair shops), as well as the design of easily cleaned lightweight non-plastic reusable/refillable containers/packaging. A number of submissions also noted the importance of addressing the behavioural aspects of polluting, for example, to modify littering behaviour, or to reduce day- and night-time noise pollution's impact on quality of life.

Submissions questioned what forms of (mostly) fundamental research might help to better position Ireland to take advantage of our natural assets and resources and create a uniquely better, healthier, and environmentally sustainable ecosystem. Many expressed the need to address the general targets associated with the United Nations (UN) Sustainable Development Goals. As a society, submissions effectively argued that we need to consider how to leverage existing assets - the built and natural environments – and repurpose them to meet the current and future needs of communities on all scales. Many of the submissions advocated research from the viewpoint of prevention – of ecological and/or humanitarian disasters – illustrating a general concern about the future of the planet and the societies it supports. Submissions also called for research into how to raise awareness and knowledge of biodiversity.

Many submissions were linked by the imperative to use research to mitigate against the most serious consequences of the mismanagement of the Earth's ecosystem and to inform about adaption strategies where mitigation is no longer possible. Many suggestions related to climate change and its effects on biodiversity. Examples included conservation of pollinators, better/continued soil management and improved understanding of the response of different microorganisms to the shock of extreme weather events. In the context of a changing world, a number of submissions asked about the evolution of design and materials for sustainable eco-housing.

In the arena of climate justice, submissions focused on the need for practical day-to-day advice on how individuals can directly impact climate change.

Proposals included the need to develop toolkits for local (and often marginalised) communities to engage in climate action; to gain knowledge of best practice in effecting behaviour change to reduce negative impacts on climate (e.g., from waste dumping and overconsumption); to understand the economic implications of climate change over a 50–100-year timescale; and to focus on understanding how to build the necessary societal and institutional resilience and cohesion to respond to the challenges and disruption of climate change now and in the future.

The development of social enterprise as a solution to environmental problems was seen as a particular solution to youth unemployment and the retention of youth in rural and urban areas. The development of social enterprise could involve research to work with communities to promote the circular economy, shared economy, and include the development of government supported workshops (to reduce waste), etc. Many of these submissions highlighted strong linkages with the development of rural areas, but the social enterprise solution to climate justice is regarded as relevant to all areas.

Submissions see opportunities in the development of urban and rural sustainability co-ops, which would also provide skilled local employment in, for example, cultivating crops and seaweed for carbon capture. Additionally, continuing the thread of developing competencies for climate justice, some submissions on this topic noted the positive role that toolkits could play in the future for holistically managing different aspects of environmental impact (e.g., energy, water, waste, food).

Public insight:

Within some submissions, the public identified how the challenges could begin to be addressed and have wider social and economic impact.

'Closing local resource loops (energy, water, waste, food). Identify opportunities to develop through social enterprises/ cooperatives. How to develop and manage urban and rural sustainability co-ops providing skilled local employment.'

'Greening existing infrastructure using nature-based solutions in cities/towns/ villages to support the environment as well as improving economic and social well-being.'

Commentary and Calls to Action

Within this theme, submissions covered areas where research could play a significant role, but also many of the calls to action were around implementing existing solutions better and to make the sustainable decision the easier decision for all.

1   Determine how minimal use can be made of packaging through further research, with that packaging used made from locally sourced materials.

2   Increase efforts on materials research – from products to buildings to clothes – and on recycling and incentivising and facilitating recycling better in Ireland.

3   Enhance research efforts to understand how to build the societal and institutional resilience and cohesion necessary to respond to the challenges and disruption of climate change.

4   Ensure 'research for knowledge' in all disciplines is a key focus, with the possibility that such knowledge might result in truly disruptive advances for society (not all technological).

5   Investigate, through further research, how organisations and individuals can make a difference in addressing climate change and feel motivated and empowered to do so. It is essential that the social sciences play a key role in this research.

3.2.10 | Supporting innovation in farming and food

Submissions clustered under the theme of farming had a strong focus on sustainability and innovation. They highlighted the importance of supporting the agriculture sector to reduce its carbon footprint. There were ideas about new farming paradigms (e.g., without intensive growing of individual crops at once) based on circular economy principles that grow crops with health benefits (e.g., plant-produced recombinant antibodies) and about carbon capture using biochar and the importance of peatlands and wetlands in controlling carbon release. Others focused on the potential of natural products as resource/potential commercial products (e.g., fungi/Irish bogs; milled gorse/rural uplands; hemp in coastal farming).

The topic of plant-based alternatives to animal-derived products also emerged from the submissions. There was a strong interest in more locally grown food to ensure food security with more organic farming. In this context, food waste and methods to manage/reduce waste was a common thread. Submissions also suggested identifying the valuable aspects of animal wastes (e.g., phosphorus recovery) that could reduce the need for dangerous slurry pits, less use of artificial fertilisers and of peat, and increased use of composted household waste to reduce carbon footprints.

Submissions showed a strong interest in new agricultural technologies. Ideas included devising unavoidable/convenient farm safety systems that reduce accidents (e.g., how to safely agitate animal slurries to reduce farm accidents), more use of electric farm vehicles and vertical farming and the development of automated health scanning of foods (e.g., for prions and other agents). Other issues associated with farming practices such as production of genetically modified food (with submissions both for and against), uses of antibiotics and agrichemicals also featured in the submissions. There were inputs on new ways to increase soil carbon and organic matter (in peat-free crop production) precluding the need for both fossil-fuel-based fertilisers and chemical insecticides/fungicides, as well as proposals for evaluating the uses of 'natural' herbicides (e.g., juglone, derived from walnuts,

on Japanese knotweed) and grazing animals (e.g., goats) to control the gorse cover that fuel wildfires. There were ideas proposing research on harvesting/milling gorse and its reuse as an animal feed and suggestions to investigate how to sustainably grow sufficient crops locally that can be the feedstock for materials (e.g., hemp, cellulose) that can totally displace the use of plastics.

Public insight:

Some of the submissions articulated a specific challenge in people's daily lives, why it should be addressed, and detailed where research could play a role:

'One of the leading causes of accidental deaths in Ireland is farm/field bodily harm from incorrect use of PTO (Power Take Off unit; found on tractors). Industrial design challenge for a Poke-Yoke adaptor system to radically redesign the PTO user interface for safety, with minimal loss of convenience. Mechanical engineering and AutoCAD + prototypes etc. Essentially, a design research project. Share results worldwide.'

A cluster of submissions recommended rewards to farmers for growing more native trees and hedgerows and enhancing biodiversity. Others referred to the need for research to better understand how farming practices (such as the timing and extent of hedge cutting) influence biodiversity, as well as the impact of rewilding on recovery of native species and biodiversity in Ireland. Recommendations for research on the benefits of native planting (including in residential green areas) edible species (such as elderberry, crab apple) also featured as did the encouragement of local harvesting. Understanding the causes of changes in Irish bee populations and pollinators was also a recurring area. Submissions also highlighted the importance of native forest and peatland on hydrology and carbon sequestration and proposed the creation of a network of wildlife corridors, linking bogs to national parks and developing wild gardens along motorways to both offset carbon and encourage flora and fauna.

There were suggestions for the creation of a website/app to collectively enable public monitoring of plants and animal biodiversity, like the 'Birdwatch Ireland' map, and a broader recognition of the importance of addressing holistic risks to marine and water ecosystems, including the seabed and peatlands.

The importance of improving our food was expressed from both production and consumption viewpoints which covered both science and policy considerations. Examples included research on the costs and benefits of intensive/extensive farming, and research into grants and incentive schemes that work to include farmers in a national strategy of decarbonisation, green economy, and environmental protection in a fair and equitable way. Other submissions considered the need to maximise the nutritional content extracted from the land without the use of traditional fertilisers, supported by policy initiatives to encourage healthy eating, while the benefits of fungi and bacteria as sources of nutrition need to be better understood.

Human-created pollution was a cause for concern, with a need to better understand the effects of such pollution on the natural environment to overcome the challenges.

Submissions also displayed a recognition of the links between sustainable farming and healthy populations. There were proposals to educate the population about nutritious healthy environmentally sustainable diets via clear food labelling that highlights nutritional data and the carbon footprint of food and food packaging. The opportunity to develop plant-based/cultured meat alternatives was noted as was the opportunity/desirability to introduce taxes for unhealthy food, as well as targeted interventions for people experiencing homelessness and those on low income (e.g., issuing cards for access to food as opposed to paying cash benefits) so that they can similarly enjoy the benefits of any such transition.

Commentary and Calls to Action

Within many of the areas raised by the public in this theme there is active research ongoing in Ireland and a strong base to build upon.

1   Enhance existing research with the insights from the public on agri-tech. Significant research and infrastructure investments have been made in Ireland in recent years; therefore, the additional ideas raised by the public in this theme should be considered by and taken up in contemporary research efforts in agri-tech.

2   Continue to address the diverse ways farming can enhance natural ecosystems and the wider environment through further research.

3   Carry out research on eco-economic business models.

4   Accelerate efforts to develop engaged research projects and programmes and public awareness on existing research and its outcomes within this theme.

3.2.11 | Future-proofing energy and water systems

Within these submissions there are questions for policymakers and the energy sector as to how Ireland should capitalise on our natural energy resources to become a world leader in wind, solar, tidal, wave and geothermal energy with appropriate energy storage (thermal and electric) and better battery designs. Specific interventions proposed included removing barriers to lowest operational and embodied energy renovation of all existing houses (particularly for those experiencing energy poverty) and non-domestic buildings; and measuring and tracking the energy used by data centres and capturing this for use for district heating. There are recommendations that researchers develop new technologies to cost-effectively deploy photovoltaics on all buildings and outdoor space coverings (e.g., awnings, car parks); create more viable (possibly modular) easily deployable systems for harnessing waves, tides, rivers, and rain to generate electricity; design and produce renewable energy systems (such as wind turbines, photovoltaics, and batteries) whose components are designed to be fully reused/recycled. Submissions also sought research to establish the appropriate use of hydrogen and on how to produce hydrogen from renewable energy more efficiently (e.g., with new catalysts); develop new forms of electrical energy storage using more abundant materials (e.g., sodium ion batteries) and consider new forms of energy transmission (e.g., wireless energy transmission for rapid charging of electric vehicles).

Public insight:

While many submissions sought research on, and a shift towards, green sources of energy, some went further by suggesting research on models for local generation and distribution of green energy.

'I think researchers should expand on distributed green energy models for the country. At the moment, there is an over-reliance on the centralised power grids, that are fuelled by both fossil fuels and green energy. We should explore differing distributed models where households and localised communities would be better able to generate green energy, that can ebb and flow with other localised locations i.e. a prosumer.'

Submissions also suggested that communities, farmers, and landowners should be enabled to install small-scale wind and solar farms to further decentralise energy supply and transmission, while keeping the ownership and benefits of these renewables within the community. In a similar vein, submissions recommended that consideration should be given to building-integrated renewables being treated and paid for as national infrastructure rather than expecting private citizens and homeowners to pay for the energy transition to renewables.

For nuclear energy, from the submissions there is a recognition of a need for clear objective information about the full life cycle of financial, social, and ecological impacts from uranium mining, electricity production to the disposal of radioactive waste.

The interactions between water pollution, drinking water quality and human health are major areas of concern. There is a recognition that new techniques are needed to ensure security of supply, lower distribution losses and quality monitoring/assurance of drinking water supplies. More availability of clean water in public spaces (e.g., public fountains to reduce reliance on plastic bottles) is advocated. There is a suggestion that the state develop separate drinking water and non-drinking water supply systems, to achieve more direct local use of rainwater for the latter via local collection and use (e.g., in buildings for sanitary purposes, recycle rainwater on car windscreens to refill screen wash container).

There are submissions noting the desirability of water conservation and management (and networks/systems for achieving that). Other submissions focused on water note the importance of mapping flooding risks and their impacts on livelihoods, as well as the need for better understanding the roles of urban wild meadows, forests, and bog/moss land in flood prevention.

