I'm a Scientist,
Get me out of here:

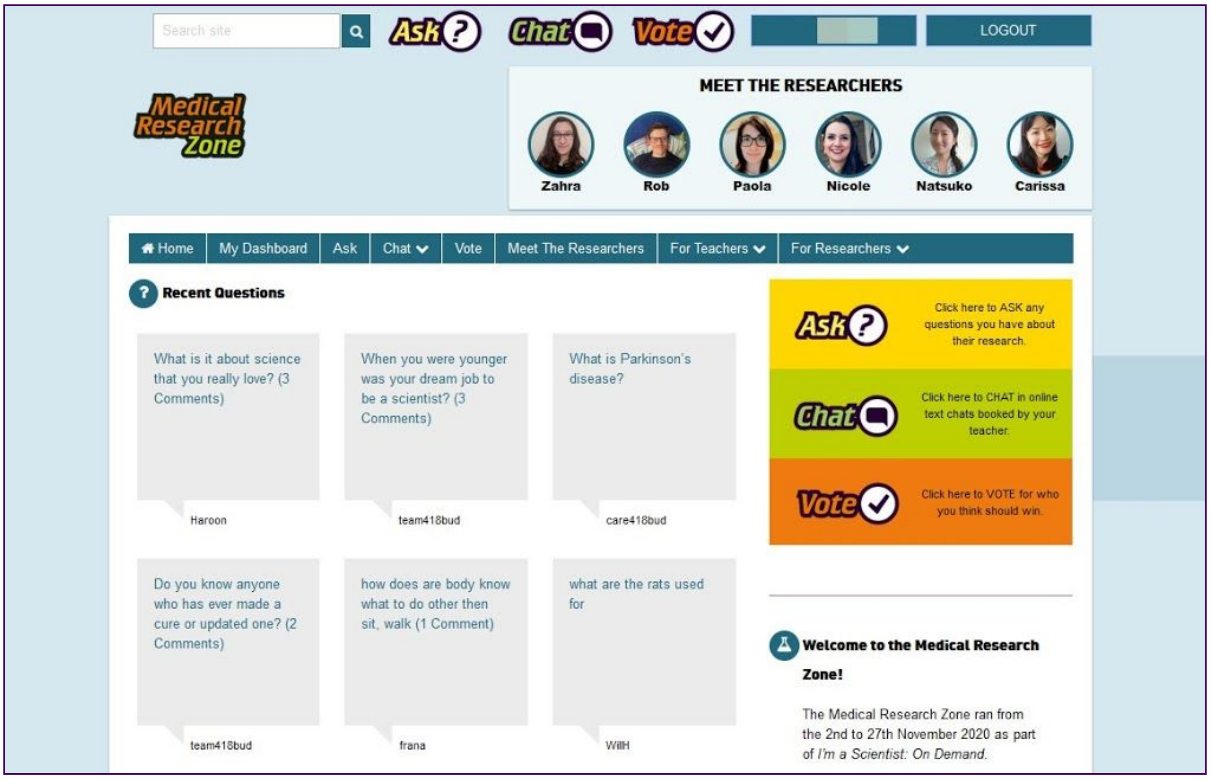
2018–20 MRC Zones Evaluation Report

December 2020

Mangorolla CIC

UKRI Medical Research Council

Background



I'm a Scientist, Get me out of here **(IAS, imascientist.org.uk) is an online, student-led, public engagement project that gives school students across the UK real interactions with scientists and other STEM professionals.**

Scientists create profiles on the website and engage directly with school students through answering posted questions, and in real-time, text-based chats. Students ask questions about whatever they want; questions about careers, research, as well as their wider interests and lives outside of work.

Through taking part, students engage with STEM professionals from a diverse range of backgrounds, disciplines, and industries. They get to see scientists as ordinary people with hobbies, interests, pets, and families. They learn about STEM careers and opportunities in higher education, while seeing how what they learn in school relates to the world around them.

Between 2018 and 2020 the Medical Research Council (MRC, mrc.ukri.org) funded 5 IAS zones to engage students with MRC research. This report is a summary of the activity in, and an evaluation of, the impact of those zones.

Contents

Summary

- **We ran 5 zones between June 2018 and November 2020**

- **5,335 students logged in with 80% actively engaging:**
  - Students from 141 schools took part.
  - 59% of participating schools were widening participation or in underserved areas.

- **226 researchers took part:**
  - Scientists represented a wide range of areas within medical research, and showed students a wide range of backgrounds, careers, and routes into STEM.

- **Every school live chat included a discussion around medical research; at least 59% of live chat conversations included medical research topics:**
  - Additionally, 41% of questions in 'Ask', and 57% of answers from researchers included discussions related to medical research themes.

- **Taking part in IAS supports students' science capital:**
  - Research carried out in 2019 into the impact of taking part in IAS shows that IAS maps well onto the Science Capital Teaching Approach, supporting science capital dimensions including: *science literacy*, *seeing science as relevant to everyday life*, *knowledge about the transferability of science/science qualifications*, and especially, *knowing people in science-related jobs.*

- **Taking part has a positive impact on MRC researchers:**
  - MRC researchers reported increased skills (91%), confidence (86%), and enthusiasm (88%) for communicating research with lay people.
  - 82% increased their understanding of young people's views on medical research.
  - 86% increased their interest in taking part in future public engagement activities.
  - 41% reported benefits to their profile as a researcher, and 40% reported benefits to their professional reputation.

