



# Public Engagement with STEM: Staff and Volunteers Survey

Data summary

April 2019

National Forum for Public Engagement with STEM

[www.publicengagement.ac.uk/national-forum](http://www.publicengagement.ac.uk/national-forum)

# Introduction

The National Forum for Public Engagement with STEM conducted a consultative survey between October and December 2018 in order to:

- gather useful intelligence about organisations working in informal STEM engagement
- understand better the relevance of the work of the National Forum and how it could be improved
- gather data on diversity and inclusion

The survey was promoted via Forum members networks via social media and newsletters. There were a total of 158 responses. The survey included a variety of closed and open questions exploring the following topics:

- Demographic and professional information
- Their understanding of their audiences, and their aims
- The challenges they identify in their roles
- Their professional development
- Their approaches to and uses of evaluation and audience data
- Their approaches to and uses of Science Capital
- Their reflections on diversity in the sector
- Their reflections on how the PE STEM sector is funded
- Their reflections on the Forum

This report summarises the results. The open questions have been coded to identify key themes emerging from the responses.

We would like to acknowledge that we can not make any claim about how representative this survey is of those working in public engagement with STEM. There are still many unknowns about [how many people are working in informal STEM engagement, the types of organisations and the roles that they play](#). All respondents were self-selecting, and we do not know the overall sample size (i.e. how many people the survey was sent too).

We have found this exercise useful and the results are both interesting and provide ground for further reflection. If you have any comments about this report or would like to know more about the work of the National Forum, please contact the secretariat: [nccpe.enquiries@uwe.ac.uk](mailto:nccpe.enquiries@uwe.ac.uk)

# Acknowledgements

The survey was developed and analysed with significant support from Clio Heslop (Cultural Partnerships Manager), British Science Association.

## About the National Forum

The National Forum is a collective of key funders and organisations involved in setting the national agenda for public engagement in STEM. Established in 2014, our goal is to improve collaboration, co-operation and learning across the sector. We want to make better collective decisions and accelerate improvements across the science engagement 'system'.

The Forum seeks to effect change in three main ways:

- By challenging ourselves to improve our work, using evidence, expert input and intelligence gathering to stimulate innovation and set strategic direction.
- Working with the wider STEM Engagement community to identify areas where we can affect system-wide change through collective action. This is driven largely through our working groups and events.
- Developing tools, resources and initiatives which support change.

We want to tackle 'sticky problems': known sector-wide issues that can't be solved by people working in isolation, and that require concerted and collaborative effort over the long term. For instance, how to address the balance of our funding across different purposes and audiences for engagement; identifying priority areas for sustained public engagement; exploring how we can gather more useful intelligence on the long term impact of our work; and better supporting professional development and recognition.

Find out more here: <http://publicengagement.ac.uk/national-forum>

**Photo credits:** UK Association for Science and Discovery Centres (front page)  
Danceroom Spectroscopy, credit: Paul Blakemore (back cover)

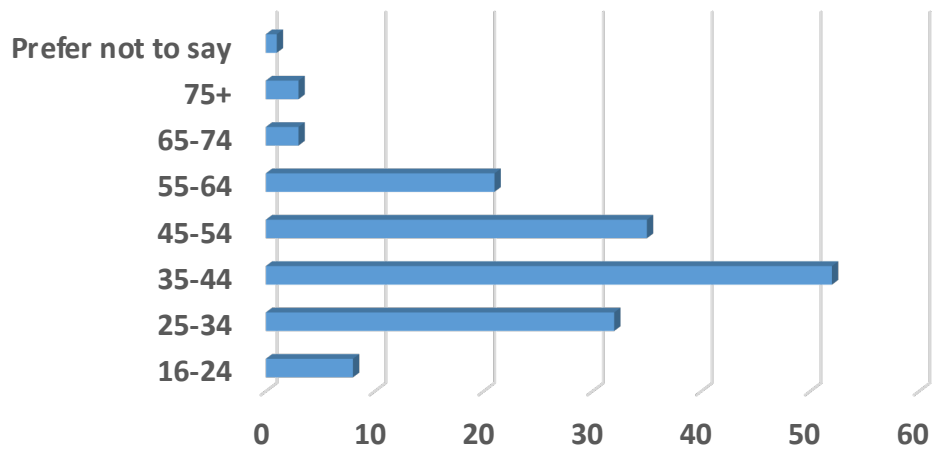
## Table of contents

Topic	Slide
<u>Who responded (demographic information)</u>	4
<u>Where they work</u>	10
<u>Their qualifications</u>	13
<u>The roles they play</u>	15
<u>The audiences they work with</u>	19
<u>The aims of their public engagement activity</u>	22
<u>The challenges they identify in their roles</u>	24
<u>Their professional development</u>	27
<u>Using audience data</u>	29
<u>Approaches to evaluation</u>	32
<u>Their approaches to and uses of Science Capital</u>	40
<u>Their reflections on diversity in the sector</u>	45
<u>Their reflections on how the PE STEM sector is funded</u>	53
<u>Their reflections on the Forum</u>	60
<u>Networking event findings</u>	63

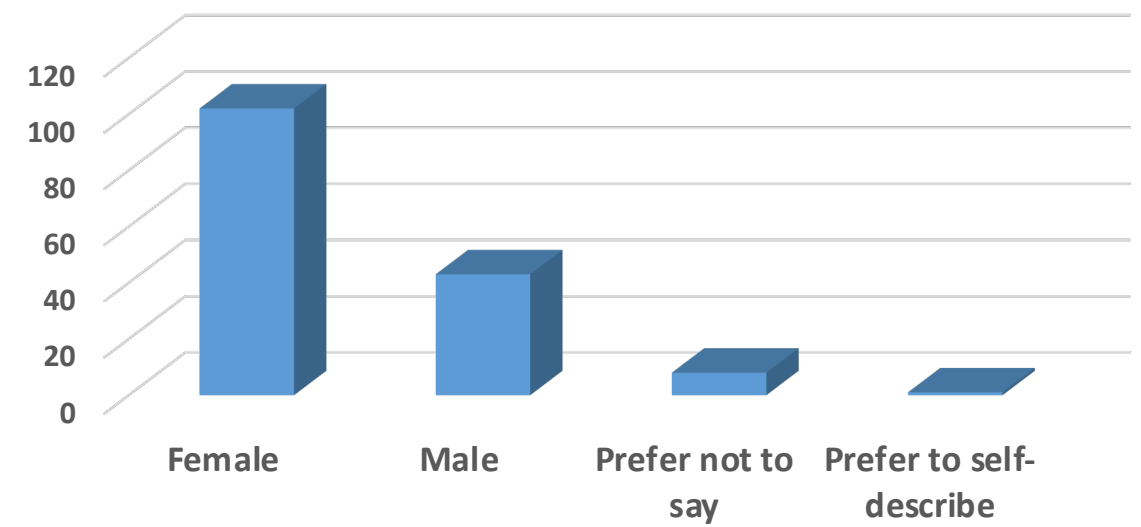
# Who responded?

The survey was open between October 2018 and January 2019. There were 158 responses. We draw some comparisons with national data to contextualise the demographic information that was gathered.

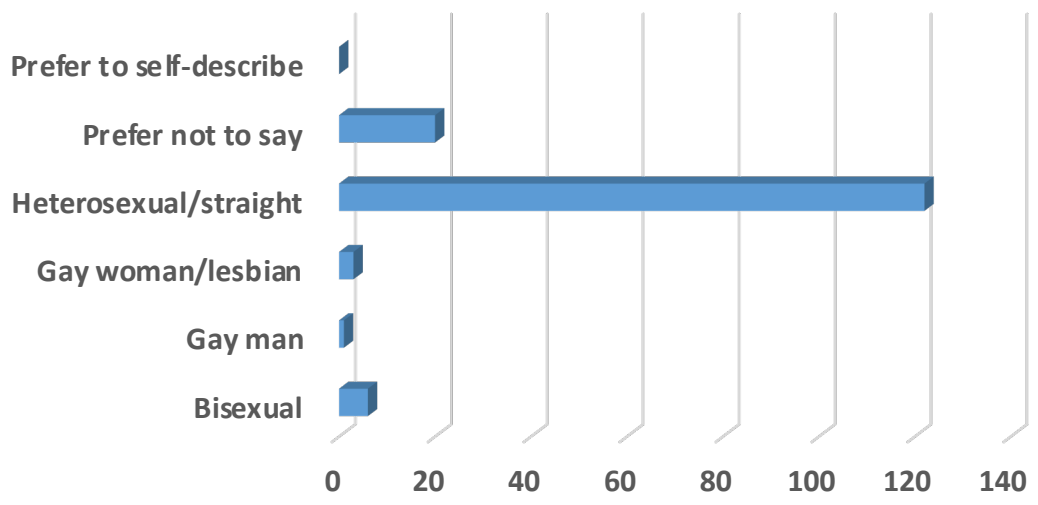
### Which of these age bands do you belong to?