Commentary and Calls to Action

The energy and the environment debate that has formed part of the national Zeitgeist in recent years is reflected in the submissions. There is a significant body of research ongoing in Ireland and internationally within this theme; however, the public are calling for solutions to be accelerated and implemented in their daily lives, and there is a clear desire for the Irish public to be involved.

1   Accelerate efforts to develop engaged research projects and programmes and public awareness on existing research and its outcomes within this theme.

2   Continue to focus on research aimed at improving highly-distributed renewable energy production, distribution, storage and efficient end-use for the widest range of applications with strong community and social benefits.

3   Promote the need to reduce operational and embodied energy use and greenhouse gas emissions from buildings and in manufacturing processes; research should address radical reductions in end-use energy requirements, minimising new materials use (by reuse and recycling) and energy poverty.

4   Implement a holistic view of water resources, their distribution and end-uses which should inform and drive relevant research with more consideration to local reuse of grey water and rainwater.

5   Reflect on the scope for cross-border initiatives and research that take advantage of our island status and promote cooperation between Ireland and Northern Ireland, particularly regarding the topic of water raised by the public.

3.2.12 | Connecting Ireland through green transport systems

Transport has wide-ranging impacts on the economy and well-being of individuals and communities. Submissions made observations relating to how transport affects the sustainability of communities through effective connectivity or otherwise, different socio-economic groupings disproportionately, physical health and mental well-being through emissions and stress, and how it impacts on climate change from resourcing through to operation and uses valuable and limited global physical resources. Submissions argued for research to optimise both outside and inside spaces to improve: (i) mental health, (ii) the sense of communities, (iii) opportunities to socialise (especially for the lonely/elderly and teenagers), (iv) opportunities to enjoy cultural activities and (v) an urban design that respects the diversity in community. Transport plays an important role in all of these.

Transport features strongly in the context of submissions that demonstrate the value that the public place on public services. The submissions showed a strong desire to see an expansion and better allocation of resources to all public services (education, health, gardaí, provision of home care services). There was also a strong demand for easy access to information for dealing with public services. In the context of transport, school transport and traffic were strong threads across submissions. For example, the environmental impact of junior and senior infants finishing school earlier than other year groups, which creates a significant number of extra car journeys. Another issue raised was the large percentage of students who arrive to school in cars, leading to increased traffic congestion, carbon emissions and parent and commuter stress. Suggested solutions included the wider roll-out of the school bus system, improved cycling infrastructure on school routes and 'walking/cycling bus' supervised by parents in urban areas. It was suggested that same-sex schools also contribute to unnecessary traffic on our roads with parents having to travel to two schools. A number of submissions posed questions about whether schools offering supervision from 8am to assist parents commuting to work for 9am would ease rush-hour traffic.

Public insight:

The promise of hydrogen-powered vehicles was noted in several submissions.

'There should be concerted effort to transform our heavy transport modes: trucks, buses, trains to green hydrogen. As more becomes available, research is needed into transmission versus local electrolysis at bus garages, rail depots, trucking companies and ports.'

Many submissions focused on the critical need for sustainable transport options, e.g., to create better business hubs linked across the country. There was a strong focus on green transport, both private and public, and the need to encourage more sustainable approaches to the use of buses and trains. Revitalising the train transport systems (inter-city, intra-city and trams) and its use for deliveries/haulage was one focus. The need to provide incentives to encourage the public to use public transport was also commonly referenced. More research on the barriers and incentives to the use of public transport by the public was called out in submissions, and the potential of free public transport generally, or at least for people with disabilities, was mentioned.

There was widespread support for greater use of electric cars, but against the backdrop of a need for better infrastructure to accelerate their adoption, including more electric charging points, better batteries, and better incentives to purchase. More research was sought on the overall carbon footprint of electric cars (e.g., environmental costs of importing, manufacturing, and disposal/recycling of batteries). Given the resources required to build new cars, it was suggested that opportunities for adapting existing cars to electric vehicles should be explored. Submissions also argued that other green transport technologies, such as hydrogen powered buses, need to be considered. Alongside this, the public expressed a need for better urban and housing planning to encourage and facilitate people not to use cars or to use cars minimally, as well as more park-and-ride options.

Public insight:

Submissions recognised that improvements in transport infrastructure may lie in tension with other factors such as environmental concerns and that a holistic approach involving all stakeholders is required in the early stages of planning.

'Research how we introduce better transport (public transport, bike and car) systems without losing all of our beautiful old trees...We need to balance the health and visual benefits of our historic trees with needs to improve transport. These findings would help all town planning!'

Submissions reflected on the need to prioritise green transport design. For example, supporting cycling as a mode of transport to reduce the number of cars on the road needs to be accompanied by a better environment for cyclists, including issues often overlooked such as secure storage and parking options and storage on trains. Similarly, the public identified the need for better walking routes and facilities. Based on the submissions from the public, research is needed on the potential (and cost) of public transport that supports an overall greener economy, one in balance with nature that protects biodiversity. For example, how do we expand transport infrastructure while preserving cultural heritage? Many submissions argued for the provision of better transport options for rural living (e.g., electric minibuses linking small towns and villages; trains with carriages for cars).

Submissions sought to look at transport from innovative perspectives that would also have a lower carbon footprint. Examples include a comprehensive monorail system; urban cable cars; use of canals for transport; lakes, rivers, and estuarine public transport; the use of drones to reduce unnecessary congestion; reimagining use of the Dublin Port Tunnel more generally; reducing CO_2 emissions in ports and on ships.

Commentary and Calls to Action

Many of the submissions in this theme were challenges and opportunities from individuals' experiences to support a better quality of life and improve access to products and services.

1   Reimagine transport for all citizens (ages and locations and all modes) based on what is feasible and value for money for the demographics and population distribution across Ireland, involving researchers, the public and key stakeholders (including enterprise and policymakers).

2   Investigate through further research how to facilitate access to climate-friendly transport solutions across all socio-economic levels.

3   Promote research to ensure Ireland can become an innovation leader, rather than a follower, in the development, implementation and access to green transport.

4   Focus research efforts on well-being associated with living in lower-density population centres, which needs to be better understood and evidenced. In this theme it is around access to better green transport options but this should be researched more broadly within other areas.

5   Ensure coherent and holistic solutions are developed and implemented; many city and county councils have invested substantial sums of money in research and analysis regarding transport of the future but further research is required to determine if these investments collectively provide coherent solutions.

3.2.13 | Nurturing the humanities, culture and the arts

Many of the submissions explicitly highlight the role the humanities, culture and the arts can play in creating a better future, while other submissions, for example those focused on health, politics, or technology, seek non-technocratic, holistic solutions to societal challenges.

The submissions were clustered around two main areas and highlighted the centrality of the arts and culture for individual and societal well-being, and for the empowerment of communities across Ireland to reimagine a better future on a sustainable planet.

The areas covered by the submissions focused on:

1   **The role of the humanities, culture, and the arts for research and innovation across all domains**

2   **Innovations in the artistic and cultural domains in support of a more humane and inclusive society**

Public insight:

The Arts, Humanities and Social Science (AHSS) communities have a significant role to play in addressing many of the submissions received within and across the themes. These ranged from how to better understand human behaviours and implement sustained change to how we as a society reimagine and define progress.

'What makes people truly happy. As we have to move away from a culture that is driven by consumption as a measure of success how do we identify the factors that make for a happy society and people, and convince people to vote for that type of society? And incentivise things that make lives better, not worse.'

3.2.13.1 The role of the humanities, culture and the arts for research and innovation across all domains

Multiple submissions highlight how the humanities, culture and the arts foster the development of innovative, open, healthy, and inclusive societies and of engaged citizens.

Whether concerned primarily with health and well-being, housing, the digital revolution or climate change, submissions highlighted the power of the arts and humanities to support and augment scientific advances, and to ensure that technical solutions are implemented in socially responsible ways. In support of this objective, many submissions proposed a greater focus on arts and culture at all stages of the education system. There were many recommendations for the expansion of the curriculum to include more anthropology, classics, global studies, philosophy, drama, and musical performance. In particular, their capacity to promote skills of critical thinking, problem identification and solving, creativity and communication was acknowledged across many of the submissions. Complementing the emphasis on the intrinsic value of these fields for the future of society, many submissions also highlighted the importance of transdisciplinary and interdisciplinary research in understanding and addressing major societal challenges.

3.2.13.2 Innovations in the artistic and cultural domains in support of a humane and inclusive society.

The submissions expressed a confidence that culture and the arts could enable Irish society to imagine alternative futures, with specific proposals about advancing cultural understanding and peace in the cross-border, shared island context. Multiple submissions developed practical ideas for collaboration between artistic and technological professionals to envisage positive humane visions of a sustainable future, with ecological balance. There were ideas to develop cultural hubs, small theatre spaces and other resources in towns and rural areas to support the arts and as a spur for social inclusion and integration.

Other proposals advocated the deployment of new technologies to archive, preserve and drive engagement with our archaeological and deep cultural heritage, histories, and crafts. Some submissions highlighted the economic as well as the social contributions of culture and the arts, with some submissions focused on the importance of the creative industries for the Irish economy. In that context, some submissions made proposals to further develop the creative industries, based on secure, accessible career pathways.

Technology shapes our environment but culture shapes our behaviour

Public insight:

The role of the arts in communicating with the public was highlighted as an opportunity to communicate complex issues with the public in a different way.

'Commission artistic collaborations between artists and technical/scientific professionals to envisage positive, humane visions of a sustainable future, with ecological balance. Many science fiction movies depict a dystopian future, or irritatingly saturated with intrusive technology. Let's change the narrative and provide vision, and leadership in Eco-futurism.'

Commentary and Calls to Action

Ireland's reputation for excellence in the humanities, as well as for cultural and artistic creativity is long-standing, and a source of national pride. Humanities research, whether focused on languages, literatures, and cultures, on philosophy and ethics or on histories – global, national, and local, plays a vital role in fostering individual and societal well-being. Additionally, the vibrancy of the contemporary cultural and artistic landscape attests to its importance to the Irish public.

While the submissions overwhelmingly desire holistic and human-centric solutions to their issues of concern, there was limited input focused explicitly on research in the humanities, despite the clear importance of research in disciplines such as history, philosophy, ethics, etc. in terms of informing policymaking, and promoting societal well-being.

1 Promote research involving multiple disciplines, where the AHSS community plays a key role. This is required to achieve the solutions desired by the public.

2 Enhance engagement with the public on AHSS research, as it may be that the public understanding of the significance of AHSS research is underdeveloped and new initiatives in this area would complement the proactive approach in communication of STEM research in Ireland in recent years.

3.2.14 | Harnessing the benefits of fundamental research

Submissions that sought research into fundamental questions identified the importance of new knowledge as a potentially beneficial disruptor for society. Most submissions in this theme focused on the need for a better understanding of the physical world and the laws that shape it. Examples included a better understanding of quantum mechanics and its potential applications, superconductor research (linked to a wide range of potential applications, notably room-temperature superconductivity), how different microorganisms withstand the sudden osmotic shock that comes from rainfall, performance of bacterial life at high altitudes (linked to novel transport mechanism for infectious diseases) and the search for life beyond Earth.

A small number of submissions noted that a collision with a large comet/asteroid has the potential to eradicate most life on Earth and questioned whether Irish researchers should be part of global efforts to prevent that.

There was strong interest in the exploration of space and the search for and understanding of new planets. Submissions suggested that despite its small size Ireland should: (i) position itself to play a prominent role in the rapidly evolving global space industry along with other emerging space states, to avoid losing opportunities to develop or take advantage of new technologies linked to innovations in and from space exploration; (ii) have a say in the discussion to prevent militarisation or weaponisation of space; and (iii) prevent the production of waste (junk debris) in space.

Public insight:

Another thread observed across the submissions was the need for further fundamental research with a focus on societal impact. Some submissions referred to specific disciplines and the role they can play.

'Mathematical research on the hyperbolic secant function and soliton interactions, particularly in pulse sequences. Also, metamaterials and edge/surface geometries that frustrate propagation of such waves.

Potential applications in tsunami defences, theoretical physics (wave-particle duality), fibre optics, signal processing, information density in digital communications, and engineering of non-linear systems.'