- **IAS is different to other engagement projects MRC researchers have taken part in:**
  - IAS is easy to participate in; it fits around schedules, there is no need to leave the office, lab, or home.
  - Pseudo-anonymity encourages a broader range of students to actively engage and ask questions.
  - Student-led discussions allow for a greater depth of engagement.

Participants and activity

Summary of activity

Between 2018 and 2020 we ran zones funded by the MRC across 5 events:

- **June 2018 MRC Festival Zone:** mrcfestival2018.imascientist.org.uk/
  Run over 4 weeks as part of the 2018 *MRC Festival of Medical Research*
- **June 2019 MRC Festival Zone:** mrcfestival2019.imascientist.org.uk/
  Run over 4 weeks as part of the 2019 *MRC Festival of Medical Research*
- **March 2020 Medical Research Zone:** mrc2020.imascientist.org.uk/
  Run over 4 weeks
- **Summer (April–July) 2020 Medical Research Zone:** medical20.imascientist.org.uk/
  Run over 12 weeks as part of the 2020 *I'm a Scientist, Stay at home* event
- **November 2020 Medical Research Zone:** mrcmedical2020.imascientist.org.uk/
  Run over 4 weeks as part of the 2020 *I'm a Scientist, On Demand* event

	Total	Average per event (Excl. summer 2020)	Summer 2020[1]
Researchers[2]	226	31	114
Schools[3]	141	27	53
Students logged in	5,335	1,022	1,248
Active students[4]	80%	87%	51%
Live chats	303	53	91
Lines of live chat	110,508	21,276	25,404
Ask questions asked	2,867	650	266
Ask questions approved	1,718	372	229
Ask answers given	6,139	1,376	636
Votes	3,173	629	623

[1] Summer 2020 numbers shown separately; this ran over 12 weeks while all others ran over 4.
[2] 226 researchers took part in the zones. 13 researchers took part on multiple occasions.
[3] Students from 141 schools took part in the zones. 21 schools took part in multiple events.
[4] % of students who actively engaged through asking a question, taking part in a live chat, casting a vote, or posting a comment.

Zone reports

For each zone, zone reports comprise summary activity data, examples of good engagement, and preliminary feedback.

These are published following each event and are available online: https://about.imascientist.org.uk/category/zone-reports/mrc/

Participating schools

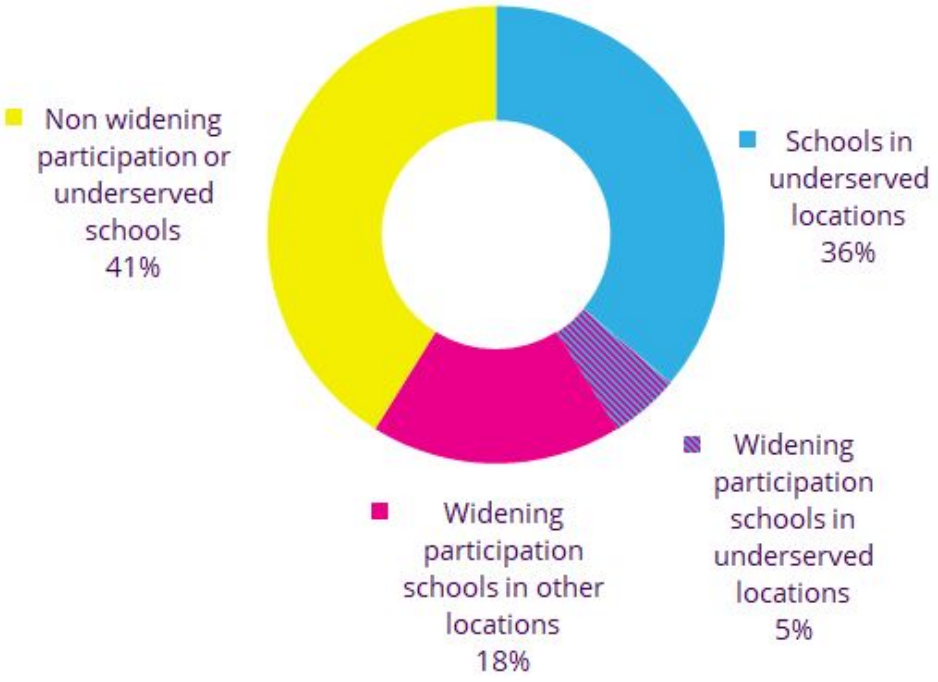
5,335 students from 141 different schools logged in over the different events, with 80% actively engaging through joining a discussion, asking a question, posting a comment, or casting a vote.

The map (right) shows the locations of participating schools across the UK.

Underserved and widening participation schools

We work to prioritise places for schools in geographically underserved areas and widening participation schools.[5]

59% (83/141) of the participating schools were underserved or widening participation schools.



41% (58/141) of participating schools were located more than 30 minutes from a major research HEI (underserved locations). Our research shows that these schools are half as likely to get a visit from a university scientist than schools within 15 minutes of a HEI.[6] Taking part in IAS gives students at these schools — which may be less accessible to traditional engagement activities — access to researchers and other scientists.

23% (32/141) of participating schools were widening participation schools.

In the most recent event (November 2020), 80% of actively participating students came from an underserved or widening participation school.