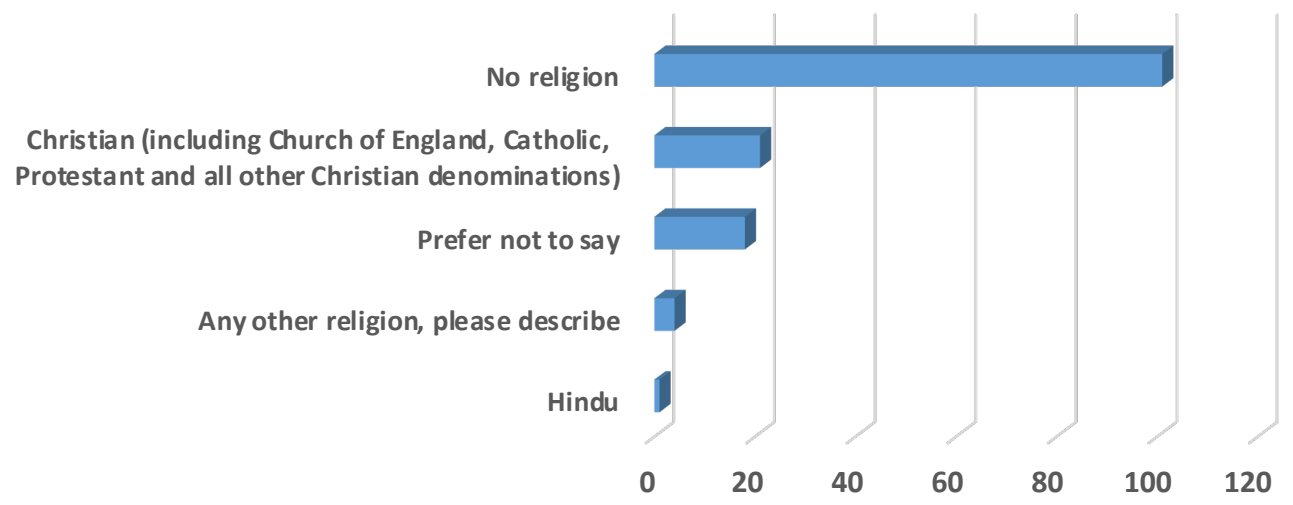
### What best describes your gender?



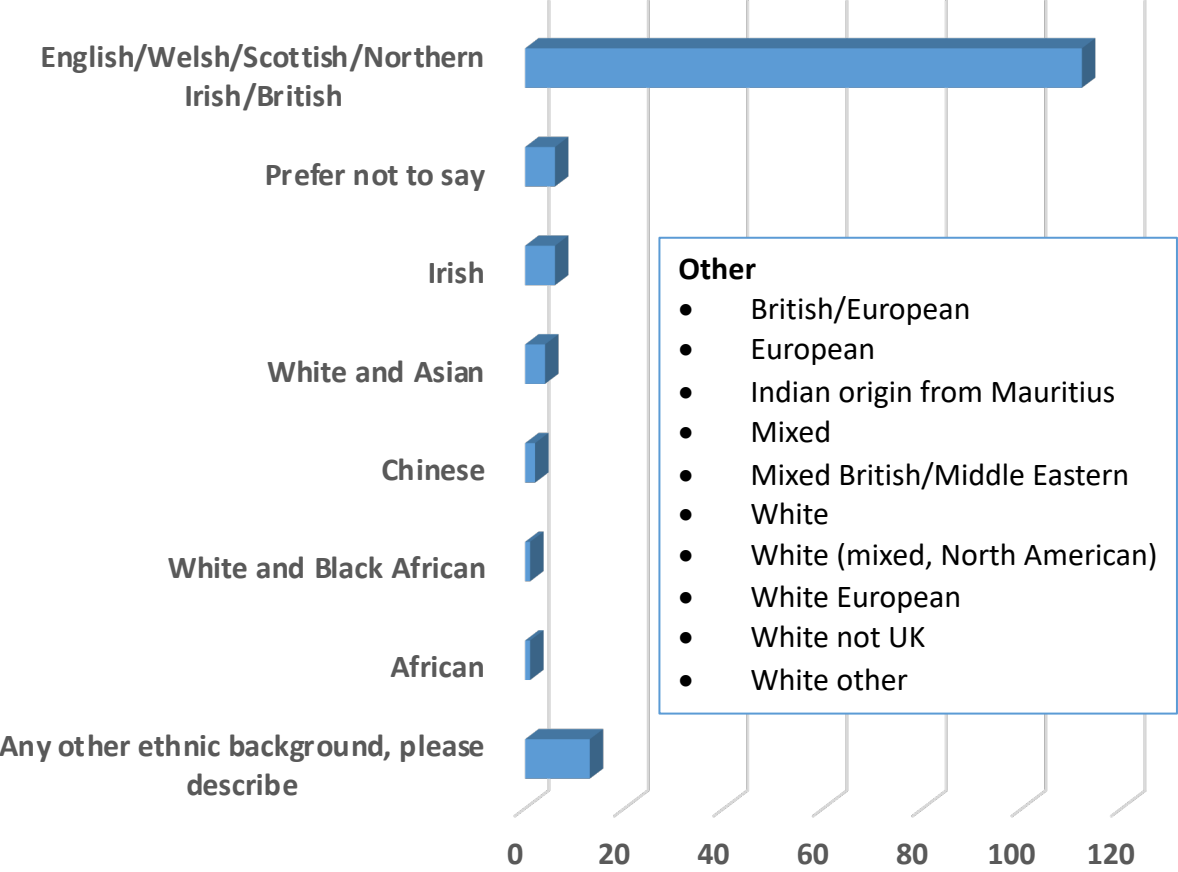
### What is your sexual orientation?



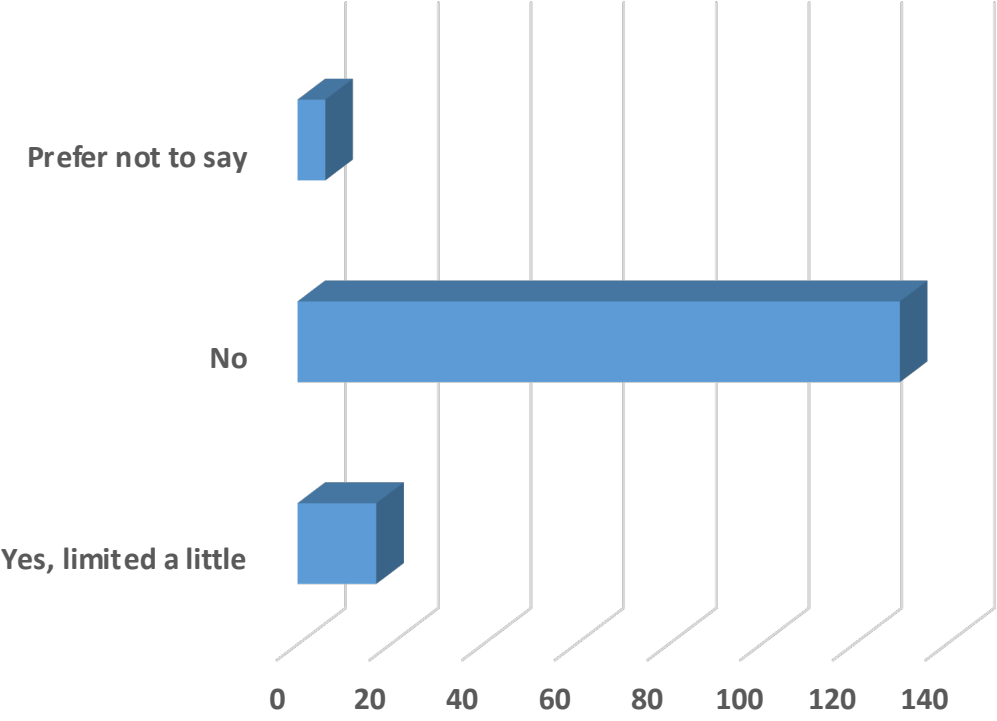
### What is your religion?



**What is your ethnic group? Choose one option that best describes your ethnic group or background?**

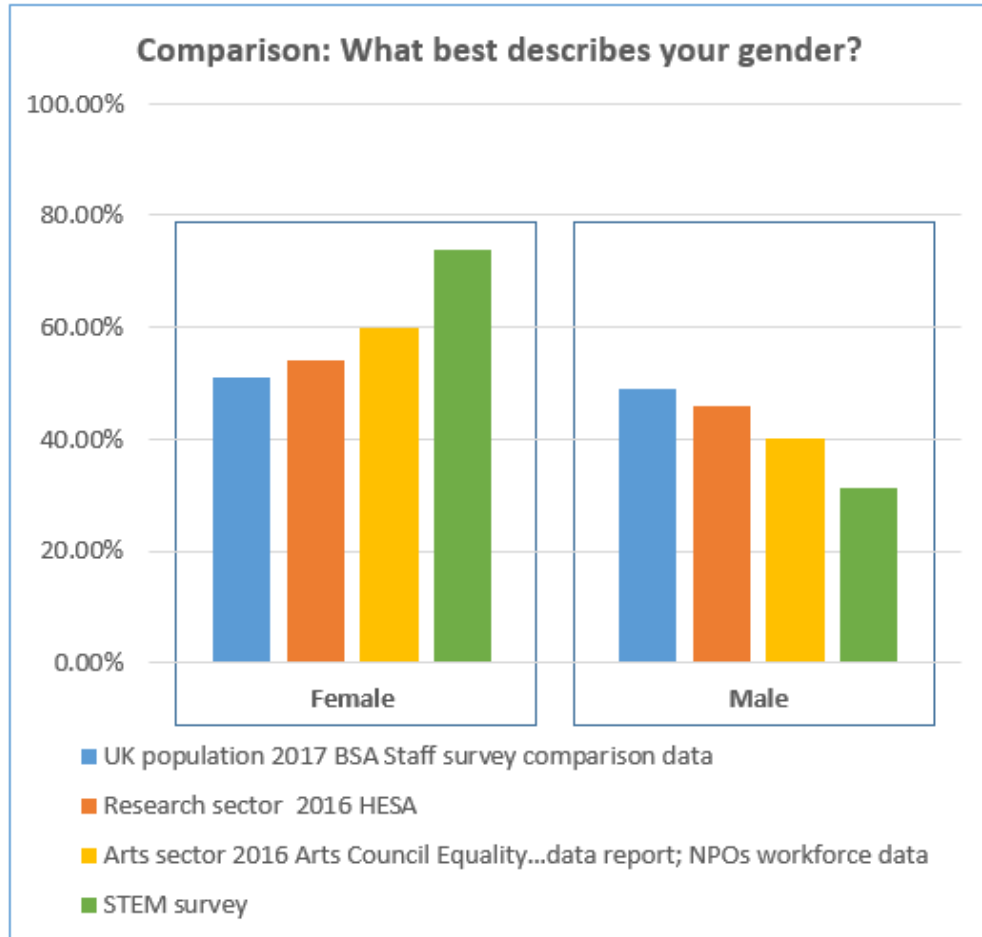


**Are your day-to-day activities limited because of a health problem or disability which has lasted, or is expected to last, at least 12 months?**