Commentary and Calls to Action

Addressing questions of a fundamental nature can lead to the most disruptive advances in our understanding of the universe, given they are unpredictable in their outcomes. New knowledge can provide a step change in application domains, as against incremental advances that may accompany targeted research questions. Curiosity-based research is a foundation of any mature research and innovation ecosystem and can be considered as an investment in the more medium to long term. It has the benefit of inspiring new generations of young people, who are inherently curious about the universe in which we live, to become the next generations of research leaders and research policymakers. Although individual fundamental research projects may focus on a small element of science or the natural world, the impact generated can have widespread societal implications. Consider, for example, artificial intelligence or quantum computing, to name but two. Hence, fundamental research should not be blithely considered as limited in its relevance to society or a luxury to be afforded elsewhere.

A number of submissions within this theme focused on space. Submissions focusing on the use of space for societal benefit were timely, especially for a small country such as Ireland which can be considered as an 'emerging space state'. Although space has previously been the preserve of large countries, much of activity is led by private companies across all scales from start-ups to multinationals and, increasingly, smaller countries.

1   Ensure curiosity-driven research is supported, not only for its potential to provide a step change in our knowledge base but also for its capacity to inspire and develop the next generation of researchers and assist in evidence-based policymaking.

2   Build on existing space research:

- Utilise the opportunities for Irish researchers in the higher-education institutions and enterprise to advance its position as an emerging space state and assist with providing solutions to societal challenges (e.g., from broadband provision to urban, rural, coastal and sea monitoring, to protection of our privacy and security of our communications).

- Protect the use of space for us all (for example, by reducing the harmful space debris in orbit which poses threats to satellites) and this will require advances across a number of technological and other domains.

Cross-cutting themes

While many threads were observed within and between the 14 themes described above, two cross-cutting themes strongly emerged from the analysis of the public submissions. They are Building Resilience and Preparedness: Insights from the Pandemic and Strengthening the Research Landscape and Public Engagement

3.2.15 | Building resilience and preparedness: insights from the pandemic

COVID-19 has been a prominent context for, and topic of, many of the submissions across all themes. Submissions note that the pandemic provides an opportunity to re-evaluate livelihoods, education, work, issues of social justice and equality as well as our climate impact. The public considered research into the acute and longer-term impact of the COVID-19 pandemic and restrictions on health, mental health, education, and child development as crucial.

The areas covered by the submissions focused on:

1   **Health impact of COVID-19**

2   **Social impact of COVID-19**

3   **Preparedness for the next pandemic**

Overall, submissions pointed to the need to develop a more complete understanding of the totality of the longer-term health, economic, and social effects of this pandemic including the broad impact of restrictions on social engagement and effects of treatment delays on chronic conditions and COVID-19-related deaths on those affected.

Public insight:

The COVID-19 pandemic has provided an opportunity for individuals and organisations to reflect and prioritise. Within the submissions there was a strong desire to learn from this pandemic and prepare for the future.

'In the context of national resilience and emergency management, I think there needs to be ongoing research on risk, vulnerability, critical infrastructure and resilience as part of the National Risk Register process. This could inform the work of the Office of Emergency Planning as well as all government departments particularly, Health, Environment, Housing, Justice, Defence, Enterprise and Education.'

Public insight:

The COVID-19 pandemic has demonstrated to the public in a tangible way the leading role research can play and should continue to play in the recovery from the pandemic. What was observed within the submissions, but not always explicitly stated, is that to achieve the solutions required challenges must be addressed in a holistic manner, and to do so multiple research disciplines need to be involved.

'Responding to COVID-19 as well as the defining existential threat of our times, climate breakdown, this all has demonstrated that what is required isn't only scientific and technological solutions, but more importantly better alignment of people's attitudes, opinions and views. More research is needed on these human factors like societal, cultural, behavioural, in order to allow us to tackle these challenges better together.'

'A national campaign to raise awareness of infectious diseases and good healthy microorganisms- how to keep the good microorganisms healthy and the bad away and treat the bad when needed. Get behavioural researchers leading this, this isn't an exercise for the lab scientists or medics to lead. Give the public a role in saving the next generation and working together to avoid outbreaks far worse than COVID-19. Make it personal to them.'

3.2.15.1 Health impacts of COVID-19

Health, including mental health and infectious diseases, has been a central feature of the submissions focused on COVID-19. Some submissions focused on the virus itself, including interventions to overcome it and the longer-term health effects of those infected. Another key area was whether the pandemic and associated social isolation have increased the prevalence of mental health problems in Ireland and the need to determine the long-term implications of such an increase. In addition, submissions sought to understand whether specific at-risk groups suffered more than others, for example, those with pre-existing mental health conditions and young children who are likely to have experienced increased anxiety and disruptions to learning and social development due to policies designed to control the spread of COVID-19.

3.2.15.2 Social impact of COVID-19

Additional points raised by the public concerned the impact of COVID-19 (both positive and negative) on education, housing, regional development, and working conditions. In the latter, submissions included: a four-day week, damage to retina from screens/home working, working conditions, remote/hybrid working, long working hours, lack of social interaction, parenting and childcare, people with disabilities.

The public noted there is significant scope for research in these areas in an Irish context, which could inform future government policies, beyond the COVID-19 response and may lead to changes in policies and how our society is organised, including how we provide education and health services, and the achievement of better work-life balance. In this regard, the public voice indicates that research should inform future policy actions here.

Moreover, some submissions noted that societal, cultural, and behavioural issues are as important as scientific and technological solutions as we seek to address both COVID-19 and the existential threat of climate change and thus advocate for more research on the human factors to tackle the challenges holistically and more effectively.

3.2.15.3 Preparedness for the next pandemic

The public noted the need to reflect on the wide-ranging effect of the COVID-19 pandemic in Ireland to help inform thinking on coping mechanisms for future disasters, both the known, e.g., antimicrobial resistance, and the unknown, e.g., future outbreaks and pandemics. Example submissions included the understanding of actual behavioural and environmental conditions to deal with future pandemics more effectively, and the potential establishment of real-time monitoring the prevalence of pathogens, microorganisms, resistant genes (e.g., in sewage plants). Many of the submissions noted the strength of Irish immunology research and highlighted the need to foster this research and connect it to the research on infectious diseases. In this context, a number of submissions advocated the establishment of a national research centre on infectious diseases.

Commentary and Calls to Action

Given this campaign was conducted during the COVID-19 pandemic, it is not surprising to see a large volume of submissions focused on this topic and the role that research can and should play in the short, medium, and long term. Emphasis from the public was particularly strong around the broad societal impact of infectious diseases. The public also identified opportunities and positive outcomes that have been identified throughout the pandemic that should shape our future going forward, far beyond this current pandemic.

1   Focus research efforts on the psychosocial impact of COVID-19 and assist with national recovery and future population resilience. Extensive research has been carried out on the mental health effects of the pandemic globally. International evidence from longitudinal research suggests that the overall impact may be small. However, in the Irish context, emerging findings from the Growing Up in Ireland (GUI) and the Irish Longitudinal Study of Ageing (TILDA)[13] point to notable increases in depressive symptoms in both younger and older age groups. Whether this is true of other age groups is unclear due to a lack of high quality nationally representative survey data on mental health across other age groups. In addition, the longer-term mental health and developmental implications of the pandemic remains an open question that needs to be examined.

2   Increase research efforts on infectious diseases and immunology taking a 'One Health' approach involving multiple disciplines and sectors with a focus on antimicrobial resistance and future pandemics. A significant level of funding in Ireland has been allocated to the bio sciences and there is also a strong industry base of research and start-up activity in this sector to build on. There are significant opportunities for cross-border collaboration here with Northern Ireland and the rest of the UK.

3   Carry out further research in an Irish context on the impact of changes in screen time on individuals' health and well-being, not only while COVID-19 restrictions were in place, but into the future as more longer-term systemic change may occur in society. Screen time exposure increased as the medium to stay socio-emotionally connected during COVID-19 lockdown measures. Irrespective of age, people relied on digital interfaces to support the remote working environment, education, entertainment, and social engagement as part of the offline to online transition. Existing evidence on the impact of homeworking during the pandemic is scant. The potential effects of remote and hybrid working may differ when there is a stronger element of choice in deciding how to balance one's worktime in the post-pandemic era.

4   Understand the long-term advantages and potential pitfalls of home and hybrid working as it is an important question both globally and within Ireland where this approach to working is currently set to become more commonplace. Research should play a role in the future of work here in Ireland.

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13 https://tilda.tcd.ie/

3.2.16 | Strengthening the research landscape and public engagement

The Creating Our Future campaign dataset provides an excellent snapshot in time of public concerns, influenced by the COVID-19 pandemic, a crisis in housing, environmental sustainability (the UN Climate Change Conference, COP-19), and the need for social inclusion.

The submissions captured these concerns, and many of them pointed to areas of research that will enable these complex and entangled issues to be resolved. There was a sense from the dataset that Ireland is not an island in tackling issues and there was a recognition of Ireland being part of an international ecosystem of research, and wanting to contribute to, and benefit from, research wherever it is taking place. In addition to the specific matters of concern, the overarching areas within public involvement in engaged research and policymaking.

The areas covered by the submissions focused on:

1. **The organisation of research in Ireland, including the research–policy interface**

2. **Public involvement in engaged research and in policymaking**

3.2.16.1 The organisation of research in Ireland, including the research–policy interface

While many submissions focused on research ideas, a significant portion of the submissions across the board referenced policy issues specifically. Many submissions referenced the need for better evidence-based policymaking, including establishing expert panels as policy informants.

In addition, one of the threads that emerged was how research itself is funded and conducted. Some expressed concerns about public value for money, with some submissions invoking particular concerns about research wastage and duplication. There were also a number of submissions that voiced concern over who is best placed to decide research foci, with some of the public regarding researchers as being the best placed to know what the focus of future Irish research might be. Submissions also called for increased interdisciplinarity in research and the need for the AHSS and the STEM research communities to work more meaningfully together.

There was also a focus on the longevity of research and ensuring that early-career researchers were able to progress through careers, avoiding academic precarity. These could be the voices of researchers themselves, but it is perhaps interesting to reflect how these concerns cut through to a wider public and might begin to influence public confidence and trust in research.

Among some submissions, there was also an awareness of what research was happening abroad (such as UK Biobank, CERN [the European Organisation for Nuclear Research], national genomics programmes) and a desire to see this replicated in Ireland. Similarly, some submissions expressed a desire to look internationally to learn from other countries' experiences whether in terms of cannabis legalisation, air quality or an ageing population.

3.2.16.2 Public involvement in engaged research and in policymaking

There were calls to ensure that communities are given the skills and voices to carry out research themselves and approaches are developed to create a better culture of engaged research with the public in Ireland.

Some submissions explicitly referenced creating better ways to access the lived expertise that people affected by health conditions can bring to research. Similar calls were evident in submissions made on education, housing, social inclusion, and referencing innovations addressing environmental sustainability

There were calls to see communication and engagement with the public improved and better dissemination of accessible research outcomes. Open access to research publications and outcomes cropped up as a frequent but specific ask here and seemed to be envisaged as having a role to play in fostering the democratisation of knowledge and research. Submissions indicate that continued support for education and public engagement activities is important.

Public insight:

The public's desire to be more involved in research and have better access to research outcomes came through in the submissions. Any existing or newly developed engaged research projects should reflect on the findings within the theme and ideas proposed by the public.

'A voluntary citizen signup (repository) of those willing to be research participants'

'Co-designing for an ageing population. Ireland has a rapidly ageing population. There is an unprecedented need to understand this phenomenon over the coming decades. Co-design and citizen science research with older populations are needed over time to create better services, products and futures for ageing populations. These may include: health service, public services, education, ageing in place (to name a few).'

Commentary and Calls to Action

1   **A focus is required on the research–policy interface**
    From these submissions one can see a desire that research should inform policy directly, and an awareness that the links between policymakers and researchers are not always necessarily straightforward. This raises a host of considerations that need attention including:

    i.   the kinds of collaborations, networks and systems needed to support research-informed, evidence-based policymaking across the board in Ireland – for example, a national science/research policy programme;

    ii. where the competencies and expertise reside and how they can be appropriately deployed and built upon; and

    iii. the infrastructure needed to support long-term, research-based policy.