[5] Widening participation schools are counted as those with above average percentage of students eligible for free school meals (currently more than 14%); or in Scotland, where more than 20% of pupils live in the 20% most deprived datazones. Underserved schools are those more than 30 minutes drive from a major research HEI. Read more: about.imascientist.org.uk/under-served-and-wp/

[6] about.imascientist.org.uk/2017/school-engagement-in-stem-enrichment-effect-of-school-location/

Participating researchers

In total, 226 researchers actively participated in the zones, with 13 participating in 2 events each.

In the 2018, 2019, March and November 2020 events, all participating researchers were affiliated with the MRC. The 2020 Stay at home event was open to a wider range of researchers; 66 actively engaging participants were affiliated with the MRC.

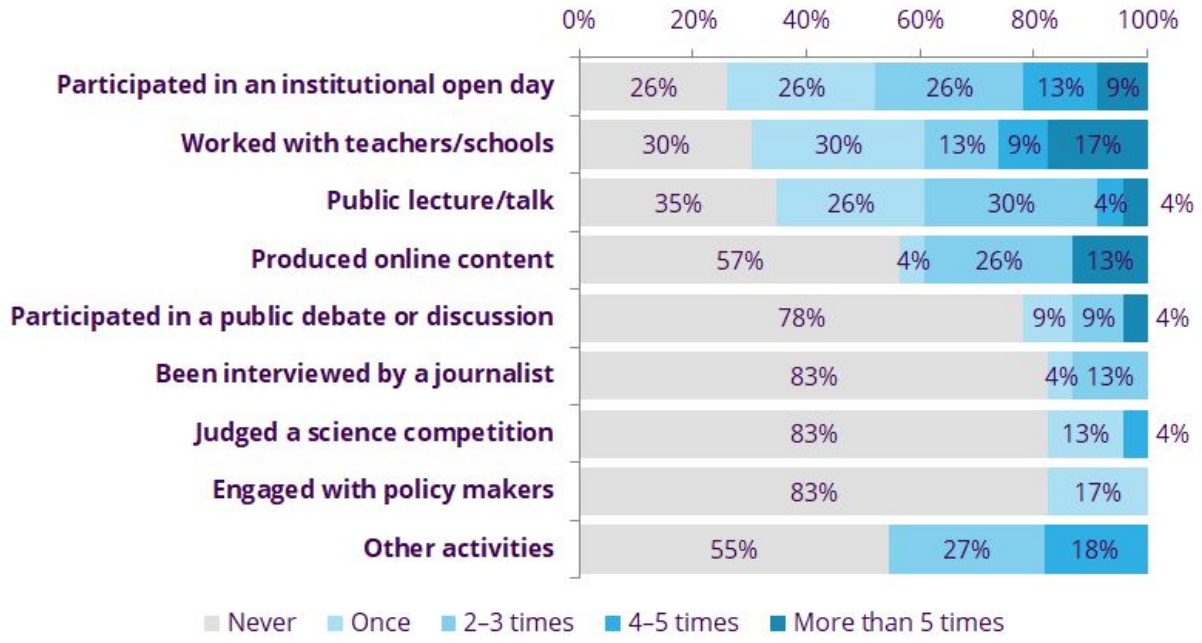
Participants represented and gave students insight into a wide range of areas within medical research.

The map (right) shows the locations of UK-based institutes and universities of participating researchers, additionally, researchers from the MRC Unit The Gambia at LSHTM took part.

Previous public engagement experience

As part of a feedback survey carried out in December 2020[7] researchers who had taken part in the 2018, 2019, or March 2020 events were asked what **public engagement activities they had been involved with in the 12 months prior to their participation**:

23 of 64 survey respondents answered this question. Respondents who participated in the Summer or November 2020 events were not asked this question as the 2020 COVID-19 pandemic limited opportunities for public engagement.



Other activities that respondents had participated in included science festivals/fairs, STEM ambassador events, and projects such as *Pint of Science* or *FameLab*.

Only 3 of the 23 respondents to this question reported taking part in no activities at all in the year prior to their participation; the majority of respondents had taken part in at least one public engagement activity.

[7] See also: *Impact; Researcher feedback*

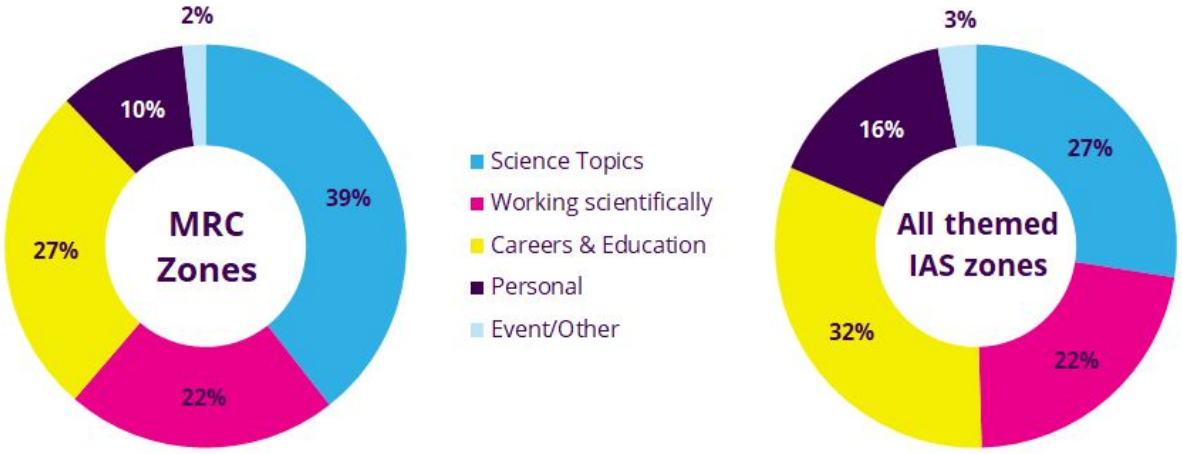
Discussion topics

Common themes

Question themes in 'Ask'

Questions submitted by students (outside of chats) are coded according to their theme. The charts below show the proportion of questions of each category amalgamated for the MRC zones, as well as the total for IAS themed zones.[8]

When compared with the other themed IAS zones, questions in MRC zones were more commonly focussed on science topics than other areas: 39% vs 27%.