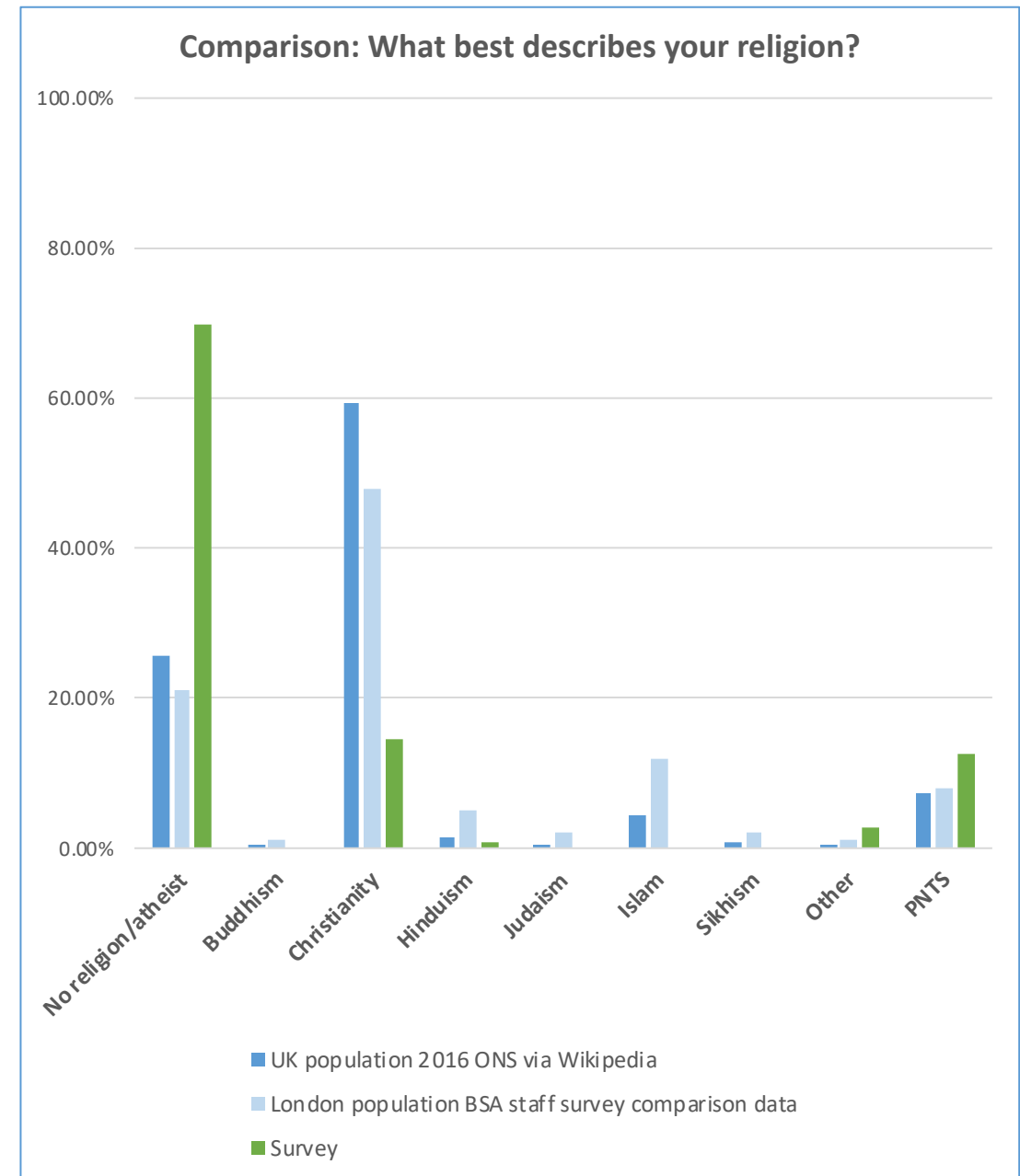


## Comparison with national data

The next three slides compare the demographic information from the survey sample with national data. Where data exists, we have drawn comparisons with the Arts sector, Research sector & London populations

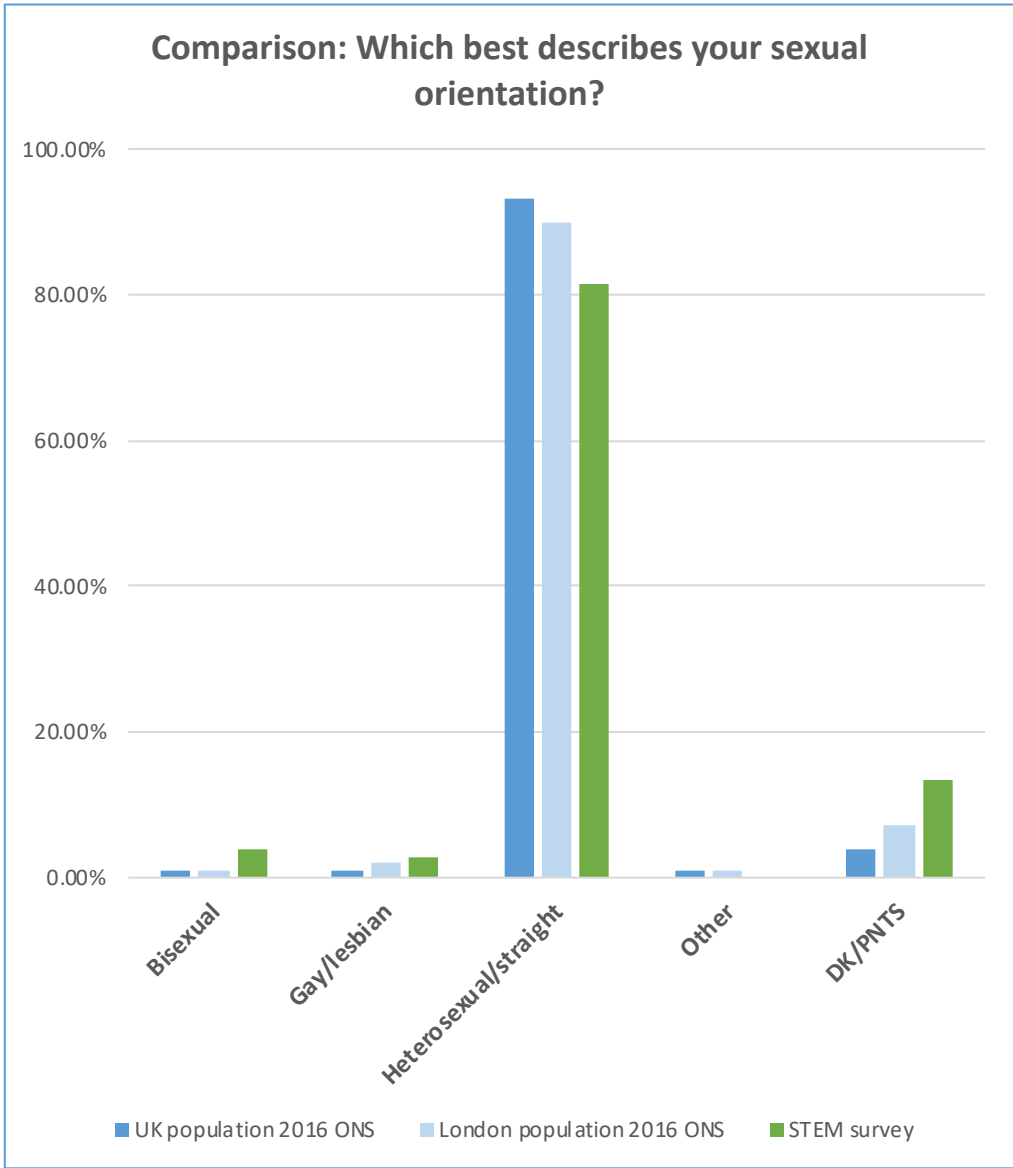


The male / female split in the people completing the STEM survey and defining their gender is significantly different to other sectors / national data

