INSTITUTE OF
HEALTHCARE ENGINEERING

UCL

AGE INNOVATION HUB
2021 PILOT REPORT

INTRODUCTION

Healthy ageing is a priority area for funding bodies, NHS and the government. As part of the Industrial Strategy Challenge Fund, UKRI has committed £98 million for innovation projects that improve older life. In line with these developments, UCL Institute of Health-care Engineering (UCL IHE) has identified healthy ageing as a strategic focus.

The Age Innovation Hub pilot built on a history of UCL IHE's activity in this area, including a successful Healthy Ageing Symposium in February 2019, which allowed the Institute to identify key challenge areas, draw together a community of UCL experts, and engage with external partners that could help deliver this campaign in charity, clinical, government and industry sectors.

The motivation behind the Age Innovation Hub was to invite input from individuals with lived experience of these challenges, with the aim to tap into valuable ideas and insights from potential end users who are often excluded from the development process. The campaign asked the public what needs and challenges they had around healthy ageing, and what ideas they had for technologies that could help this.

Everyone was welcome to contribute, but two key audience groups were identified:

i) Elderly community members, families, neighbours, and older patients.

ii) Healthcare professional who haven't previously engaged with research such as nurses, professional carers, occupational therapists, physiotherapists, and GPs.

The original plan was to combine online engagement with in-person community facilitation sessions with charity and community partners, but due to the Covid-19 pandemic, which arrived in the UK in early 2020, in-person outreach was no longer possible. The Age Innovation Hub pilot was therefore launched solely as a digital platform in February 2021, using the Crowdicity idea management software, with the aim to enable online crowdsourcing of ideas and provide a pipeline to support their refinement and development.

To reach the target audiences, an integrated marketing campaign was designed which included social media, mailing lists, partnering with charities, community groups, professional bodies and GP networks. A paid digital advertising campaign using LinkedIn, Facebook and Fendix (NHS intranet) expanded the public outreach further.

This report presents a qualitative and quantitative analysis of user demographics and engagement data collected through the Age Innovation Hub, with the aim to:

i) Identify the most popular themes and opportunities.

ii) Evaluate how successful the Age Innovation was in achieving its aims.

iii) Assess whether the used platform was an effective public engagement tool for the purpose it served.

USER DEMOGRAPHICS AND ENGAGEMENT ANALYSIS

The vast majority of the public users who created an account on the Age Innovation Hub were based in the UK (N=105), a small number of public users was based abroad (N=16).

In addition, there were some participants who had admin (N=12) or moderator (N=8) roles. Admin users managed the operational logistics of the online platform and were either support team members from the UCL IHE, or employees of Crowdicity, the online platform software provider. Participants with a moderator role had been recruited by the Age Innovation Hub support team from a pool of early career researchers in different disciplines who were based at the UCL IHE. They were paid for 10 hours a week to actively engage with the different challenge areas on the Age Innovation Hub, respond to user posts, and ensure a general respectful and constructive engagement with the platform.

Figure 1 shows an overview of the user demographics and content engagement analysis. Only public users were incorporated in the demographic data, to accurately reflect public engagement with the Age Innovation Hub. However, since moderators were encouraged to actively engage with the platform, their input is also reflected in the engagement data for each of the six challenge areas.

Table 1 presents an overview of the available demographic data that was visualised in Figure 1.

As already mentioned above, most public participants in the Age Innovation Hub were based in the UK. What furthermore stands out is that about half of these participants

lived in London, a likely reflection of active engagement of local networks and partners connected to the UCL IHE. The age distribution of public users was fairly evenly spread across different age brackets from 18 to 75, with a peak in the age bracket 55-65 and dropping off steeply above 75 years of age. More than half (55) of the public participants had no healthcare profession, compared to 34 who did. Of 32 participants it was unknown whether they had a profession. There was no information available on gender or ethnic group.

Table 2 presents an overview of the user engagement with the six challenge areas that was visualised in Figure 1.
The challenge area 'Staying Independent for Longer' was engaged with the most by all users (public users and moderators combined), followed by 'Staying Active'.