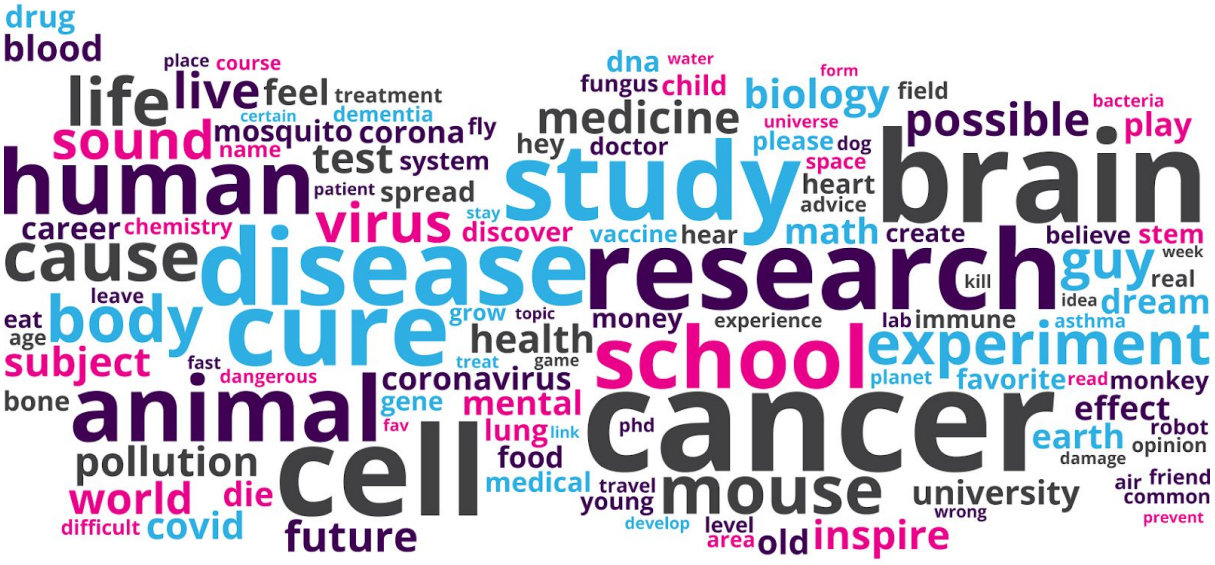


[8] IAS total is the amalgamation for UK IAS themed zones run since June 2017. Themes of questions asked in individual MRC zones can be found in the zone reports:
See also: *Participants and activity; Summary of activity; Zone reports*

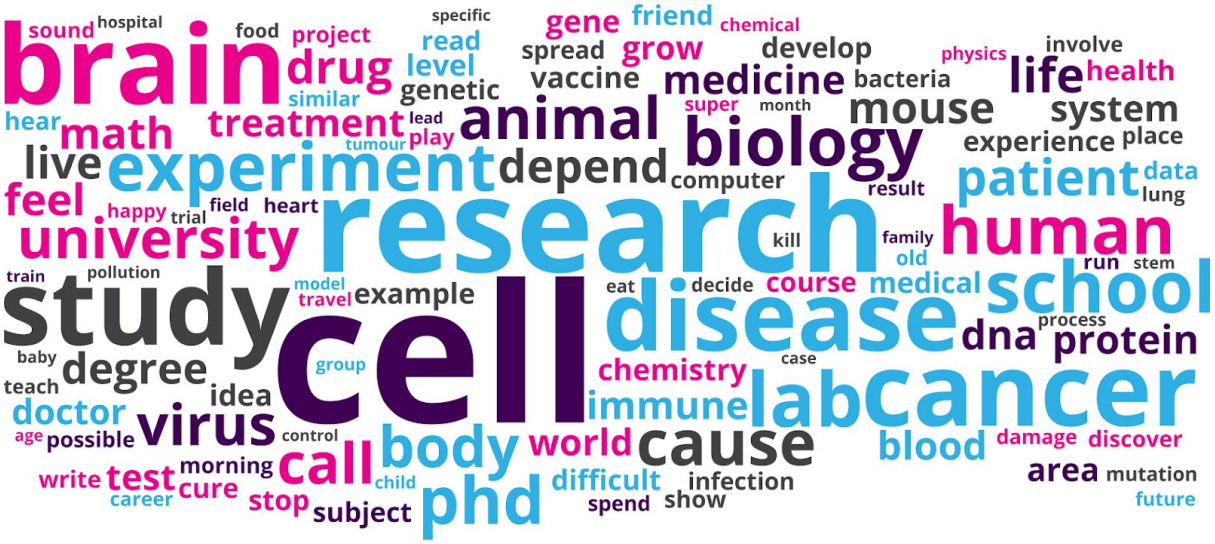
Topics in live chats

The images below show common words used in live chats. Size of the word is proportional to frequency of use. (Colour has no relevance.)