2   **Focus on engaged research with the public**
    Through interpretation of the submissions received there are several areas that need to be considered for any future engaged research with the public:

    i.   A fresh look at how best to do this
    There is a significant body of research ongoing in Ireland addressing the submissions raised by the public. Enhanced communication with the public on existing research and its outcomes is required.

    While significant work is ongoing in Ireland to engage with the public, dedicated initiatives that facilitate public engagement and civic inclusion should be considered, for example through media, national and local campaigns, or raises public dialogues e.g., representative deliberative processes. Reflection on the submissions also raises questions about the kind of infrastructure that is necessary to support such public engagement.

    Some of the submissions in this theme indicated that the research community is best placed at identifying the areas for research in Ireland. This perhaps identifies that more work is needed to create a stronger sense of national public involvement in research as well as challenging assumptions about knowledge hierarchies and who should have a voice.

    ii. Focus on fundamental research
    Notably, the majority of the submissions from the public focused on areas of current public concern and there was a strong emphasis on trust in policy and decision making. With a focus on issues of immediate concern the submissions indicate that there is some understanding of applied STEM research (solving problems). However, there is limited understanding of the role of fundamental research across all disciplines, or a recognition that healthy research systems require strength and activity across the full spectrum of fundamental to applied research across all disciplines.

    iii. Focus on the research process
    In addition to focusing on the specific areas of research and research outcomes when engaging with the public and stakeholders, consideration should also be given on how best to communicate the role of research in society and the research process. An initiative with this focus included could have substantive impact, particularly among those involved in setting policy.

    iv. Learn lessons from this campaign
    More broadly there is merit in reflecting on how the public was invited to engage with this initiative. It appears the public sensed the question to mean 'What are your concerns and issues?' rather than 'What areas of research do you think Irish researchers should address over the coming years?' This has resulted in an excellent insight into the current concerns of the Irish public more than their suggestions for research, although this can at least in part be deduced. In designing any further initiatives in this area there is merit in considering the communication and invitation to the public as it strongly influences the types of inputs received.

We need a **Department of the Future**

Public insight:

The public was asked about the future as part of this national brainstorm. In the responses received, the public has challenged policy makers and the implementers of the campaign findings to do the same through research.

'I think researchers should explore how we can use Ireland as a pilot model for a regenerative society. Co-created place-based visions of regenerative futures across scale, actioned through a portfolio of connected innovation experiments aimed at intervening in systemic issues. We need a new department of the future outside of traditional government, with the mandate to imagine alternative futures.'

'What should Ireland look like in 30 years? How do we create principles out of that that will help set guidelines for all departments? I.e., All plans must fit into the goal of heading towards our future vision. Research how can we make that possible. What structures are needed. How can it be done? What controls are needed?'

'Establish an Ireland national futures institute, like they have in Denmark. [ref Copenhagen Institute for Future Studies].'

'In 30 years, what are the harms we wish we would have interrupted today that were allowed to happen?'

We have cultivated

a garden of possibility.

You can only see what you illuminate.

4 / Recommendations

When the Creating Our Future portal closed on 30 November 2021, 18,062 valid submissions had been received from the public.

The submissions, captured at a moment in time, express people's immediate concerns, their priorities for the future, as well as their ideas and insights about how research can scaffold the future they desire. The vision of the future conveyed in the submissions is values-led with a strong commitment to justice and inclusion. Moreover, it expresses a confidence that research can be a vehicle for social transformation.

Given the level of engagement in this campaign and the volume of submissions received, this serves as a good indication that the public has faith in research, in its capacity to advance individual and societal well-being and to prepare us for the unprecedented challenges ahead.

The Irish public's response to the COVID-19 pandemic, specifically the exceptionally high uptake of vaccination and adherence to public health advice, confirms this confidence in research and its outcomes. Within the submissions themselves, and given the wide-ranging ideas received, this belief that research can contribute to a better future runs across all domains and includes all research subjects. The submissions highlight the value of a long-term, integrated, future-oriented research policy as well as the importance of research-informed policy development.

To deliver on the opportunities captured through the Creating Our Future campaign the Expert Committee has identified two sets of recommendations:

- **The first set of five recommendations** are areas research should initially explore based on the 16 themes and calls to action identified by the public and should be implemented immediately. They are directed at government and the research community. More detailed calls to action from the public are available in Chapter 3 which provide additional context and further areas for research requiring attention.

- **The second set of six recommendations** are directed at government and focus on systemic, long-term actions that are essential to enable the research system in Ireland to deliver on the calls to action from the public.

Everything is connected. We want clarity but we also know that everything is connected and entangled.

SCAFFOLD THE FUTURE SCAFFOLD THE FUTURE SCAFFOLD THE FUTURE SCAFFOLD THE FUTURE

Sometimes, in order to inhabit the future, it helps to have a framework or indeed a mental model of how the decisions we make today might play out over time.

In the absence of certainty, we reach for proxy constructs that offer us just enough clarity to act.

Scaffolding is building a temporary structure that exists for a period of time, allowing the more permanent structure to grow up around it... It offers a framework to inhabit the future and seed it with possibility.

In time it will become obsolete as the more permanent elements become established. It can be disassembled at this point; however, evidence of its influence will persist in the 'DNA' of the future.

4.1 Areas for research to explore

1 Solutions for the future cannot be developed in silos – everything is connected. Researchers should explore ways to live within our planetary boundaries with integrated sustainable solutions.

Many of the submissions received from the public recognise that the challenges to be addressed require systemic and holistic actions if they are to be overcome. Across many of the themes described in Chapter 3, a continuous thread observed was the need to develop sustainable lifestyle solutions for the future based on a common agenda. These ranged from sustainable fashion and finance to transport, agriculture and housing.

To avoid the unforeseen consequences of siloed thinking and of failing to adequately understand the interactions between different sectors, holistic perspectives on sustainability should be developed and should inform the scope and objectives of research projects and funding programmes in Ireland.

2 Accelerated research efforts are required in mental health and infectious diseases to improve quality of life and strengthen Ireland's resilience in the face of future disruptions.

Mental health was a key area of concern for the Irish public, with calls for a greater emphasis on early intervention and early detection, for additional services delivered in the community, and for a more compassionate, sophisticated, and nuanced understanding of mental health and well-being. Irish research on mental health would greatly benefit from the development of a coordinated, national effort involving multiple disciplines and stakeholders to address the complex issues of mental health, including the socio-economic determinants, to ensure population resilience in the face of future threats.

There should be a complementary initiative to co-ordinate, optimise, and build upon infectious diseases and immunology research across the island of Ireland. A stronger cohort of talent, involving multiple disciplines and stakeholders, which is sustainably supported into the future, is required to deal with existing and new infectious disease threats locally, nationally, and globally. This needs to take a 'One Health' approach, given the entangled nature of the health and well-being of humans, animals, and the environment.

3 Researchers should design, implement, and evaluate bespoke Irish solutions for services and infrastructure (from housing to transport and energy). These efforts should account for our unique geography, society, and heritage so that they benefit all.

Ireland's infrastructural challenges are distinct, and efforts to address these will benefit from greater attention to the local and national context when developing bespoke solutions.

This is particularly relevant to the challenges of housing, transport, and energy, etc., identified by the public. There is a strong public appetite for involvement in designing context-specific solutions across Ireland, and this will require a common understanding of requirements and feasibility from all stakeholders involved. Research should play a leading role in these endeavours, but an enhanced and coordinated national approach to research policy and funding will be required in this area if solutions are to be developed, implemented, and evaluated.

4 Irish research needs to be at the cutting edge of emerging digital technologies that improve people's lives, increase public trust, and make for a more inclusive and fair society.

Consideration should be given as to how Irish research expertise can be enhanced for Ireland to become a world leader in digital transformation. Specific areas of importance for the public, in both emerging and existing technologies, include digital health and well-being and its impact, and how digital technologies can contribute to governance and policymaking for efficient decision-making and greater transparency. This is of particular importance to Ireland given the strong presence of leading technology companies and the growing risks to health and democracy presented by unethical and untrustworthy practices in the digital world.

5 Research is required to harness the power of communities to generate local and systemic change in Ireland (from green initiatives to education and the future of work).

Consideration should be given as to how Ireland's research community can engage with, and harness the power of, communities within existing and future research projects. As observed across many of the themes, Ireland has long-held strengths and a large culture around communities, volunteering, and supporting one another, and these are attributes that the public believe need to be built upon. Now it is time to harness the power of communities in the research conducted and implemented in Ireland. Real and sustained change at local, regional, or national level will only be achieved through engaging with and activating communities, whether it is through green initiatives, education, or the future of work the public want the opportunity to be part of these endeavours.

4.2 Strengthen the research system to deliver

Informed by the submissions and the analysis of the seven working groups, the Expert Committee has identified six key cross cutting recommendations that require immediate action to enable research to deliver on the expectations of the people of Ireland more effectively, as communicated through the Creating Our Future campaign.

To deliver on the public's confidence in, and high expectations of, research, the Expert Committee recommends that government work with others to:

1 Ensure an inclusive research system in Ireland with fresh initiatives for engaged research with the public.[14]

Existing initiatives to engage the public in research, through publicly engaged research as well as through research communication and education have garnered significant benefits, for research and for the public. However, a step change is now required, in both the nature and scale of these initiatives. Fresh initiatives to promote public engagement with and understanding of research will need to be designed and implemented as well as building on existing ones that play an important role. It was evident from the submissions that the public want to engage further and the research community should respond.

The initiatives will need to:

- incentivise co-created programmes of research with the public;

- communicate the nature of research and the research process as well as accessible research outcomes;

- communicate more effectively the contribution of fundamental research and research in AHSS in addressing societal challenges;

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14 https://www.campusengage.ie/wp-content/uploads/2020/11/Campus-Engage-Policy-Brief-Senior-Civil-Servants-and-Policy-Makers-in-Government.pdf

The best way to invest in the future,

invest in the humans
who will inhabit it.

- develop new research engagement programmes based on models of inclusive participatory and deliberative democracy;

- support an open access policy to encourage dissemination of research results.

2 Invest in multidisciplinary, transdisciplinary, and interdisciplinary research.

The complexity and entangled nature of the challenges we face and those identified by the public require holistic and innovative responses based on research. This will require continued support for discipline-based research and significant enhancement of capacity for multidisciplinary, transdisciplinary, and interdisciplinary research.

It is essential that in any new strategy advances are in made in STEAM (science, technology, engineering, arts, and mathematics) research and not STEM alone as the arts, humanities, and social sciences play a vital role in enabling systemic change and societal growth.

The increased capacity for interdisciplinary and transdisciplinary research will require investment in educational programmes to develop interdisciplinary capacity in the researcher pipeline, support for the development of interdisciplinary research networks and consortia. There is opportunity to explore ways of funding networks and consortia to capitalise on the breadth of research expertise across the country.

3 Create the architecture to support the research–policy interface.[15]

To achieve the ambitions within the public submissions, the interface between research and public policymaking should be significantly developed in Ireland. If policymaking is to benefit from Ireland's investment in research, mechanisms are required to facilitate dialogue, increase access to evidence, and provide a greater understanding to policymakers of the research process that provides this knowledge and evidence now and in the future.

It is also critical that researchers better understand the policymaking process, the evidence required, and ensure effective ways of communicating it.

This will entail the development and implementation of a framework for research–policy engagement at multiple levels. It will also require leadership from the research community, government departments and research funders.

4 Establish an independent Research Advisory Council.

There is an opportunity and need to create a structure that will provide independent, cross-sectoral, multidisciplinary advice to government in support of the national strategy for research, innovation, science, and technology which also includes AHSS. Ireland is unusual among its European partners in not having such a structure, although the form this takes varies across the different jurisdictions.

Work to develop the proposals for the remit, structure and membership of a research advisory council should commence immediately. The council should have a remit to provide independent advice on national research policy across all fields, which would include the development of the research–policy interface (see Recommendation 3 above).