In the next section 'Thematic Content Analysis', differences between public users' and moderators' input to the different challenge areas, and the recurring themes that arose from the posted ideas and comments, are further delineated.

FIGURE 1: AGE INNOVATION HUB USER DEMOGRAPHICS AND GLOBAL DATA ANALYSIS
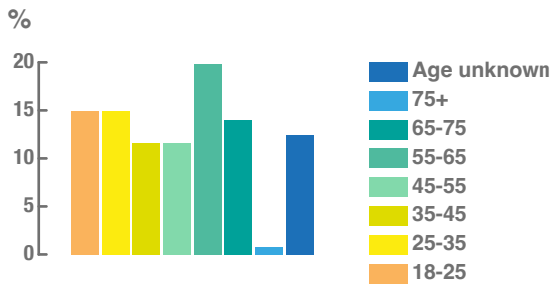
AGE INNOVATION HUB
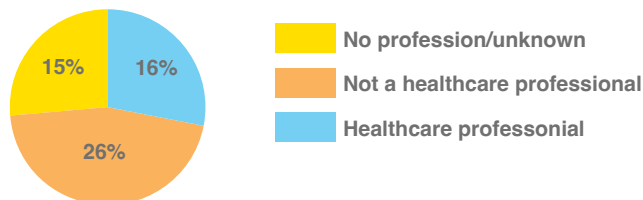## USER DEMOGRAPHICS AND GLOBAL DATA ANALYSIS

105 USERS IN THE UK

5
Scotland

1
Northern
Ireland

2
North West

1
Wales

2
West

7
South West

6
North East

9
East

57
London

15
South East

16 GLOBAL USERS

AGE OF USERS

%

- Age unknown
- 75+
- 65-75
- 55-65
- 45-55
- 35-45
- 25-35
- 18-25

PROFESSION OF USERS

15%   16%

26%

- No profession/unknown
- Not a healthcare professional
- Healthcare professonial