Common words used by students



Common words used by researchers



Discussion of medical research themes

We carried out an analysis to estimate the proportion of interactions between students and researchers which included a medical research theme.

Interactions included:

- **Questions asked** — These are posted on the site by students. They include questions which were approved and sent to researchers, as well as those that were marked as duplicates (similar questions to those that had already been approved).
- **Answers** — Researchers' responses to posted questions
- **Live chat lines** — This includes anything posted in a live chat, including questions and answers from researchers, students, and teachers. (Moderator lines are not included.)

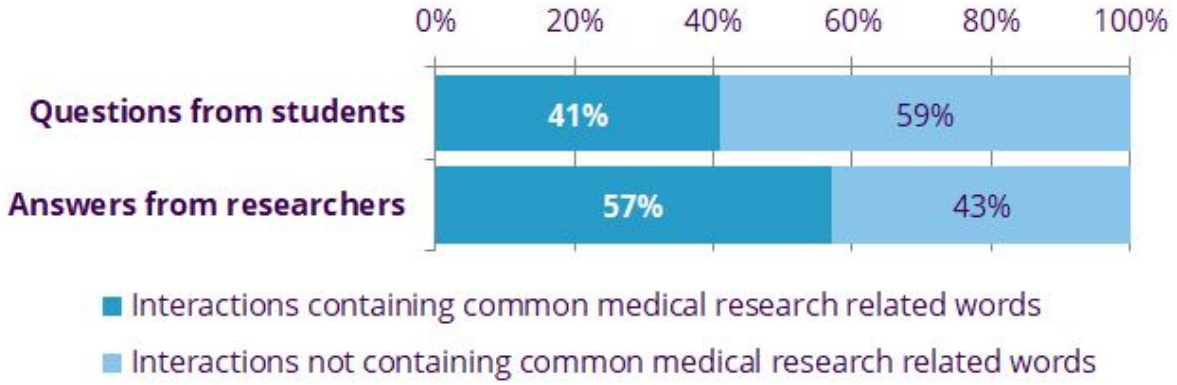
Content from these interactions was cleaned to remove common words (*and*, *that*, *if*, etc), with the remaining words being standardised to their root word.

We looked at 1,004 words which were used more than 100 times and coded them as relating to medical research or not. 172 common related words were identified.

The most frequently used medical research related words included: *cell, brain, disease, cancer, human, body,* and *virus*.

These words were then compared back to the interactions, with a sample checked to ensure the terms were part of relevant conversations. Interactions were marked as relating to medical research if they included one of these words. This allowed us to estimate the proportion of interactions between students and researchers which related to medical research themes.

Questions and answers in 'Ask'

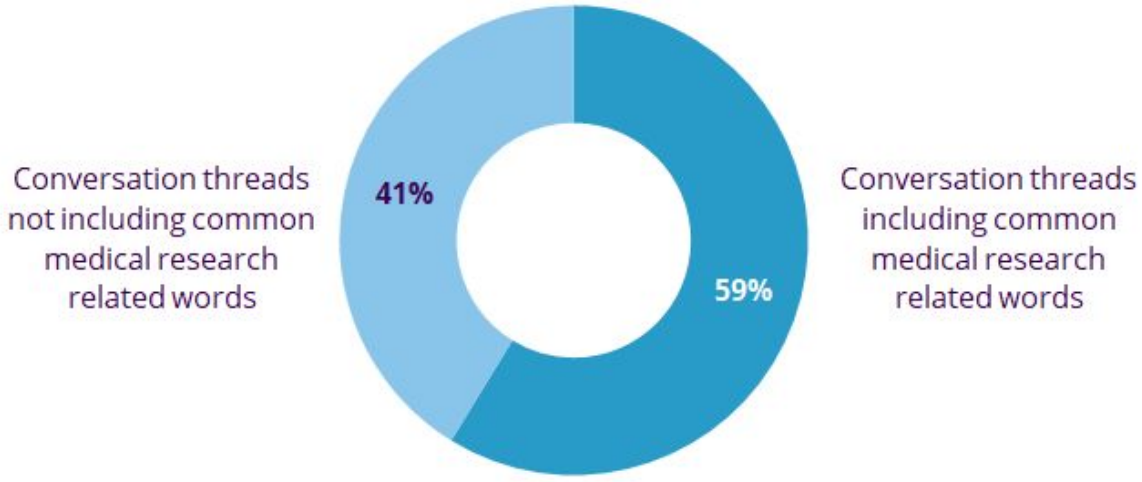


Conversations in live chats

Live chats offer a reply function, where users can reply directly to one another, creating 'threads' of conversation.

74% of live chat lines were part of a threaded conversation between students/teachers and researchers.[9]

59% of these conversations included words relating to medical research.



Moreover, **every school live chat** included conversations which featured common medical research related words.

Researchers were more likely to use medical research words than students. This is as expected as researchers are sharing their own expertise with the students. Researchers responded to questions such as 'what do you work on?', or 'how does your work impact society?', with details about their own research, giving students an opportunity to learn about medical research while their original questions may not have directly asked about the topic.

Additionally, 47% of total comments posted on the site contained common medical research related words.