5 Capitalise on existing Irish sectoral strengths in research, development, and innovation across the regions.

A strong and vibrant regional research and innovation ecosystem is an enabler of economic and social opportunity and a vehicle for local, rural, and regional development. It also plays an important role in reducing the systemic economic and social disadvantage that persists in some regions and makes them more resilient in the face of external influences. The public also identified through the submissions that they believe research must play a key role here too.

Despite advances in recent years, the untapped potential of each region's research–enterprise–community interface has yet to be realised.

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15 https://www.ria.ie/sites/default/files/research-for-public-polciy-report-2021_1.pdf.

The foundations are now in place to capitalise on existing regional strengths through new and ambitious forms of collaboration between higher education institutions, enterprise, and local communities. This will enable the cross-pollination of ideas and talent across the sectors to deliver integrated and holistic solutions to current and future challenges for maximum public benefit.

6. Future-proof Ireland by investing in a vibrant research system.

Research excellence is the cornerstone of a strong, mature, and impactful research system. Research excellence is seeded, nurtured, and amplified by investing in talent across all disciplines, supporting fundamental and applied research, building, multidisciplinary, transdisciplinary, and interdisciplinary research networks, and educating future research leaders. A resilient research system is necessarily embedded in a strong higher education sector, connected to a dynamic innovation sector.

Long-term research policy decisions in the 1990s[16] laid the ground for a major transformation of the research landscape of Ireland. The scale and complexity of the challenges we currently face require a similarly ambitious, long-term policy and investment.

By ensuring Ireland has a vibrant research system, the research system will provide the expertise and international connectivity to ensure Ireland can respond effectively as a country, no matter what disruptions occur. However, with current levels of investment, any new explorations cannot be undertaken without displacing existing ones. If we want to have the kind of research excellence that the public expects and be prepared to respond to future shocks and disruptions, now is the time to increase the level of investment in Irish research, with the support from the public.

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16 https://enterprise.gov.ie/en/Publications/Publication-files/Forfás/Science-Technology-and-Innovation-Advisory-Council-Report.pdf

The Inheritance Project

What would we send into the future to be there when we arrive?

Appendices

Appendix A

Expert Committee and Working Groups

Expert Committee and Roles

Prof. Linda Hogan, Trinity College Dublin (Chair Expert Committee)

Prof. Jose Bengoechea, Queen's University Belfast (Chair Working Group A)

Prof. David Farrell, University College Dublin (Chair Working Group C)

Dr Orla Flynn, Atlantic Technological University (Chair Working Group B)

Prof. Anita Maguire, University College Cork (Chair Working Group E)

Prof. Brian Norton, International Energy Research Centre, Tyndall National Institute & Technological University Dublin (Chair Working Group D)

Ms Lorna Ross, VHI Health & Well-being (Design Research Team Lead)

Dr Niall Smith, Munster Technological University (Stakeholder Relations Lead)

Prof. Barry Smyth, University College Dublin (Data Analytics Team Lead)

Multidisciplinary Working Group Membership

A: Health and Well-being

Dr Sara Burke, Trinity College Dublin

Dr Marica Cassarino, University College Cork

Dr Michael Daly, Maynooth University

Dr Richard Gorman, University of Sussex

Ms Lorna Kerin, Royal College of Surgeons in Ireland

Dr Ali Khashan, University College Cork

Prof. Fiona Lyng, Technological University Dublin

Dr Darragh McGee, University of Bath

Dr Aisling Murray, Economic and Social Research Institute

Ms Gillian O'Shea, Janssen Sciences Ireland

Prof. Neil Rowan, Technological University of the Shannon: Midlands Midwest

Dr Lisa Ryan, Atlantic Technological University

Ms Karen Tierney, SilverCloud Health

Prof. John Wells, South East Technological University

B: Education, Social Issues, and Social Rights

Dr Yekaterina Chzhen, Trinity College Dublin

Dr Dáithí Downey, Dublin City Council

Dr Anne Graham Cagney, South East Technological University

Dr Jo-Hanna Ivers, Trinity College Dublin

Dr Stephen Lucek, University College Dublin

Dr Bertrand Maître, Economic and Social Research Institute

Prof. Orla Muldoon, University of Limerick

Dr Áine Ni Léime, National University of Ireland, Galway

Prof. Michelle Norris, University College Dublin

Dr Katriona O'Sullivan, Maynooth University

Dr Trevor Vaugh, Maynooth University

C: Arts and Culture, Communities and Societies, Communication/Media, and Politics

Dr Eileen Culloty, Dublin City University

Ms Cliona Curley, CyberSafeKids

Dr Kelly Fitzgerald, University College Dublin

Ms Courtney Helen Grile, Trinity College Dublin

Ms Alison Harvey, The Heritage Council

Ms Liz Kennedy, Technological University of the Shannon: Midlands Midwest

Dr Orla Lynch, University College Cork

Dr Niamh Maguire, South East Technological University

Dr Niamh McCrea, South East Technological University

Prof. Cathal O'Donoghue, National University of Ireland, Galway

Dr John Pender, Atlantic Technological University

Prof. Maria Pramaggiore, Maynooth University

Prof. Colin Scott, University College Dublin

Ms Helen Shaw, Athena Media

Ms Rosie Webb, Limerick City and County Council

D: Green and the environment

Dr Caterina Brandoni, Ulster University

Ms Jean Cahill, Technological University Dublin

Ms Caroline Engel Purcell, Carrig

Dr Kevin Grecksch, University of Oxford

Ms Emer Keaveney, ORCA and Munster Technological University

Dr Rosanna Kleemann, University College Dublin

Mr Vincent McCormack, GKinetic Energy Ltd

Prof. Aonghus McNabola, Trinity College Dublin

Ms Rosemarie McSweeney, Irish Green Building Council

Dr Jean O'Dwyer, University College Cork

Dr Noreen O'Meara, University of Surrey

Prof. Peter Robertson, Queen's University Belfast

Dr Niamh Shaw, Dream Big

Prof. Derek Sinnott, South East Technological University

E: Economies, Industrialisation, Innovation, Research (Role of Research, Research System, Research Community, and Technology

Ms Alex Cooney, CyberSafeKids

Dr Eoin Cullina, Atlantic Technological University

Dr Felicity Kelliher, South East Technological University

Mr John McGrane, The British Irish Chamber of Commerce

Prof. Abhay Pandit, National University of Ireland, Galway

Prof. Roger Whatmore, Imperial College London

Dr Adam Whittle, Commission for Communications Regulation

Dr Sally Zhu, University of Sheffield

Data Analytics Team

Dr Derek Greene, University College Dublin (Lead Data Analyst)

The Expert Committee and campaign programme leads consulted with the below on the development of their methodology:

· Dr Gregory Absillis, Research Foundation Flanders
· Dr Haithem Afli, Munster Technological University
· Dr Pauline Cullen, Maynooth University
· Dr Thomas Feliciani, University College Dublin
· Dr Conor Hayes, National University of Ireland, Galway
· Dr Tinne Jacobs, Research Foundation Flanders
· Mr Séamus Lankford, Munster Technological University
· Dr Pablo Lucas, University College Dublin
· Dr Junwen Luo, University College Dublin
· Mr Michiel Nuytemans, Tree Company
· Prof. Sara O'Sullivan, University College Dublin

Design Research Team

Ms Leslie Ruckman, Independent Designer and Researcher, New York

Dr Josina Vink, Oslo School of Architecture and Design, Norway

Ethical advice

Ms Elizabeth Noonan, the National Forum Research Ethics Committee Chair
and University College Cork

Expert Committee Campaign Programme Team

Mr Dónal Browne, Havas Ireland

Dr Peter Clifford, Science Foundation Ireland

Dr Lisa Higgins, Science Foundation Ireland

Ms Ruth Kelly, Science Foundation Ireland

Ms Jennifer Kenneally, Royal Irish Academy

Dr Niall McEvoy, Science Foundation Ireland

Mr Luke Molloy, Science Foundation Ireland

Ms Laura Pielaszkiewicz, Science Foundation Ireland

Ms Mary Teehan, Science Foundation Ireland

Mr Akid Zolkifli, Havas Ireland

Support from Dr Ben Bleasdale, Campaign for Science and Engineering, UK

Appendix B

Detailed methodology

Aim: to analyse and interpret the submissions from the public into a set of findings, reflective of the public's voice and based on these findings, develop key recommendations inspiring future research in Ireland.

Objective: the objectives of the study were to conduct a multi-pronged, mixed methodology analysis, using both technology-driven and manual approaches, ensuring the submissions were explored and interpreted using multiple lenses.

Process and implementation: The Expert Committee developed a comprehensive and holistic seven-step framework and established seven diverse working groups: a data analytics team, five multidisciplinary working groups, and a design research team with varied expertise and a range of experiences, at different career stages, and from across the public sector (largely, the higher education institutions), enterprise, and the not-for-profit sector in Ireland and internationally. All groups conducted offline and group analysis and participated in virtual group meetings throughout December 2021 and January 2022 to discuss and refine their work. The Expert Committee then brought together the outputs from all groups into a single set of findings (Chapter 3) and recommendations (Chapter 4). The Expert Committee received ethical advice on the analysis, which verified it was adhering to good ethical standards and best practice.

Data included:

Over the course of the campaign [31 July 2021–30 November 2021] 18,462 submissions were received from the public. Submissions were collected using a website, an online platform that collected real-time feedback from users during dedicated events and in the form of written submissions on a postcard at workshops, roadshow events and through postal submissions. An individual could submit as many ideas as they wished.

To maximise engagement from the public, there was only one mandatory entry field (420 characters maximum) where the question posed to the public was:

'Tell us your idea for what researchers in Ireland should explore to create a better future.'

Your idea could be based on:

- *a challenge or opportunity you see for yourself, your community, Ireland, or the world;*

- *a topic you are curious or passionate about and would like researchers to explore.*
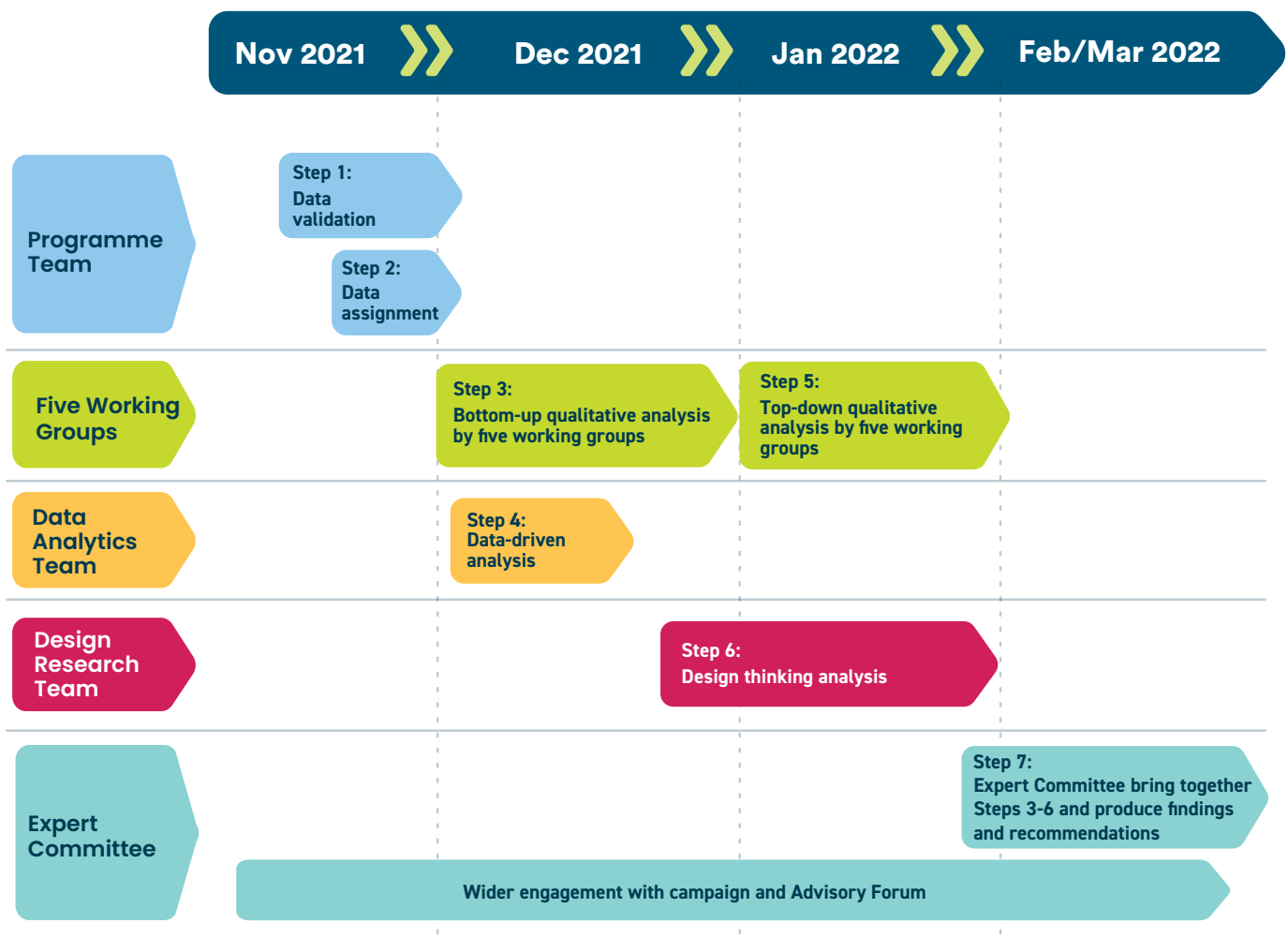
Two optional fields corresponding to the submission idea that the public could provide, and that the analysis included were:

- Location [the 26 counties and other] and;
- age range [16-19; 20-29; 30-39; 40-49; 50-59; 60-69; 70-79; 80-89; 90+].