USER ENGAGEMENT WITH THE SIX CHALLENGE AREAS

Ideas   Comments   Votes   Participants

BUILDING SOCIAL COMMUNITIES

73   9

28   22

CREATING HEALTHY ENVIRONMENTS

8   37

20   17

STAYING INDEPENDENT FOR LONGER

14   66

54   34

SUPPORT FOR HEALTH CONCERNS COMMON WITH AGE

8   60

20   18

STAYING ACTIVE

10   67

18   18

THE BIGGER PICTURE

10   36

18   18

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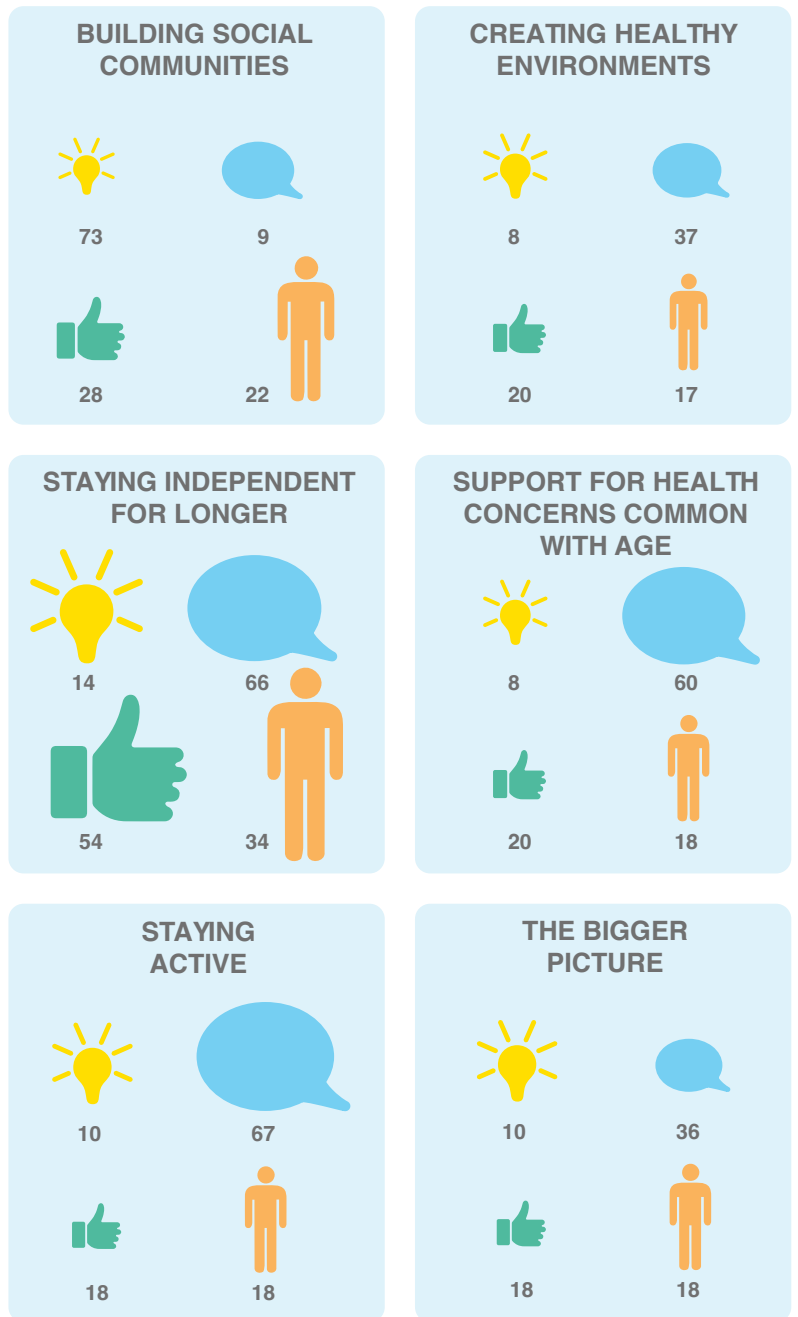
TABLE 1: AGE INNOVATION HUB USER DEMOGRAPHICS DATA

GEOGRAPHICAL DISTRIBUTION	NUMBER OF PUBLIC USERS
United Kingdom	105
East of England	9
London	57
Northeast England	6
Northwest England	2
Northern Ireland	1
Scotland	5
Southeast England	15
Southwest England	7
Wales	1
West England	2
Global	16
Total	**121**
AGE DISTRIBUTION	NUMBER OF PUBLIC USERS
18-25	18
25-35	18
35-45	14
45-55	14
55-65	24
65-75	17
75+	1
Unknown	15
HEALTH CARE PROFESSIONAL DISTRIBUTION	NUMBER OF PUBLIC USERS
No	55
Yes	34
Unknown	32

TABLE 2: USER ENGAGEMENT WITH THE SIX CHALLENGE AREAS

CHALLENGE AREA	IDEAS	VOTES	COMMENTS	PARTICIPANTS
Building Social Communities	7	28	39	22
Creating Healthy Environments	8	20	37	17
Staying Active	10	18	67	18
Staying Independent for Longer	14	54	66	34
Supporting People with Health Concerns Common with Age	8	20	60	18
The Bigger Picture	10	18	36	18

THEMATIC CONTENT ANALYSIS

For the thematic content analysis, printouts of the user engagement (ideas, comments, and votes) with the Age Innovation Hub for each of the six challenge areas were exported from the Crowdicity platform.

These exported word documents contained a lot of personal data in the form of full names/usernames, email addresses and portrait pictures (if users had uploaded these), which means they can't be reproduced here for GDPR reasons.
A database has been created alongside this report which contains the anonymised content of the posted ideas per challenge area, classified by contributor (public user versus moderator), and accompanied by the number of comments and votes, as well as the thematic coding results.

A qualitative analysis of the posted ideas and comments in each challenge area was conducted to identify and code recurring themes (the overarching topic of the idea) across the six challenge areas.
Alongside recurring themes, which were given T codes, suggested support areas (which were often examples of potential practical applications of healthy ageing strategies and/or technologies) and target audiences were also identified and coded (S and A codes). Ideas could be allocated multiple T, S and A codes.