[9] The remaining 26% of lines were either not part of a conversation thread (e.g. 'Hi's or 'Bye's when joining or leaving the chat), conversations where people didn't use the reply function, or conversations between just students and teachers, or between just researchers.

Examples of medical research related interactions

Questions in 'Ask'

What changes in brain activity when listening to music? And how does the brain receive the information?
— Student question

Why is it taking so long to get a cure for the corona virus?
— Student question

What is the worse case of diabetes in a child that you have researched so far? And what symptoms do people with diabetes have?
— Student question

What interests you most about DNA and genes?
— Student question

What made you chose to study about lung cancer? and did anyone influence you?
— Student question

What are the worse kind of effects that pollution has on our lungs?
— Student question

Extended discussions in comments around medical research

How does stress affect the brain and the rest of the body?

Student question with extended discussion in comments: medical20.imascientist.org.uk/question/how-does-stress-affect-the-brain-and-the-rest-of-the-body/

Thanks for the replies. but how does stress weaken the immune system? Is it because the brain is too busy trying to deal with the threat that it needs more nutrients so it steals it from other organs?
— Student follow up comment

I was reviewing the live chat that we had today and then I thought of this question from the discussion we were having about neurons making new connections. If they don't naturally form synapses with the original neuron, is there no way to encourage the neurons to make similar pairings?

Student question with extended discussion in comments: medical20.imascientist.org.uk/question/hi-nina-its-me-again-i-was-reviewing-the-live-chat-that-we-had-today-and-then-i-thought-of-this-question-from-the/

Impact

I found [IAS] was better at improving science capital of the students [compared with other public engagement projects]. For instance showing students how medical research is relevant to their own background, and realistically demonstrating that you don't have to be 'clever' or male to succeed in science.

Other outreach events I have participated in have mostly tried to simply make science fun for the public. Whereas this experience really did highlight some barriers and prejudices the students had for a successful career in science.

— MRC Researcher, Feedback survey

Supporting Science Capital

I'm a Scientist, Supporting Science Capital

In 2019 Jen DeWitt, PhD, an independent research and evaluation consultant, and member of the core team developing and applying the concept of science capital, conducted an evaluation of IAS to see how the experience might support students' science capital.

The research comprised student focus groups, teacher interviews, surveys and analysis of content generated on the IAS site including transcripts of live chats and questions asked by students.

The evidence produced by this research demonstrates that the experience of IAS maps onto elements of the Science Capital Teaching Approach. In turn, this supports science capital-related outcomes of participating in IAS.

The research discussed in the following section applies to the IAS project as a whole.

Read the full report (PDF):
about.imascientist.org.uk/files/2019/11/IAS-Science-Capital-Main-Report-Sep-2019.pdf

Background: Science capital

Science capital[10] is a set of resources that helps individuals engage and identify with science. Young people with higher levels of science capital are more likely to see science as 'for me' and to choose to study science subjects at a higher level.

The Science Capital Teaching Approach (Godec, King, & Archer, 2017)[11] aims to enhance young people's engagement with science, supporting them in seeing science as relevant to their lives and 'for me'.

The foundation of this approach involves broadening what counts in the science classroom: creating a learning environment where all students feel able to offer contributions from their own experiences and interests. The approach also consists of three main pillars:

1. **Personalising and localising:** Going beyond contextualising, to connect to the actual experiences, understandings, attitudes and interests of young people.
2. **Eliciting-valuing-linking:** Inviting students to share knowledge, attitudes and experiences; recognising these as having value; and connecting this back to the science.
3. **Building the dimensions of science capital:** Considering the eight dimensions when developing activities, lessons or programmes.

Supporting science capital

The research found evidence that IAS provides support for four of the science capital 'dimensions':

- **Science literacy** (Dimension 1)
- **Seeing science as relevant to everyday life** (Dimension 2)
- **Knowledge about the transferability of science/science qualifications** (Dimension 3)
- **Knowing people in science-related jobs** (Dimension 7)

[10] ucl.ac.uk/ioe/departments-and-centres/departments/education-practice-and-society/science-capital-research
[11] discovery.ucl.ac.uk/id/eprint/10080166/

Science literacy (Dimension 1)

By providing the opportunity to ask about science content, taking part in IAS contributes to science literacy.

Seeing science as relevant to everyday life (Dimension 2)

Because students can ask questions of interest to them personally, taking part in IAS can enhance science-related attitudes and values, helping students to see science as relevant to their everyday lives.

Knowledge about the transferability of science (skills, knowledge, qualifications) (Dimension 3)

When students ask about qualifications, participation may improve their knowledge of the range of jobs that science can lead to.

Knowing people in science-related jobs (Dimension 7)

Most importantly, however, IAS provides an opportunity to get to know scientists — about the paths they took to their current work, about a range of aspects of their work (e.g. travel, teamwork) and about their lives outside of work. Students may even discover that scientists are not all 'super geniuses' — that they are normal individuals, albeit with interesting jobs.

In sum, IAS is personally relevant to students and their lives, elicits and values students' questions and experiences, and provides support for building dimensions of science capital. Together, its various elements create an environment in which students are able to contribute from their own interests and experiences.

Consequently, through participating in IAS, students can come to see science as personally relevant to them and to appreciate that scientists are 'normal people'. Moreover, ultimately it is the participating students who are in control — it is their votes that determine the winner.