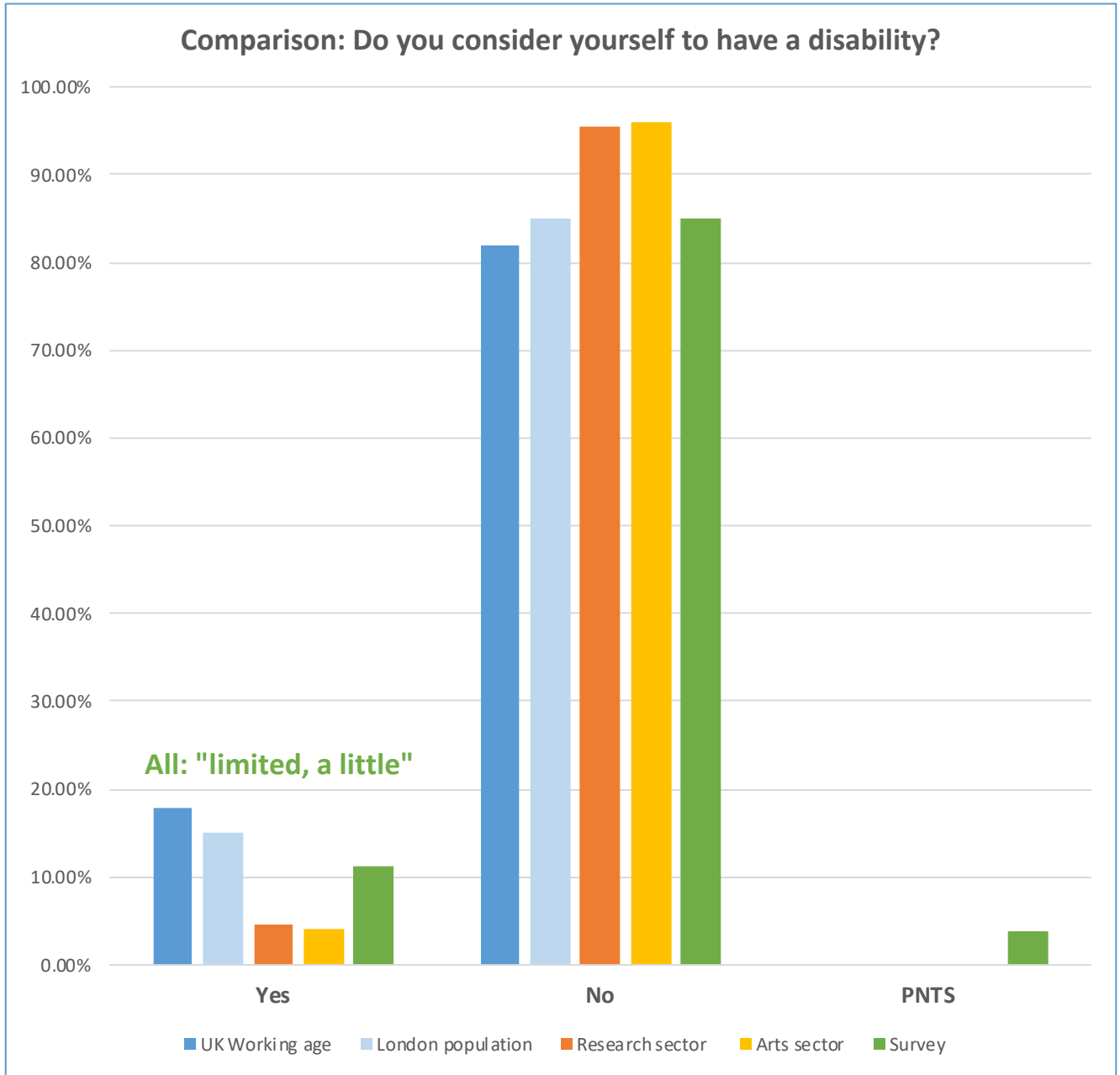


Note: no data available for Arts or Research sector





Note: no data available for Arts or Research sector



# Comparison: What best describes your ethnic background? (n/a where no data exists)

Please note: there are some issues with how we asked about ethnicity in the survey which limit the robustness of comparisons with national data

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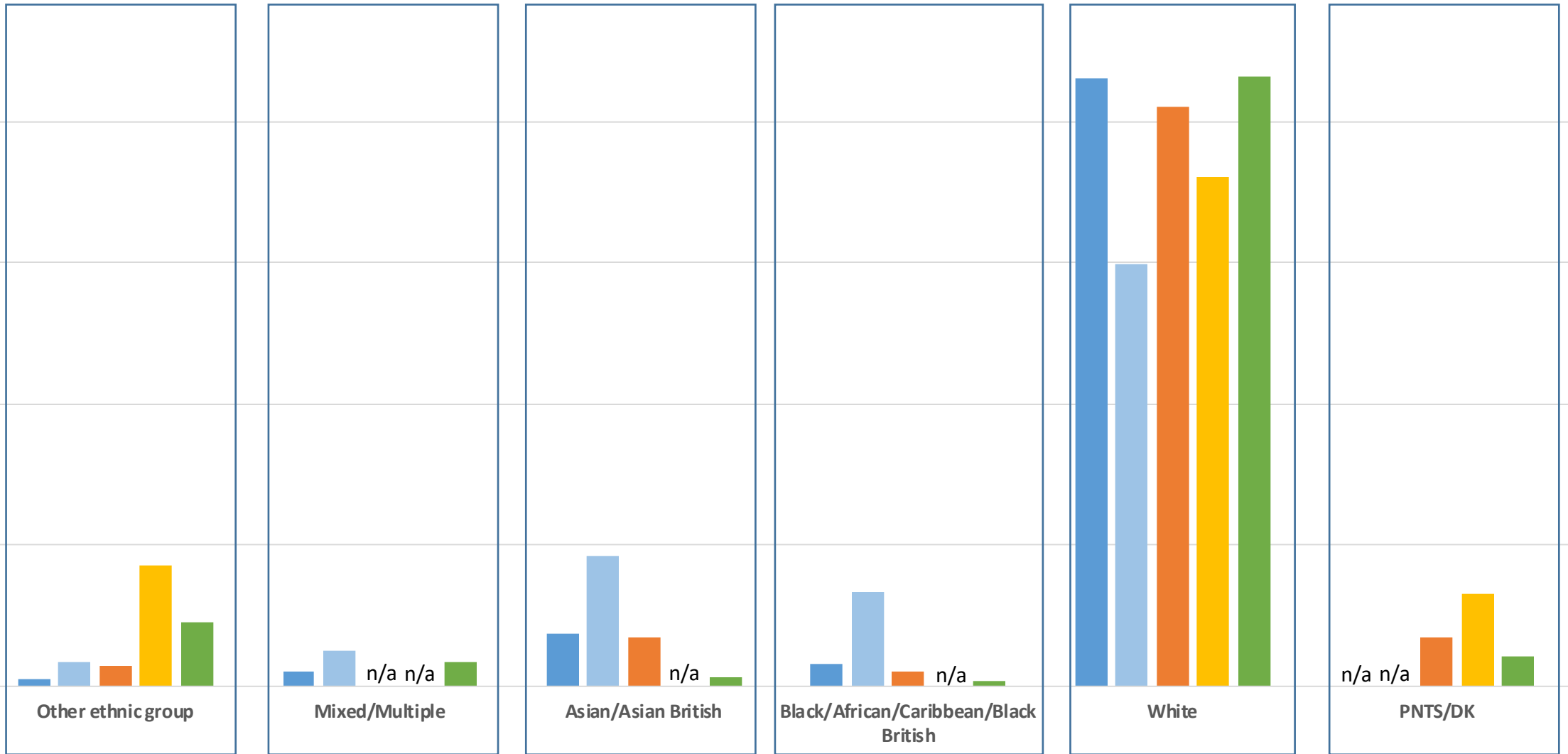
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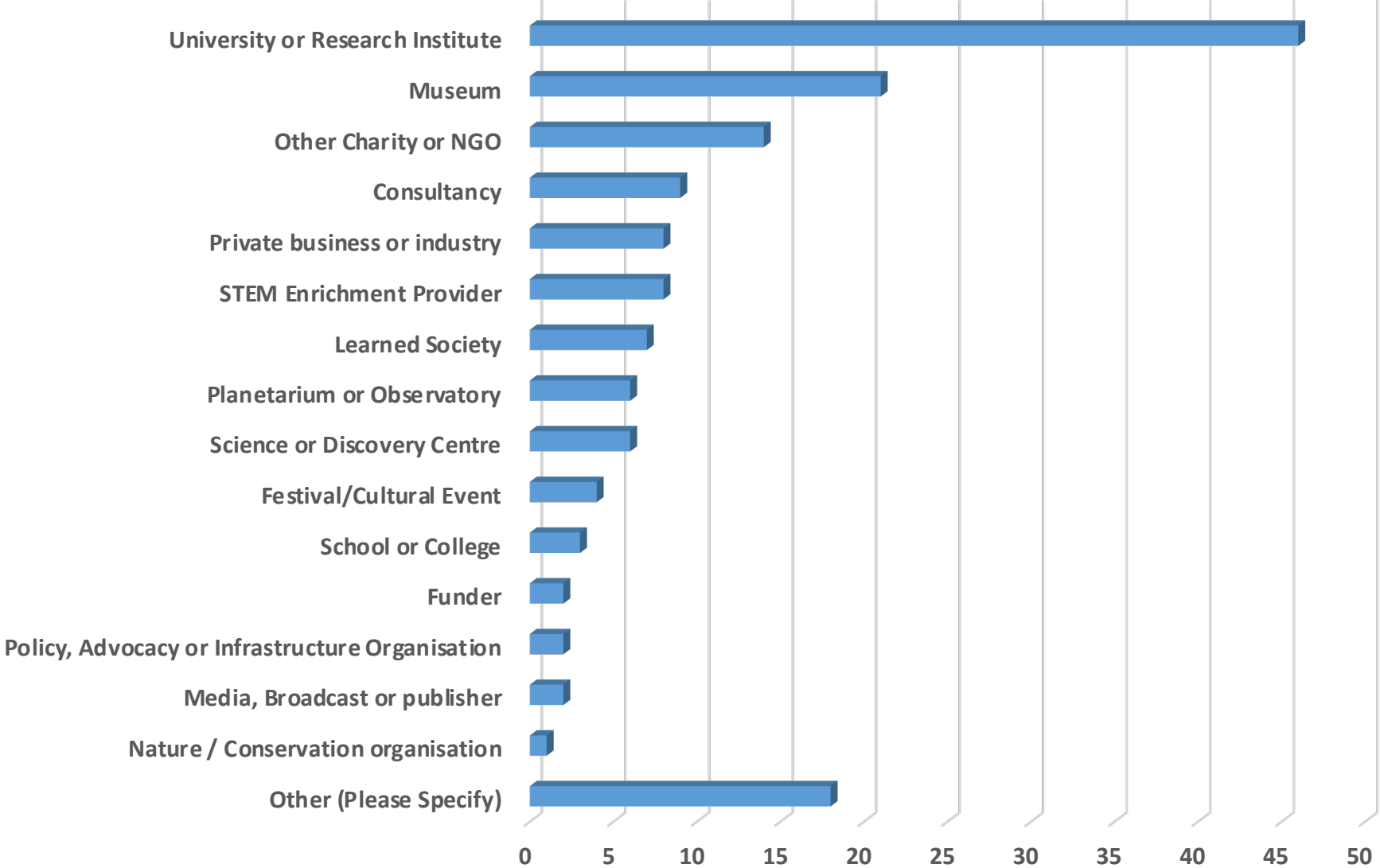