Other information captured in the dataset and used for analysis purposes were the date and time of submission entry. No other information gathered as part of the campaign was included in the analysis dataset or provided to the Expert Committee and their associated working groups.

Data cleaning was conducted prior to the analysis. This included the removal of any personally identifiable information, any offensive or bad language, or names of people referred to in the body of the submission idea. All submissions made in a language other than English were translated into English. They remained in the original submitted language and English for the manual interpretation of the working groups, but only the English translations were included in the technical analysis.

Figure 3: Detailed Seven-step Framework

Nov 2021 ≫ Dec 2021 ≫ Jan 2022 ≫ Feb/Mar 2022

Programme Team
Step 1: Data validation
Step 2: Data assignment

Five Working Groups
Step 3: Bottom-up qualitative analysis by five working groups
Step 5: Top-down qualitative analysis by five working groups

Data Analytics Team
Step 4: Data-driven analysis

Design Research Team
Step 6: Design thinking analysis

Expert Committee
Step 7: Expert Committee bring together Steps 3-6 and produce findings and recommendations
Wider engagement with campaign and Advisory Forum

Step 1: Validation of submissions

In principle, submissions were valid until proven otherwise, but there were seven reasons why a submission was deemed invalid for this analysis (see table below).

Invalid submission	Reasoning
A. Repeat lobbying submissions	If the same submission text was submitted multiple times within a given time frame and it was evident to be the same submitter, only one submission remained valid.
	For some repeated submissions it was not possible to determine if these were submitted by the same individual, due to the limited data being collected. In these instances, the submission remained valid and was included in the analysis. As this analysis took many different approaches and applied different lenses, the risks associated with repeat submissions receiving undue consideration were mitigated.
B. Incomprehensible gibberish	Nonsensical, no logic or idea derived.
C. Offensive or aggressive attacks	If a valid idea was included, the offensive or aggressive text was removed.
D. Non-constructive criticism	If a valid idea was included, the non-constructive criticism text was removed.
E. Facetious	If a valid idea was included, the facetious text was removed.
F. No idea present	If no idea or topic was present in the submission.
G. Operational feedback	If submissions related to the campaign itself and how it was conducted, they were not included in the analysis of ideas, but the inputs were still captured and could be used for other purposes.

The data validation process was conducted by the programme team within the campaign supporting the Expert Committee that met regularly to discuss and agree approaches and decisions made. Out of the 18,462 submissions received, 18,062 submissions (97.8%) were deemed valid for inclusion in this analysis.

Step 2: Submission assignment

The fully validated submission dataset was provided to the design team (to conduct Step 6) and technical analysis data team (to conduct Step 4).

The data was assigned to the five working groups in two different ways:

- Firstly, it was manually assigned (Step 2) by the programme team within the campaign supporting the Expert Committee to one or more of the five groups depending on the remit of the submission only.

- Secondly, the outputs of the technical analysis (Step 4) were assigned to the five working groups.

This ensured the data was analysed by various experts in diverse ways using multiple lenses, and so the findings would be as comprehensive as possible given the timeline and resources available.

The programme team who manually assigned the submissions to working groups met regularly to discuss and agree approaches and kept a log of decisions made. This was to ensure a consistent approach was implemented as much as possible.

The five working groups were manually allocated a batch of submissions depending on the remit of the submissions. Each submission went to at least one working group; some went to more than one if the submission contained more than one idea or if the idea was cross-cutting in nature to span the remit of more than one group. The number of submissions that went to each working group varied.

Step 3: Bottom-up qualitiative analysis

Within the working groups, every single submission included in the analysis was read by members of the group. Submissions were randomly distributed within the working groups to ensure fresh and diverse perspectives on the submissions. While the groups conducted their bottom-up qualitative analysis of the manually assigned data (Step 2), they became accustomed to the nature of the submissions and then captured qualitative narrative and case studies on their emerging findings such as, themes, threads, innovative or unique ideas, key opportunities for Ireland, key areas identified by the public, and sentiment. This also included identifying important areas that were outliers i.e., ideas that were important to reflect on but that were not well represented in the overall submission dataset. This step was a vital element within the framework to ensure all 18,062 voices were given due consideration.

This in-depth and comprehensive work was conducted by the working groups throughout December offline and in smaller subgroups created within the working groups and then weekly meetings were held by each of the five working groups to discuss their progress and emerging findings.

Step 4: Data-driven analysis

A high-level analysis of submissions received was conducted to get an overview of the submissions. This included a breakdown of:

- submission length mean/median (mean=158.2 median=89 characters) and number of words mean/median (mean=25.2 median=14). 40.5% of submissions contain 10 or fewer words).

- number of submissions over time

- number of valid submissions per county (including adjusted for the county population size) and by age group, for the submissions that had this optional data associated with it (78.9% and 59.3% respectively)

To support the manual inspection of ideas in Step 5 and to allocate the submissions in a different way than Step 2 to the five working groups, a data-driven analysis was conducted to identify common themes and groupings of ideas and to identify the key concepts expressed within these themes.

The objective of the technical analysis phase was to use state-of-the-art natural language processing and machine learning techniques to identify recurring patterns (words, common phrases, concepts, and ideas) within the submissions. This approach described below was applied to all valid submissions (18,062) after the removal of invalid submissions.

There were two key outcomes from this analysis:

1. A clustering of submissions into a coherent set of topical clusters so that similar ideas could be grouped together.

2. Generating a ranked set of words to reflect the key concepts expressed by the ideas in a particular group.

This led to the identification of five primary topics and 30 secondary topics. The secondary topics, their top terms, and the number of submissions per topic are shown in Table 1, while the hierarchical relationship between the primary and secondary topics is shown in Figure 4.

Irish-language submissions (n=269) were translated into English, and this translation was used to automatically classify each one with respect to the secondary topics identified for the English submissions. In this way the Irish language submissions were incorporated into the above topical clustering.

A detailed description of each phase of this approach is provided below.

Word clouds were produced for each of the secondary topics which provided one type of overview and demonstrated some of the heterogeneity within the secondary topics. They therefore acted as supporting tools only for analysis in Step 5.

Step 5: Top-down qualitative analysis

This step was the qualitative and human interpretation of the computer supported analysis in Step 4. It was agreed for the purpose of Step 5 that the primary topics should not be the focus as the secondary topics were more meaningful. As a result, the 30 secondary topics were allocated across the five working groups for the second round of qualitative analysis on the submission data, this time taking a top-down approach. Of the 30 secondary topics, 28 were allocated to one of the five groups and two were split and allocated to two of the five groups. These were then assigned to the working group that they were most closely aligned with. They were then allocated to smaller groups within each of the working groups to conduct their detailed analysis. To note: there were significant differences in the dataset reviewed by each group in Step 3 versus Step 5; this was done deliberately so that the submissions were considered from as many diverse perspectives as feasible. The differences in overlap varied between each secondary topic.

Group members worked within their group to analyse their allocated secondary topics and produce qualitative narrative alongside each. As well as providing an overview of key themes and threads within the secondary topic, information was also gathered from the members' knowledge of the existing research landscape in Ireland and internationally in these spaces, and observations for the future, any potential gaps, and how research and engagement can contribute to the public's submissions in this space. It is important to note that if it were identified that existing research has already been conducted in a particular area, it did not result in the omission of any ideas submitted or reduce their relative importance in the findings; rather it could inform potential future actions.

This work was conducted throughout January offline and in smaller subgroups created within the working groups, and then weekly meetings were held by each of the five working groups to discuss their progress and emerging findings.

Step 6: Design thinking analysis

In parallel to the five working groups' analysis, a design research team was established to analyse and interpret the submissions from a completely unique perspective and therefore provide an additional lens on the submissions.

Many of the ethnographic research methods used in design to understand people's behaviours can also be used to speculate more generally on the future. This was particularly relevant to this study as the question posed to the public was about 'creating a better future.' Design is also, to a large degree, about empathy and imagining another person's experience. The aim was to identify a proxy voice for the 18,062 people so that aspects of the report were about them and not just the words they used. The analysis was focused on storytelling and identifying the emotive aspect of the submissions; put very simply, it was to illuminate both the hopes and the fears people were sharing.

The question posed to the public, the potential factors that influenced participants when making submissions, and the corresponding nature of the actual submissions received were interrogated and reflected on. This was done from a design and human perspective at two levels:

- A collective high level by zooming out and looking in, synthesising the data not so much as 18,062 isolated submissions, but as the collective consciousness of the country, at a particular moment in time, accounting for the behavioural, social, cultural, and environmental drivers.

- Reinhabited at an individual level by zooming in and looking out. Working backwards, it was imagined what the proposition of future-gazing might have been like for the 18,062 people who contributed.

Following this, insights, key ideas, and considerations were captured, and corresponding narratives and illustrations were generated.

This work was conducted offline individually and through group virtual meetings throughout December and finalised by the Expert Committee throughout February and March.

Step 7: Expert Committee Combine Findings and Produce Recommendations

From January until March, the Expert Committee brought all the outputs from the seven groups together into one set of findings, identifying overlaps in themes and threads between them (see Chapter 3), ensuring the narrative was a synthesis of the voice of Ireland and, as much as possible, portrayed an honest reflection of the submissions received from the public. Building on the discussions and outputs of the working groups, the Expert Committee then developed commentary and the list of calls to actions for future research based on the submissions from the public. This included the expert perspective on how research and the research community could contribute to the themes outlined in the findings from the public. The Expert Committee also identified public insights to be highlighted as exemplars in the report and illustrations to be showcased throughout. The Expert Committee then developed their recommendations for research to deliver on the expectations of the people of Ireland more effectively, as communicated through the Creating Our Future campaign.

Note: The findings were brought together into one set of themes. It does not mean that this is the only way that the clustering could have been done based on the analysis but doing so in some way facilitated presenting the findings.

Engagement with the Campaign Advisory Forum:

In parallel to the analysis work of the Expert Committee, ongoing dialogue was maintained with the Advisory Forum and the Advisory Forum Subcommittee. This work was led by Dr Niall Smith who was designated as the Expert Committee Liaison with the Advisory Forum and its subcommittee. Meetings took place between October 2021 and March 2022.

The focus of the first stage engagement was for the Expert Committee to hear about the campaign from the perspective of the Advisory Forum and to understand their priorities and the focus of their work, with the intention of informing the plans of, and the methodology to be used by, the Expert Committee.