This environment, we believe, reinforces that the arena of *I'm a Scientist* is one in which it is students' valued and valuable opinions that count the most. Together, then, the elements of IAS can support students' science capital, meaning IAS has an important role in helping young people see that science just might be 'for me' which, in turn, can contribute to nurturing science aspirations.

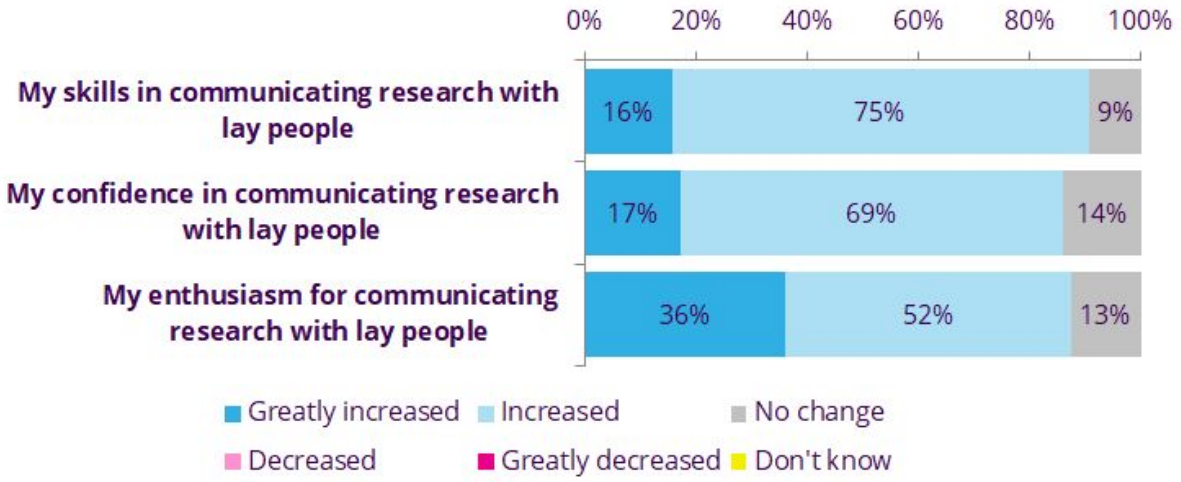
Researcher feedback

In December 2020 MRC researchers who had taken part 2018–20 MRC zones were asked to complete a survey looking at the possible impacts of their taking part, and for feedback on their experience.

64 researchers responded to the survey.

Communication skills, understanding, and enthusiasm for public engagement

Researchers were asked what, if any, impact taking part in IAS had on their skills, confidence, and enthusiasm for communicating research with lay people.



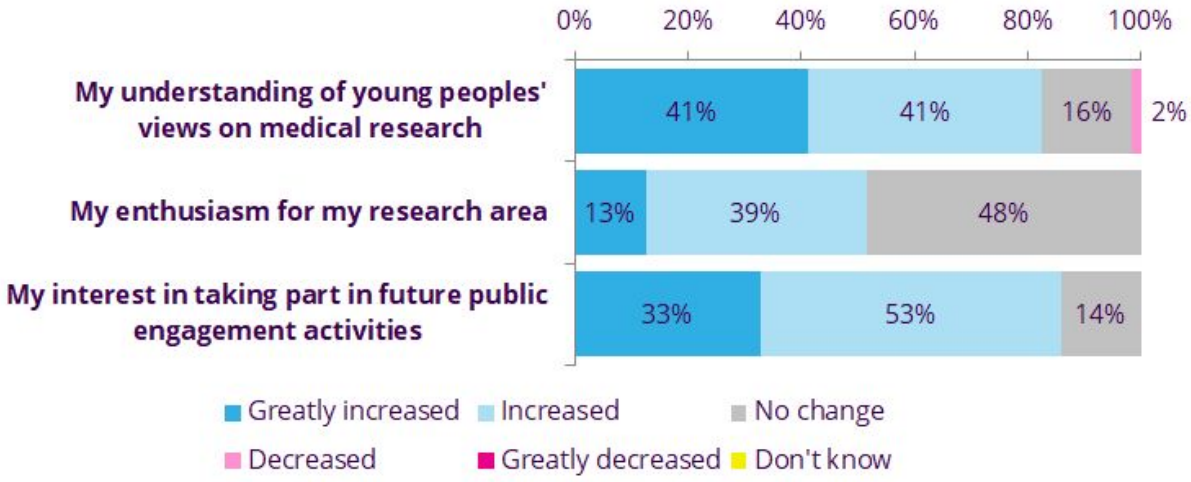
The majority of respondents reported increases in their skills, confidence, and enthusiasm towards public engagement, with no people reporting negative impacts.

The chats challenge you to think on your feet in a rapid fire manner whereas the questions on the forums give me an opportunity to be introspective about how I respond.

I've had kids ask me fun, ridiculous, and out of the box questions around research and science which lets me see my research in a new light. But I've also had children ask me very personal questions related to my experience and my area of study which has reinforced why my doing what I'm doing is important and why my visibility in doing it is equally crucial.

— Researcher, Feedback survey

Additionally, participants were asked about the impact on their understanding of young peoples' view on medical research, their enthusiasm for their own research area.



[IAS] gave me a better insight into how young students think about science and really the world in general. I have never had such interesting and insightful exchange in other activities I have undertaken before, maybe the screen makes the audience braver in asking questions and general engagement.