■ Eng & Wales population   ■ London population   ■ Research sector   ■ Arts sector   ■ Survey

# Where they work

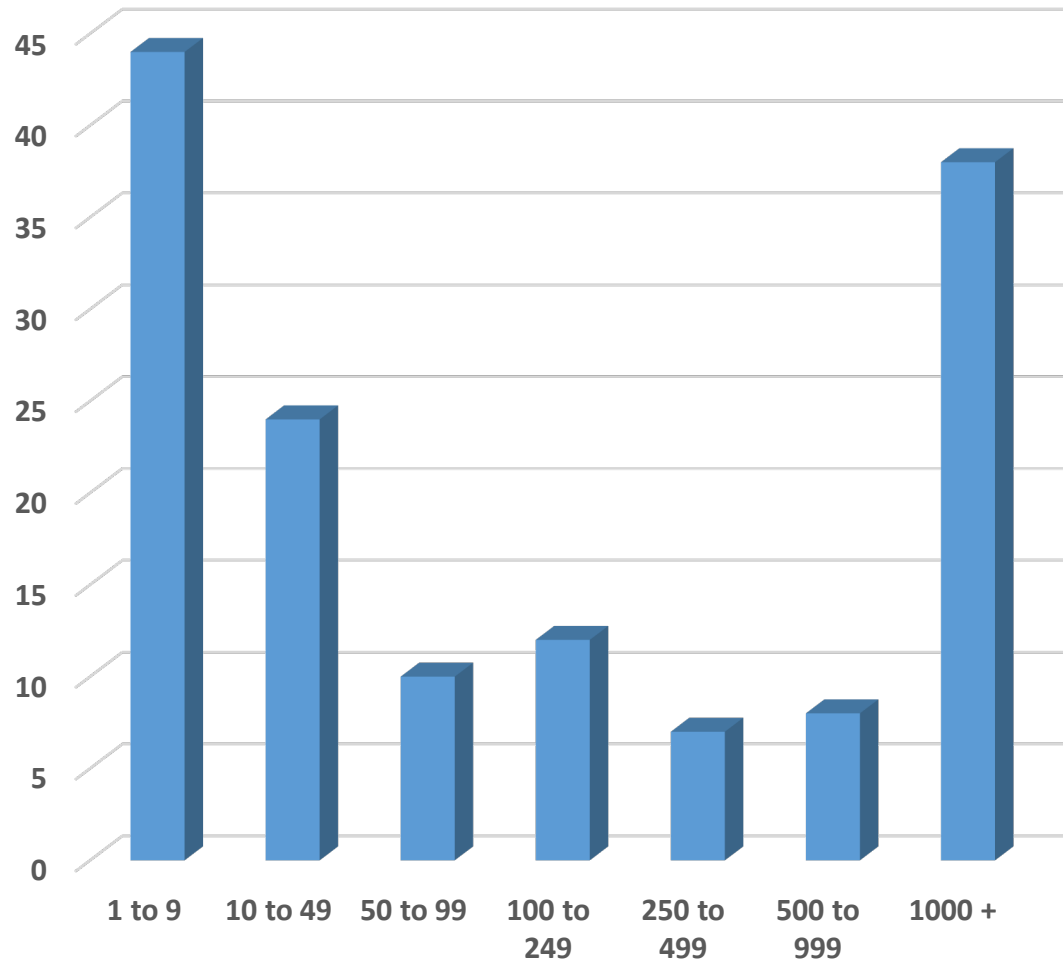
Respondents were asked to describe the type(s) or organisation they worked for and its size and location. The largest group responding by a significant margin were people working in universities and research institutes.

# Which of the following types of organisation best describes your organisation?

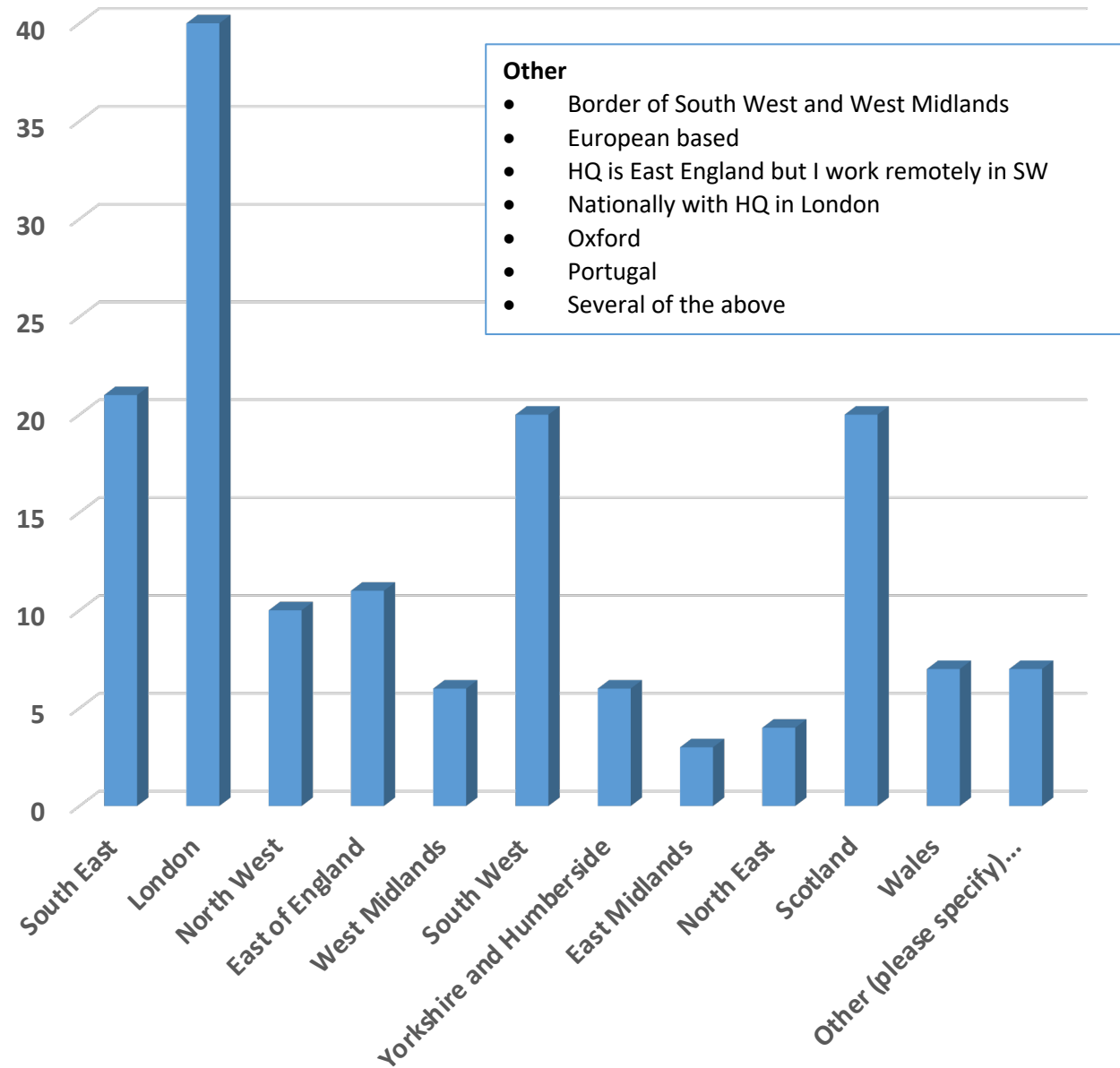


- Other**
- Café Scientifique
  - Government - aspects of funder and policy
  - I run a PE project funded by Wellcome. I have 3 staff at the moment, but when the project is over I will revert to a sole trader
  - Independent scientist
  - Just me!
  - Medical research charity
  - NHS
  - Non-profit independent research organisation
  - Retired
  - Scientific Society
  - Self-employed artist facilitator
  - Several of the above. Why can I only choose one?
  - Stem Ambassador
  - STEMNET
  - Tour Guide
  - We are both an international research institute and a museum. Neither single category adequately describes the institute