Table 3 shows the results of this analysis, whereby the most prevalent recurring themes, suggested support areas, and target audiences are ranked from high to low based on the prevalence of the different codes allocated to posts across the six challenge areas.
The column on the right shows the relative contribution of public users versus moderators.

As Table 3 shows, the balance often tipped towards being either driven more by public users, or moderators (who were all early career researchers at the UCL IHE).
In assessing the contributor ratios, it should be kept in mind that while moderators only made up a small proportion (6%) of the total number of participants in the Age Innovation Hub Pilot, they contributed almost half of the ideas: 27 out of a total of 57 (47%).

TABLE 3: USER ENGAGEMENT WITH THE SIX CHALLENGE AREAS

Recurring themes (T)	T Codes	Prevalence (%)	Public User/Moderator Ratio
Assistive technology	T03	25.6	12/8
Communication technology	T01	12.8	7/3
Healthy ageing strategies	T08	11.5	2/7
Bodily functions and mobility	T10	10.3	2/6
Urban design	T06	9.0	3/4
Healthcare technology	T05	6.4	4/1
Music technology	T02	5.1	4/0
Wearable technology	T12	5.1	4/0
Community activities/services	T04	3.8	2/1
Product design	T09	3.8	1/2
Interior design	T07	3.8	2/1
Navigation technology	T11	2.6	1/1
Support area suggestions (S)	**S Codes**	**Prevalence (%)**	**Public User/Moderator Ratio**
Physical activity	S10	13.5	1/11
Digital inclusion	S06	12.4	8/3
Cognitive impairment/dementia	S04	7.9	5/2
Fall prevention	S08	7.9	3/4
Mental health	S12	6.7	3/3
Social networks	S05	6.7	4/2
Daily activities	S14	5.6	3/2
Medication compliance	S09	5.6	4/1
Autonomy	S15	5.6	3/2
Physical disability/illness	S02	5.6	4/1
Quality of life	S17	5.6	1/4
Hearing difficulties	S11	3.4	1/2
Biostats	S18	2.2	1/1
Gardening	S13	2.2	1/1
Arts activities	S20	2.2	1/1
Personal safety	S16	2.2	2/0
Healthy diet	S01	1.1	1/0
Inoculation	S19	1.1	1/0
Breathing difficulties	S03	1.1	1/0
Daily papers access	S07	1.1	1/0
Target audiences (A)	**A Codes**	**Prevalence (%)**	**Public User/Moderator Ratio**
Older people	A01	73.7	30/15
General	A04	19.7	2/10
Carers	A02	4.9	1/2
Clinicians	A03	1.7	1/0

The content of ideas varied widely, as participants were invited to share any thoughts that they felt might be relevant to the topic of healthy ageing. In the Excel database, under the tab 'Ideas and Engagement Ranking' the submitted ideas have been coded (IC) and grouped by contributor. The number of comments and votes on each idea are shown in separate columns. The votes were cast anonymous however, so information on voter demographics and distribution could not be extracted.

Assistive technology was a recurring theme that was brought up most often by both public users and moderators. This was in relation to a broad variety of suggested support areas, such as physical activity, fall prevention, digital inclusion, cognitive impairment/dementia, social networks, medication compliance, everyday activities and biostats (e.g idea codes IC10, IC26, IC27, IC33, IC38, IC41).

There was one specific innovation suggestion posted by a healthcare professional (IC03), which regarded a microphone for Non-Invasive Ventilation (NIV) masks, so that elderly patients can hear and understand the healthcare professionals whilst having their therapy, rather than taking the mask off to communicate and therefore losing the benefits of the mask.

Some public users posted a research survey/recruitment request (e.g. IC40) and a couple of entrepreneurs pitched their products and/or services, which were either already in use, or fully formed and tested ideas (e.g. IC04, IC48).

A few public users shared personal experiences or conversations they had with carers and/or patients on their everyday experiences relating to ageing and the (technological) obstacles they might face (e.g. IC30 and IC31).