— Researcher, Feedback survey

Public engagement activity

Researchers who had taken part in events in 2018, 2019, and March 2020 were asked what, if any, public engagement activities they had taken part in, in the 12 months prior to their participation. Those who had taken part in 2018 or 2019 were also asked what activities they had engaged with in the 12 months after taking part.[12]

As discussed in previous sections, the most common activities researchers had taken part in in the 12 months prior to their participation were institutional open days, working with teachers or schools, and giving public lectures or talks.[13]

Additionally, while 65% (15/23) had given a public lecture or talk, only 22% (5/23) reported that they had taken part in a public debate or discussion.

[12] The 2020 COVID-19 pandemic limited opportunities for public engagement activities; it was not appropriate to survey participants on their activities in this period.
[13] See also: *Participants and activity; Participating researchers; Previous public engagement experience*

As discussed above, 86% (55/64) reported that participating in IAS increased their interest in taking part in future public engagement activities.[14]

Professional advantages

Participants were asked in what ways they felt they had benefited from taking part in IAS.

- **41% (26/64) reported benefits to their profile as a researcher** (e.g. how well known they are both in and outside of their institution for public engagement and awareness of the area of science they work in)
- **40% (25/64) reported benefits to their networks and relationships** (e.g. contacts in outreach and academic communities)
- **14% (9/64) reported benefits to their professional reputation** (e.g. scientific gravitas and achievement)

When asked if there were 'other' ways in which they had benefited from taking part in IAS, respondents reported increased communication skills, and "understanding of community engagement." One respondent had benefited from a "sense of community and civic involvement."

Comparison to other forms of public engagement

Researchers were asked how their experience taking part in IAS differed from other forms of public engagement they may have taken part in.

Three key areas stood out in researchers' responses:

1. Researchers highlighted that **participating in IAS was easy**, in that they were able to take part in their own time, selecting the live chats which fit around their schedules, and that they were able to engage with the activity without having to travel or leave their home, office, or lab.
2. Researchers felt that the pseudo-anonymity of online engagement allowed a **broader range of students to ask questions and join the discussion** than might otherwise during 'face-to-face' engagement.
3. Respondents commented on the **greater depth of engagement** possible in IAS, promoted by the student-led discussions.

[14] See also: *Impact; Researcher feedback; Communication skills, understanding, and enthusiasm for public engagement*

Ease of engagement

I really enjoyed it and it being online meant it was much more flexible and I could work it around my lab work very easily rather than having to physically be somewhere for it which was great!

It was a fantastic, fun experience. I liked the flexibility of doing it in your own time and remotely (well prepared pre-covid!) It was enlightening having conversations with young people about their perceptions of science or what interests them. It was a fantastic experience, a well-oiled machine.

The time [the students] spent with the researchers was longer and because they could ask questions later, they could also come back with further questions, which was lovely. It was very convenient for me as well, as I didn't have to take a day off work to go to a fair. I just sat in front of my computer and answered questions!

Really enjoyable as I could fit it in with my schedule and speak to a really broad range of people.

Engaging more students

It was the most interaction I have had with school students, where every student in the class really had the opportunity to ask whatever questions they wanted. In-person events with a large number of students at once are harder to reach all the students (often a few students chat a lot and you don't get to speak to the quieter ones as much). I think this format encouraged more questions to be asked from more of the students.

This was my first experience of public engagement as a new PhD student but I like the format and that it's accessible to kids in the class that wouldn't necessarily speak up or be engaged in science.

I like that it's about showing scientists as real people with a human side and trying to break down the gatekeeping of science for only those who are deemed 'clever enough' or a 'typical scientist'.

Connection with the students feels stronger; easier for students to ask what's on their mind when more faceless.

I think it was great because the pupils could ask whatever questions they wanted. During science fairs, I think they feel constrained to ask about what you've just told/showed them, but with I'm a Scientist they asked whatever they wanted.

I enjoyed it. I usually tend to find some of the in-person public engagements a bit awkward since it is difficult to get the students to engage and show interest and do fun activities with us. But online, it seems like both the students and the scientists were more relaxed and curious to ask questions and answer.

I actually loved that it was text messaging only which may have encouraged students who would be too shy to speak out to engage. It also gave time to formulate careful questions which was evident from the quality of the questions that were coming in.

Depth of engagement

[IAS] has been my only way of directly connecting with school children and I love that it's a one-on-one approach that lets you truly grasp children's level of understanding, which, by the way, is greatly underestimated. The chats challenge you to think on your feet in a rapid fire manner whereas the questions on the forums give me an opportunity to be introspective about how I respond.

I've had kids ask me fun, ridiculous, and out of the box questions around research and science which lets me see my research in a new light. But I've also had children ask me very personal questions related to my experience and my area of study which has reinforced why my doing what I'm doing is important and why my visibility in doing it is equally crucial.

I was able to explain a lot more about science compared to when I would be at a festival and explaining a scientific activity to the public.

I had never engaged with school-goers before, so it was really interesting to engage with such young participants and understand how they approached questions about science, and also the limits of their attention spans!

One researcher commented on the ability of IAS to enable real interactions with researchers, rather than simply 'making science fun' could help support students' science capital:

I found it was better at improving science capital of the students. For instance showing students how medical research is relevant to their own background, and realistically demonstrating that you don't have to be 'clever' or male to succeed in science.

Other outreach events I have participated in have mostly tried to simply make science fun for the public. Whereas this experience really did highlight some barriers and prejudices the students had for a successful career in science.

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