## How many employees work for your organisation?



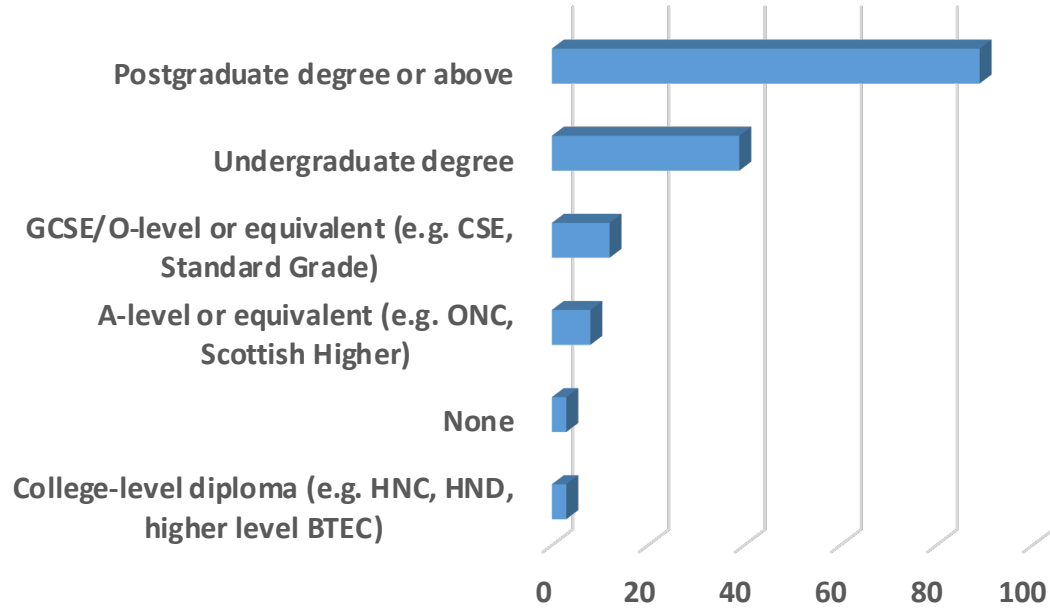
## Where is your organisation based?



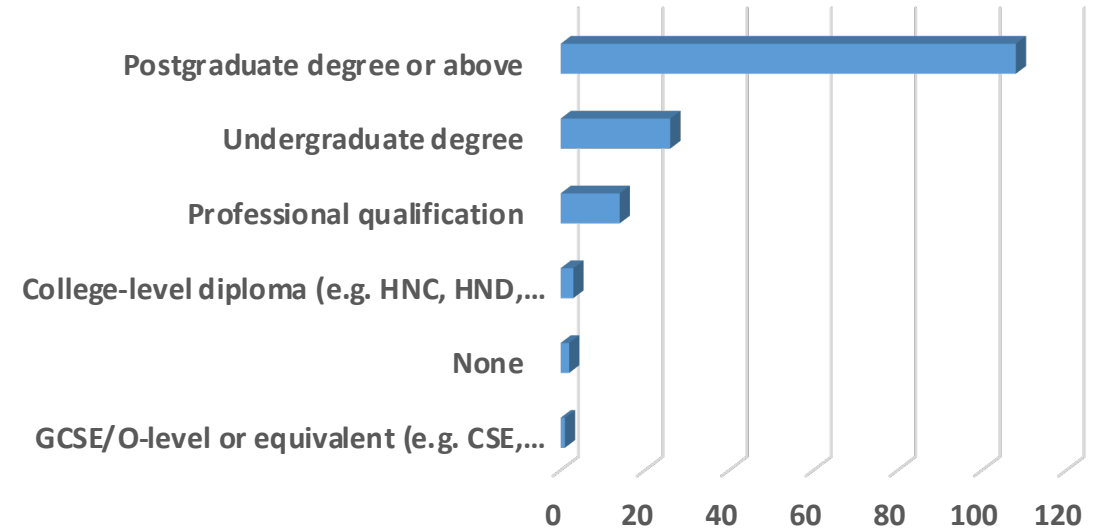
# Their qualifications

Respondents were invited to describe their STEM/ non-STEM and professional qualifications. More than half (88) had a postgraduate degree or above. 61 have a formal qualification that supports their public engagement

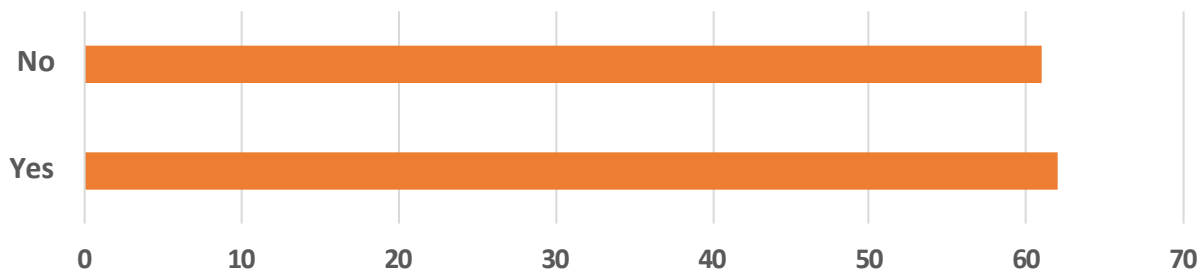
## What is your highest STEM qualification?



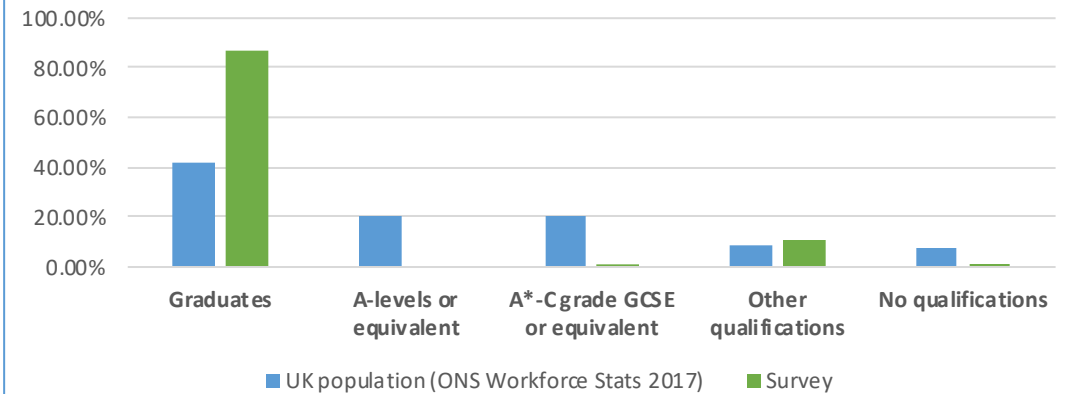
## What is the highest qualification you have in any area?