The second stage of engagement placed an emphasis on sharing details of the methodology implemented, communicating the emerging findings, providing opportunity for discussion and, importantly, gaining insights from the Advisory Forum Subcommittee with their knowledge of the campaign journey. This helped to inform the presentation of the findings in the Expert Committee report, thereby ensuring the views expressed by the Advisory Forum were visibly accounted for.

Additional information on the data-driven analysis (Step 4):

Approach

Phase 1: Data Filtering

- Initial input was the final set of submissions (n=18,462). The submissions that were manually flagged as 'invalid' (n=400) were removed.

- This resulted in 17,747 out of 18,416 submissions (96.37%) as the English language corpus *S1* for text analysis. (Phase 2 & 3) and 315 submissions for the S2 text analysis (Phase 4).

Phase 2: Data Pre-processing

- The following steps were applied to the texts in *S1*:
  - Converted text to lowercase and normalised white space
  - Removed URLs from the text
  - Applied tokenisation and lemmatisation to the text
  - Removed stop-words from a list of 435 common English words
  - Applied log-based TF-IDF (Term Frequency Inverse Document Frequency) weighting and L2 unit-length normalisation to the document vectors
  - The output was a document-term matrix X1, with a vocabulary of 6,949 unique words.

Phase 3: Topic Modelling

- **A: Secondary Topic Generation**
  - Non-negative matrix factorisation (NMF) with Non-Negative Double Singular Value Decomposition (NNDSVD)-based initialisation was applied to X1. After a range of automated and manual inspection was performed, 30 granular topics were identified. These are referred to as secondary topics.
  - It was agreed that submissions should not be directed into a topic if not appropriate. Therefore, outlier submissions with low weights with respect to all 30 secondary topics (weight threshold=0.005) were then identified.

- In total, 1,662 outliers (9.36%) were removed from consideration, leaving a subset S1' and corresponding matrix X1'.

- Having removed outliers, the secondary topics were refined by applying NMF to X1', using the 30 topics from the original run to initialise the process. This yielded a final set of secondary topics.

- Each secondary topic is represented by its descriptor (i.e., the top 10 highest-weighted words for each topic). See Table 1.

- Each of the submissions in S1' was then assigned to the secondary topic for which it had the highest weight.

- **B: Primary Topic Generation**
  - To generate more high-level primary topics, the secondary topics generated in Step A were clustered.
  - Specifically, complete-linkage agglomerative hierarchical clustering was applied to the basis vectors produced by NMF in Step A, using Pearson correlation as the distance function. This produced a tree or dendrogram of secondary topics. See Figure 4.
  - Following manual inspection of the original data and the tree, the tree was cut to produce five flat clusters, each of which consisted of numerous secondary topics. These correspond to the primary topics.
  - Descriptors for the primary topics were produced by averaging the basis vectors for the corresponding assigned secondary topics produced in Step A. See Table 1.
  - Using the mapping of secondary topics to primary topics, and the assignment of submissions to secondary topics in Phase 2, all submissions were subsequently assigned in S1' to a primary topic.

- The main output of this phase was a set of primary and secondary topic annotations for 17,747 of the English language submissions in *S1'*. Descriptors for the primary and secondary topics were also produced.

Phase 4: Irish-language Analysis

- All Irish-language submissions were manually translated into English, giving a set *S2* of 269 translated submissions. An additional 46 English submissions were included in the analysis to produce a final *S2* dataset of 315 submissions.

- *S2* was mapped to the existing 30 secondary topic annotations as follows:

  - Applied the same pre-processing steps to the texts in S2, as applied above for the original English language submissions S1, to produce a Term Frequency Inverse Document Frequency (TF-IDF)-weighted bag-of-words representation X2. Note that this representation has the same vocabulary as X1.

  - Trained a Linear Support Vector Machine (SVM) classifier on the pre-processed 17,747 English language submissions, using the secondary topic annotations as the target label, with a One-Versus-All multiclass strategy.

  - Predicted target labels (i.e., secondary topics) for the translated submissions represented by X2, using the trained SVM classifier.

- Primary topic annotations were then assigned to the submissions in *S2*, based on their secondary topic and the hierarchy generated in Phase 3.

Figure 4:

A dendrogram illustrating the hierarchical clustering of 30 secondary topics into a set of five high-level primary topics. The final cluster assignment is indicated by the colours of the secondary topic names on the left-hand side.
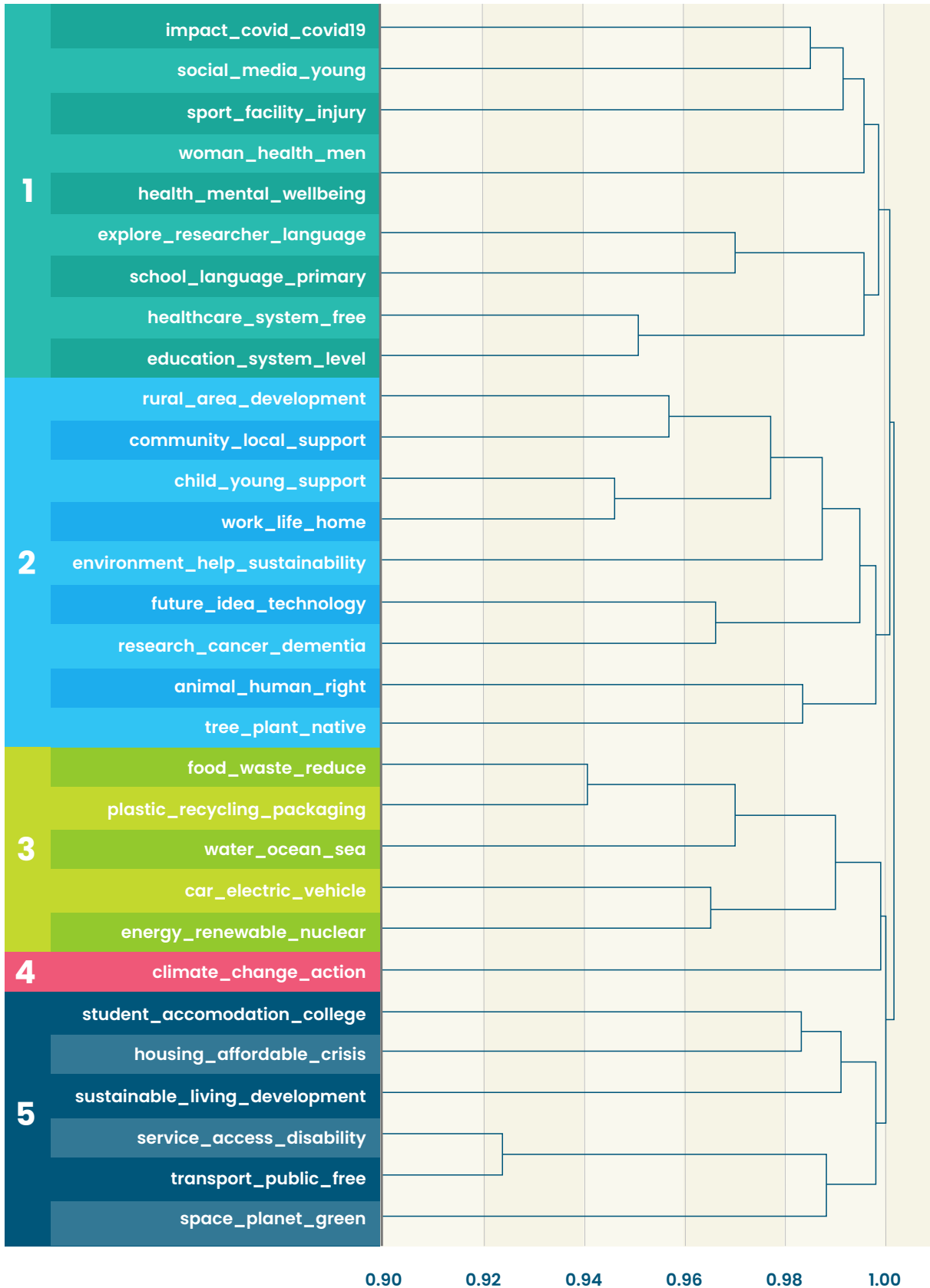
Table 1:

List of 30 secondary topics, including their topic descriptors (i.e., top 10 words), and the total number of submissions assigned to each topic. Topics are ordered by number of submissions.

Secondary Topic	Top 10 Words	Number of submissions
work_life_home	work, life, home, working, day, week, balance, living, time, live	1,219
rural_area_ development	rural, area, development, town, city, urban, local, facility, green, planning	891
research_cancer_dementia	research, cancer, dementia, cure, disease, funding, treatment, policy, science, time	779
explore_ researcher_ language	explore, researcher, language, dementia, benefit, help, country, disease, technology, treatment	759
energy_renewable_nuclear	energy, renewable, nuclear, green, source, wind, power, solar, wave, fuel	712
health_mental_ well-being	health, mental, well-being, issue, awareness, physical, care, youth, young, affect	708
service_access_ disability	service, access, disability, public, support, improve, care, older, hospital, health	697
water_ocean_sea	water, ocean, sea, pollution, quality, system, clean, river, waste, air	684
child_young_ support	child, young, support, parent, family, adult, care, age, disability, help	675
impact_covid_ covid19	impact, covid, covid19, well-being, society, pandemic, positive, environmental, negative, vaccine	643
education_system_level	education, system, level, access, learning, free, inclusive, technology, sex, higher	619
housing_ affordable_crisis	housing, affordable, crisis, homeless, house, price, home, problem, cost, rent	583
climate_change_ action	climate, change, action, behaviour, solution, crisis, biodiversity, sustainability, help, adaptation	566
sport_facility_ injury	sport, facility, injury, affect, participation, girl, gender, female, activity, teenager	563
animal_human_ right	animal, human, right, welfare, extinct, protect, cruelty, farm, wildlife, nature	553
future_idea_ technology	future, idea, technology, generation, world, planet, flying, past, litter, medicine	523
plastic_recycling_packaging	plastic, recycling, packaging, waste, reduce, alternative, single, bottle, product, material	499

Secondary Topic	Top 10 Words	Number of submissions
school_language_primary	school, language, primary, secondary, teacher, class, curriculum, kid, teaching, subject	498
student_ accommodation_ college	student, accommodation, college, level, support, affordable, cheaper, leaving, cert, living	489
car_electric_ vehicle	car, electric, vehicle, road, solar, hydrogen, fuel, charging, reduce, battery	486
transport_public_ free	transport, public, free, bus, cost, dublin, train, infrastructure, route, engagement	470
woman_health_ men	woman, health, men, menopause, endometriosis, issue, clot, blood, pill, workplace	387
environment_ help_ sustainability	environment, help, sustainability, recycling, awareness, agriculture, protect, biodiversity, improve, litter	378
community_ local_support	community, local, support, group, centre, engagement, older, building, involvement, art	353
space_planet_ green	space, planet, green, living, travel, exploration, outdoor, public, city, outer	332
food_waste_ reduce	food, waste, reduce, production, homeless, produce, organic, diet, packaging, carbon	312
health-care_ system_free	healthcare, system, free, care, elderly, hospital, worker, patient, access, transgender	280
tree_plant_native	tree, plant, native, planting, grow, garden, based, help, carbon, growth	273
sustainable_living_development	sustainable, living, development, farming, resource, agriculture, source, making, production, society	241
social_media_ young	social, media, young, inclusion, addiction, development, society, negative, behaviour, policy	206

Appendix C

High-level information on submissions received

The submission collection campaign ran from 31 July 2021 to 30 November 2021. Over this time a total of 18,062 valid submissions were collected.