Public users raised concerns across multiple challenge areas about the difficulties that older adults often have with operating and accessing technology, which will have likely been brought to the fore during to the Covid-19 pandemic (e.g. IC24, IC28, IC29, IC37, IC51).

On the other hand, it stood out that 9 out of the 10 ideas put forward under the challenge area 'Staying Active' were submitted by the moderators (e.g. IC20, IC22, IC23), which was also reflected in the fact that the most prevalent suggested support area 'Physical activity' (S10) was almost entirely driven by moderators (see Table 3).

PLATFORM EVALUATION

Given the fact that the age distribution of public users showed balanced involvement of both young and older adults, it can be assumed that the platform was broadly accessible, at least to digitally savvy users.

A salient detail is that public participants in the Age Innovation Hub could not tell which users were moderators, as this information was not made public when a user posted an idea or a comment. Moderators were the most active commentators, often responding to ideas posted by public users to ask prob-ing questions or give context to a subject, but as far as the public users could tell, the moderators were just very active participants in the Age Innovation Hub.

From a data collection perspective, the platform proved to be not very accommodating. The user experience design seemed to be clearly orientated towards forum-style interactions, with minimal structure and data segmentation. The lack of focus on the data collection format was most apparent in the way in which the platform content was exported: in the form of dressed-down html copies of webpages, pasted into word documents. This made the data analysis unnecessarily cumbersome, as all the content had to be extracted and categorised manually. It also meant that personal data was very difficult to filter out of the data exports, as usernames, email addresses and profile pictures were embedded in each post, instead of listed in separable columns.

While qualitative analysis software packages such as NVivo can accommodate a wide variety of data sources, data segmentation will always benefit any analysis, and this is an area where Crowdicity could improve on.

CONCLUSION AND FUTURE DIRECTIONS

The objective of the Age Innovation Hub Pilot to engage the two key audiences it had identified was partly successfully delivered on. The qualitative and quantitative data analysis showed participation from over a hundred public users with ages ranging from 18 to 75+, with a peak in users in the 55-65 age bracket who are likely to become increasingly aware of the value of healthy ageing strategies and innovations.

The most recurring theme brought up by both public users and moderators was the potential of assistive technology in ageing, and a broad range of possible applications was suggested. Many of the ideas and comments related to the lack of user-friendliness and accessibility of technology for older people, especially those with physical and/or cognitive impairments. This could potentially become a focus area for the UCL IHE. The second key audience, healthcare professionals, represented 28% of the registered public users, contributing 9 out of the 57 ideas (16%).

The user demographic data did not detail in which challenge areas users had contributed ideas, so the specific distribution was unknown. Only one idea, which was put forward under the challenge area 'Building Social Communities' could be clearly identified as coming from a healthcare professional perspective (IC03). In this respect, the Age Innovation Hub Pilot might not have been as successful in engaging healthcare professionals as originally envisioned.

The chosen platform, Crowdicity, might have also played a role in the limited effectiveness of the Age Innovation Hub to gain novel insights and ideas for technology innovations that could support healthy ageing. The user experience design was tailored to free-text forum interactions, and did not require participants to specify and/or categorise their ideas, which were often quite general statements without an obvious angle where the UCL IHE could offer a solution (e.g. Zoom is not easily accessible to digitally illiterate older people). The early-career UCL IHE researchers that had been recruited as moderators were instructed to engage with public users and ask clarifying questions, but the analysis showed that an unintended result of their high level of interaction with the platform was that they ended up contributing a disproportionate number of the ideas and comments, compared to public users. The fact that public users could not identify which users were moderators could have had an effect on the platform engagement dynamics as well, but that can't be assessed properly without conducting interviews and/or surveys with public users on their experiences of participating in the Age Innovation Hub.

In conclusion, the Age Innovation Hub Pilot succeeded in engaging a broad range of participants, but it appeared to try to do too many things at the same time. Going forward, it is advisable to set out a clearer vision of what kind of public engagement is sought and to what purpose, and then design a public campaign and platform around that. Legal concerns such as shared intellectual property rights will also need to be addressed in advance, in case a co-creative design process is envisioned.

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