## Do you have a formal qualification that you feel supports your public engagement?



## UK comparison: What's the highest level of qualification you have in any area?



## Formal qualifications that people identified as supporting their work in public engagement

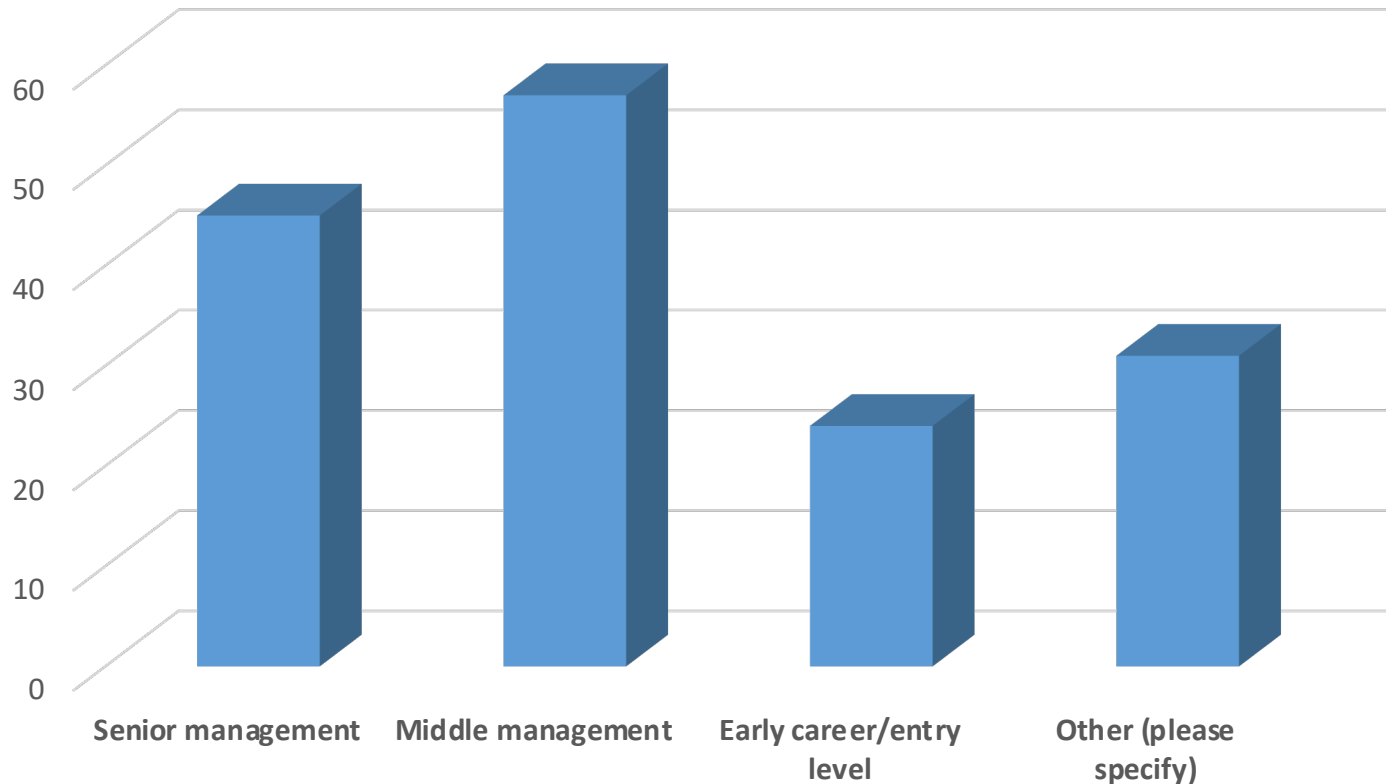
Topic	No.	Typical comment
Other PhD/Degree	36	<ul style="list-style-type: none"> <li>• BSc in History and Philosophy of Science, Post Grad qualifications in museum management</li> <li>• PhD - doesn't matter what it is in. This is (wrongly in my opinion) still held as a requirement in my role working with academics.</li> <li>• MSc Education Management, Dip Sci, BSc, QTS,</li> <li>• PhD Development Scholarship in Public Engagement</li> <li>• BSc in Geology and Geography</li> <li>• Public Archaeology</li> </ul>
Science Communication	20	<ul style="list-style-type: none"> <li>• MSc in Science Communication</li> <li>• PhD in science communication</li> <li>• Graduate Diploma in Science Communication</li> <li>• Short online science communication course</li> </ul>
PGCE/QTS	17	<ul style="list-style-type: none"> <li>• I am a teacher so have a PGCE.</li> <li>• PGCE in Early Years Teaching (specialising in learning through play)</li> </ul>
Museums Education / Outreach	5	<ul style="list-style-type: none"> <li>• MA museum studies</li> <li>• Masters in Museums and Galleries in Education</li> <li>• MA in Museum Studies</li> </ul>
Other	4	<ul style="list-style-type: none"> <li>• National Qualification in Journalism (NQJ)</li> <li>• Training for trainers</li> <li>• Coaching accreditation</li> </ul>



# What roles do they play?

The sample was weighted towards those in senior or middle management roles. The dominant roles played were to either plan and deliver public engagement; or to support others to do so

## Which of the following best describes your current role? (if you are a volunteer or freelance choose the level that is appropriate to your role's responsibilities)

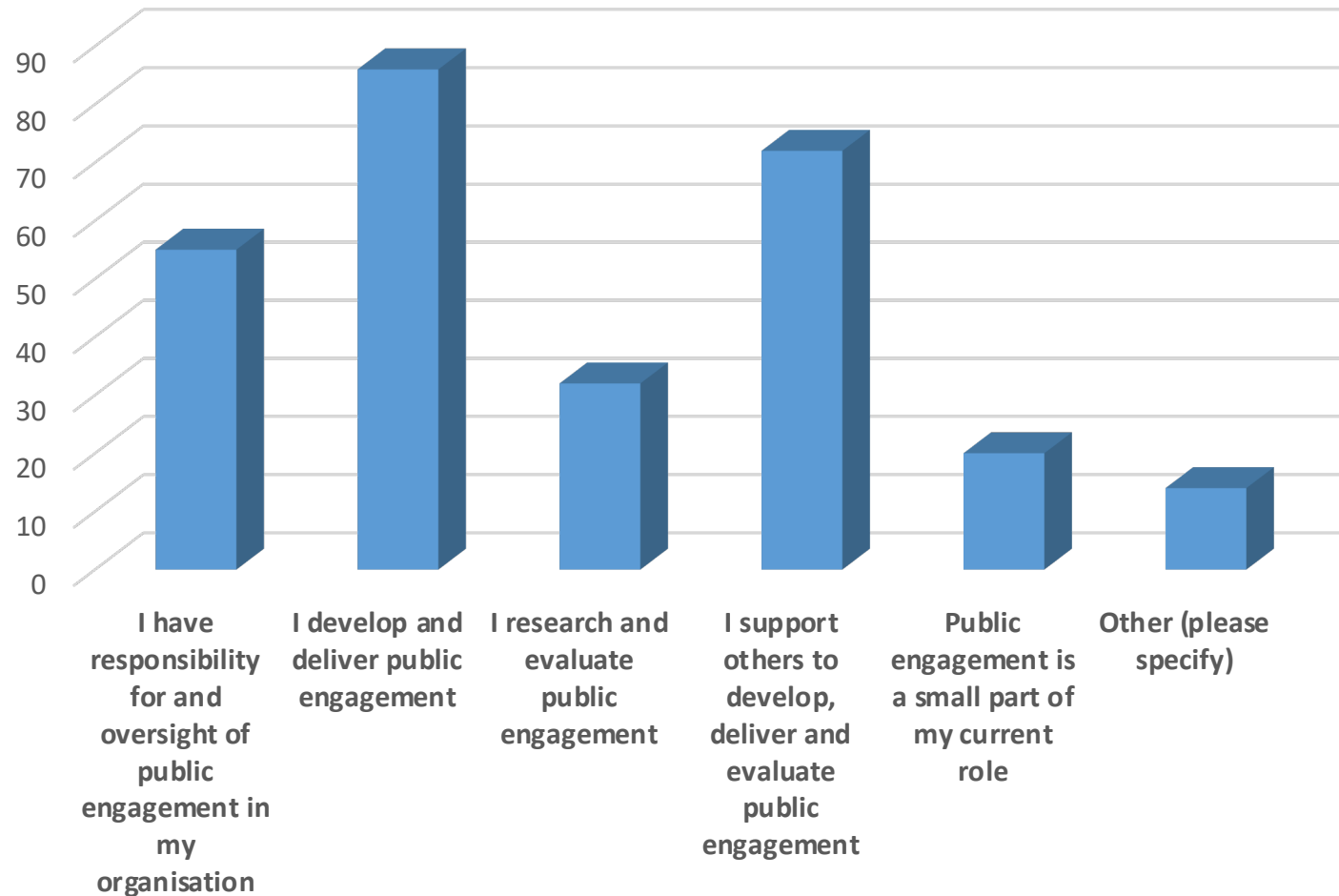


### Other

- Public engagement is the main part of my role, but I work at a large university so I am not "key" to whole institution
- My role mixes the first four - maybe allow people to tick several?
- I don't spend more than half of my time on public engagement but do spend a significant amount of my time on STEM for outreach
- All of the above (except the small part bit)
- As a dynamic and strategic leader I make sure I am able to work across all of the above as a practice-based researcher
- I have responsibility and oversight for specific public engagement projects within my organisation
- Doing science research with young people in school
- I am a science researcher, doing public engagement on the side
- Public engagement is a small (in time) but very important part of my role!
- I "do" public engagement. I do not research or evaluate or develop. I do it.
- I am one of 3 members of staff with a public engagement component in their job role
- I do similar work on STEM Inspiration and equality and diversity in the STEM workforce.
- PE is not part of my role but an 'optional' extra
- I also have responsibility for general administration and operations-related tasks

## Which of the following statements best describes the primary focus of your role?

Please only select those that are the primary focus of your role (e.g. you spend more than half your time on).