Figure 5
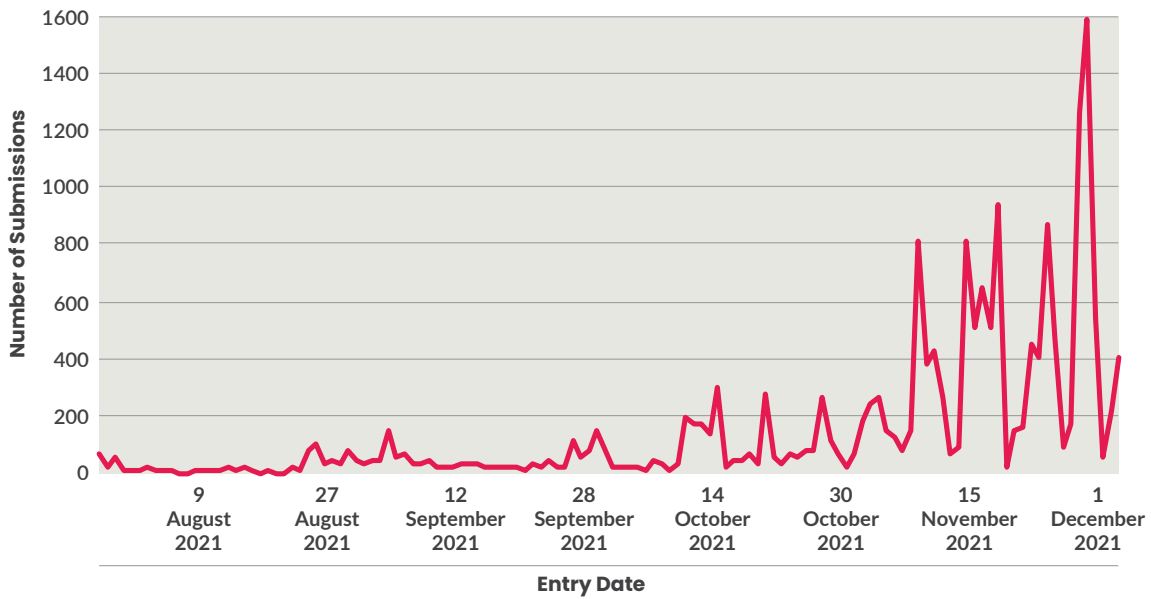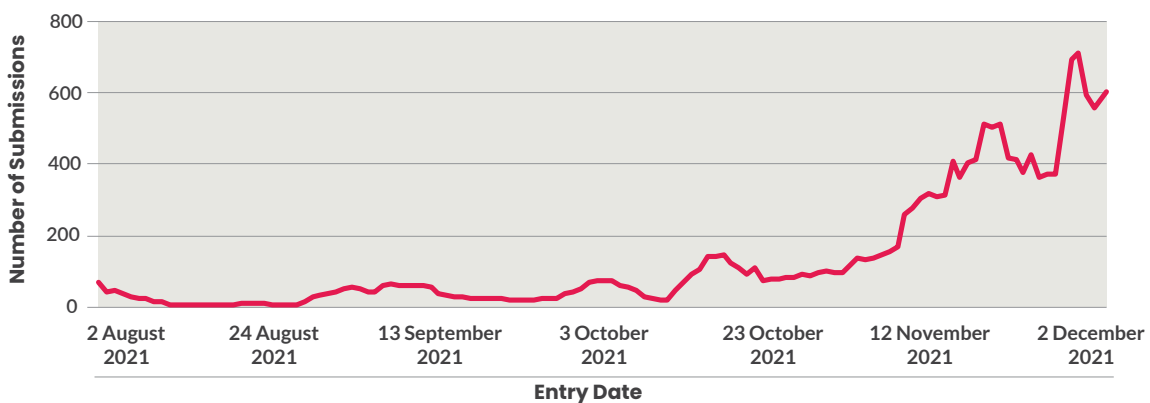
Number of submissions over time based on 'Entry Date' field.

Figure 6

**Number of submissions over time (seven-day rolling average) based on 'Entry Date' field.**

Submission text lengths

The maximum possible length of submissions made through the campaign website was 420 characters. Distribution of length of filtered submission texts, based on number of characters: mean = 158.2, median = 89 characters.

Distribution of submission lengths in number of characters
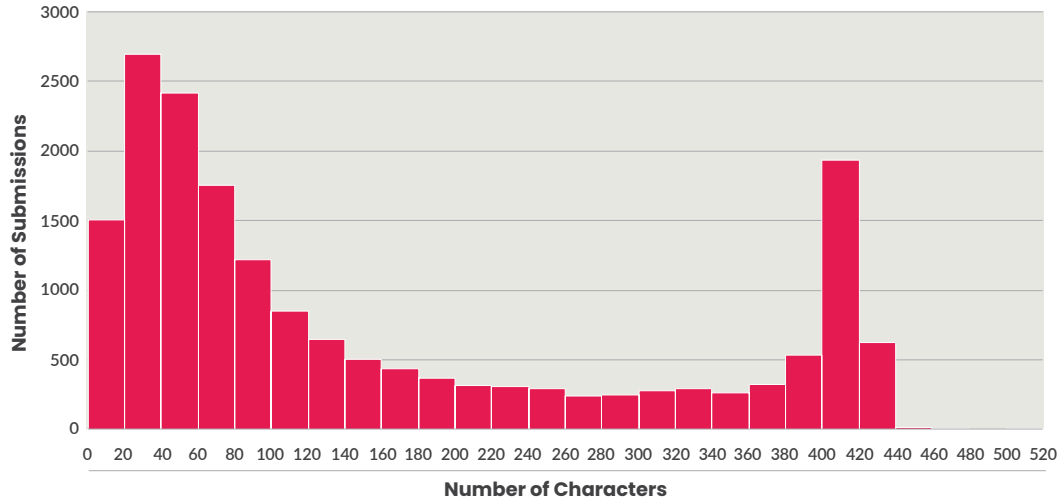
The number of words per submission: mean = 25.2, median = 14. A substantial proportion of submissions (41%) contain 10 or fewer words.
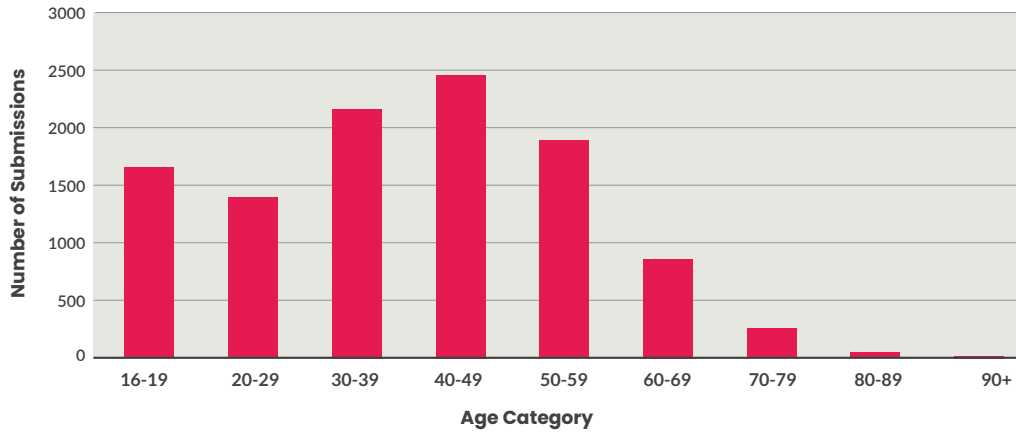
Distribution of submission lengths in number of words
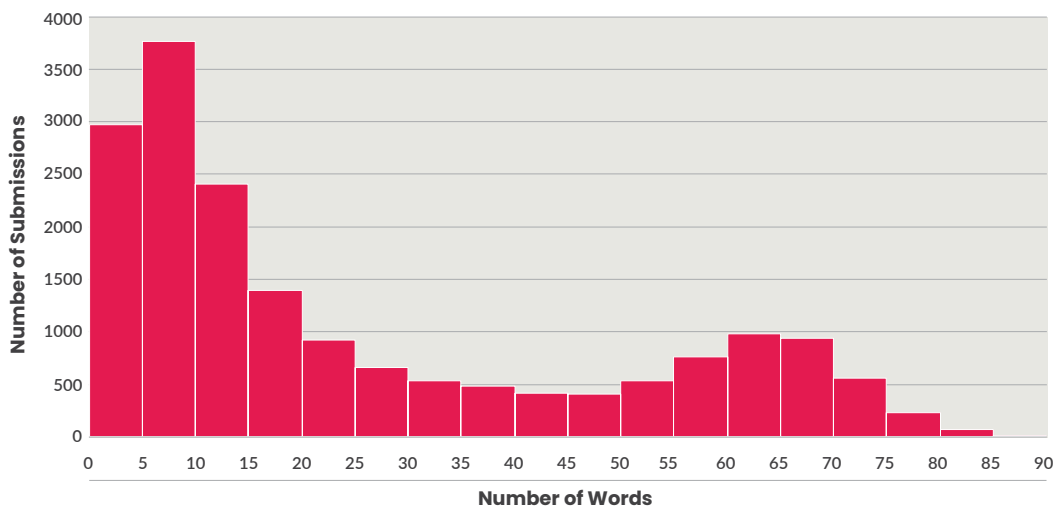
Age range

Age information was collected for 59.3% of valid submissions (10,705/18,062).

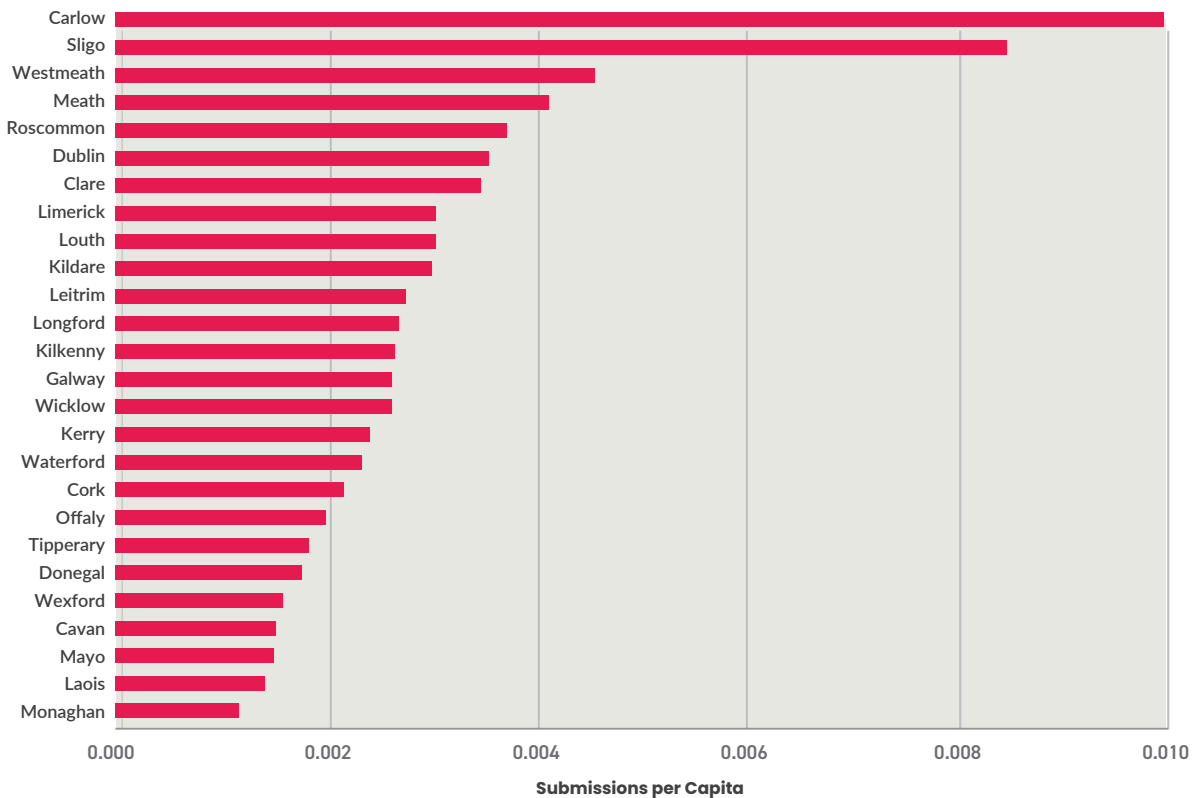**Number of submissions by age category**

Location

Location information was collected for 78.9% of valid submissions (14,247/18,062).

While Dublin was the county that provided the largest number of submissions, five other counties provided more submissions per capita.

Number of submissions by location (per capita)