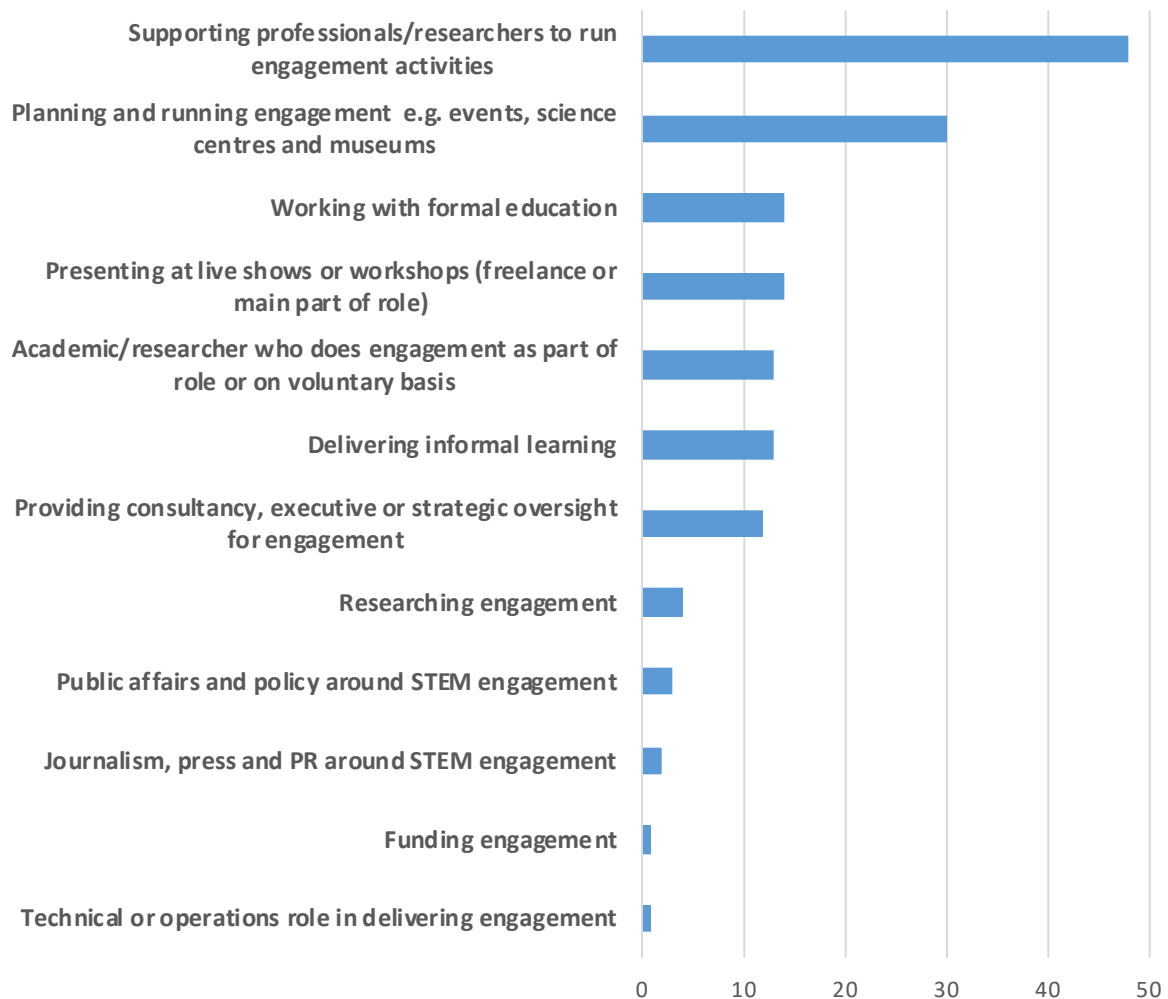


### Other

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- As a dynamic and strategic leader I make sure I am able to work across all of the above as a practice-based researcher
- Doing science research with young people in school
- I "do" public engagement. I do not research or evaluate or develop. I do it.
- I also have responsibility for general administration and operations-related tasks.
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- PE is not part of my role but an 'optional' extra
- Public engagement is a small (in time) but very important part of my role!
- Public engagement is the main part of my role, but i work at a large university so I am not "key" to whole institution

# Please explain how you are involved in public engagement in STEM (open response)

Respondents were asked to explain how they were involved in public engagement with STEM. Most respondents outlined the key responsibilities for their role.

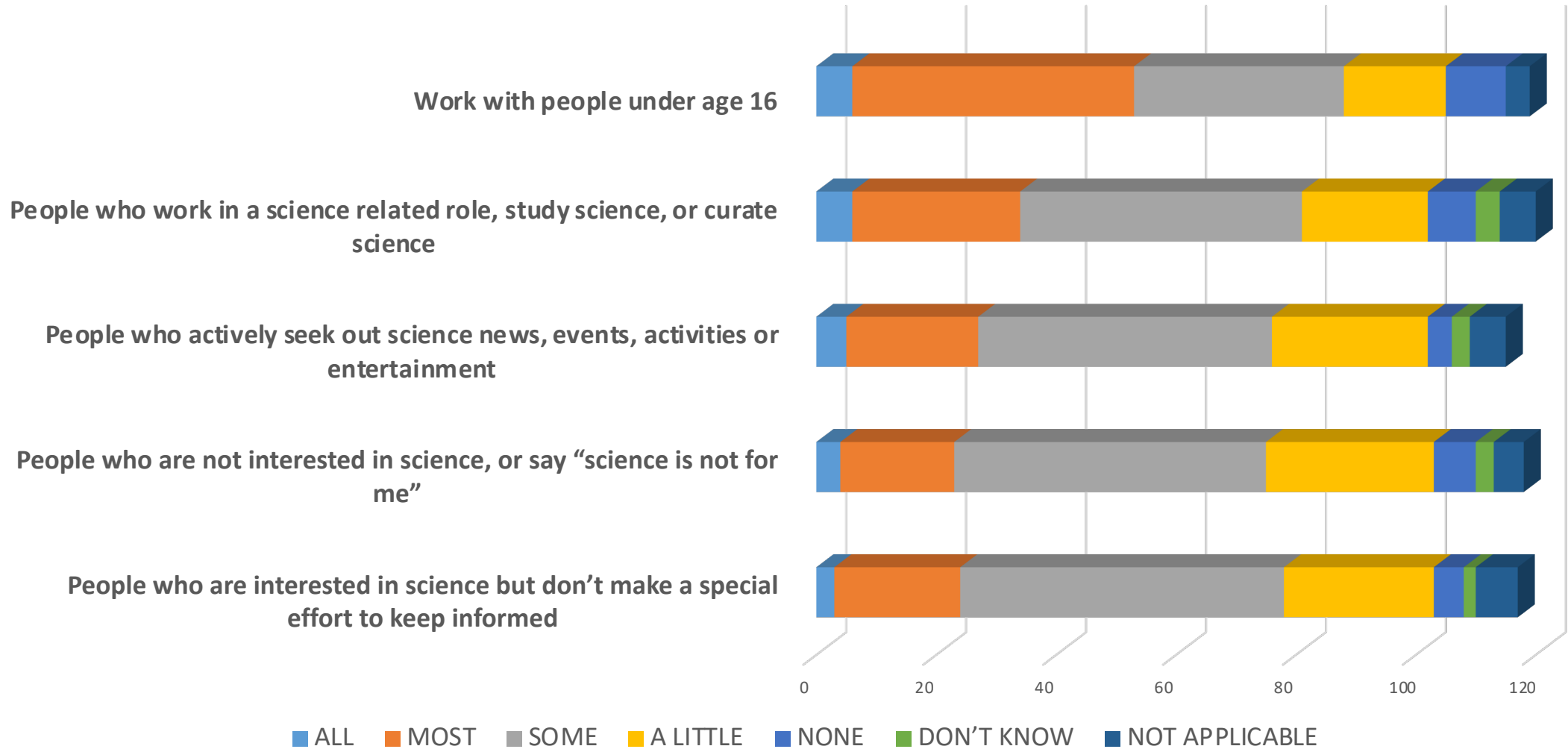


Topic	No.	Typical comment
Supporting professionals	48	<ul style="list-style-type: none"> <li>I support researchers to communicate to and engage with publics about their work. I also run a public-facing programme that shares STEM research through online media, that is created in collaboration with researchers.</li> </ul>
Planning and running engagement	30	<ul style="list-style-type: none"> <li>I work as a learning and participation manager - working to develop our engagement practice and broaden our audiences</li> <li>I describe myself as a public engagement practitioner. At present I run a project where we get non-scientists and scientists working together and collaborating on user-led citizen science.</li> </ul>
Presenting live shows/workshops	14	<ul style="list-style-type: none"> <li>I am a presenter/science communicator with a mobile sci-com company, who offer a variety of science shows and workshops.</li> </ul>
Working with formal education	14	<ul style="list-style-type: none"> <li>I run education programmes designed to encourage young people to explore STEM careers and interests and to maintain their enthusiasm for STEM as they go through secondary school</li> </ul>
Delivering informal learning	13	<ul style="list-style-type: none"> <li>We are an embedded University Museum. I communicate directly with the public through the delivery of our schools programme, informal family learning programme, outreach and access programme.</li> </ul>
Academic researcher who does engagement	13	<ul style="list-style-type: none"> <li>I became a STEM ambassador and occasionally organise events to promote science and in particular my department.</li> </ul>
Strategy/consultancy	12	<ul style="list-style-type: none"> <li>We work as consultants, audience researchers and content developers for STEM organisations, mainly ones that use an arts or cultural approach.</li> </ul>
Researching engagement	4	<ul style="list-style-type: none"> <li>I teach and research aspects of public engagement. I also occasionally deliver PE.</li> </ul>
Policy or public affairs	3	<ul style="list-style-type: none"> <li>Behind the scenes in the public affairs team which incorporates outreach activities</li> </ul>
Journalism, press or PR	2	<ul style="list-style-type: none"> <li>My job title is Communications &amp; Marketing Manager. I do our own PR including planning publicity campaigns, writing press releases and items for external newsletters, as well as our internal content for our website and social media platforms. In addition I deliver science communications training, specialising in communicating with non-technical audiences for early career researchers.</li> </ul>
Technical roles	1	<ul style="list-style-type: none"> <li>I design and make mechanical and electro-mechanical hands-on interactive exhibits for science centres and museums. I also write and present science shows, and I also design and make bespoke props for other science show and workshop presenters.</li> </ul>

# The audiences they work with

There was a strong focus on working with under-16s and on working with audiences already motivated by or involved in science.

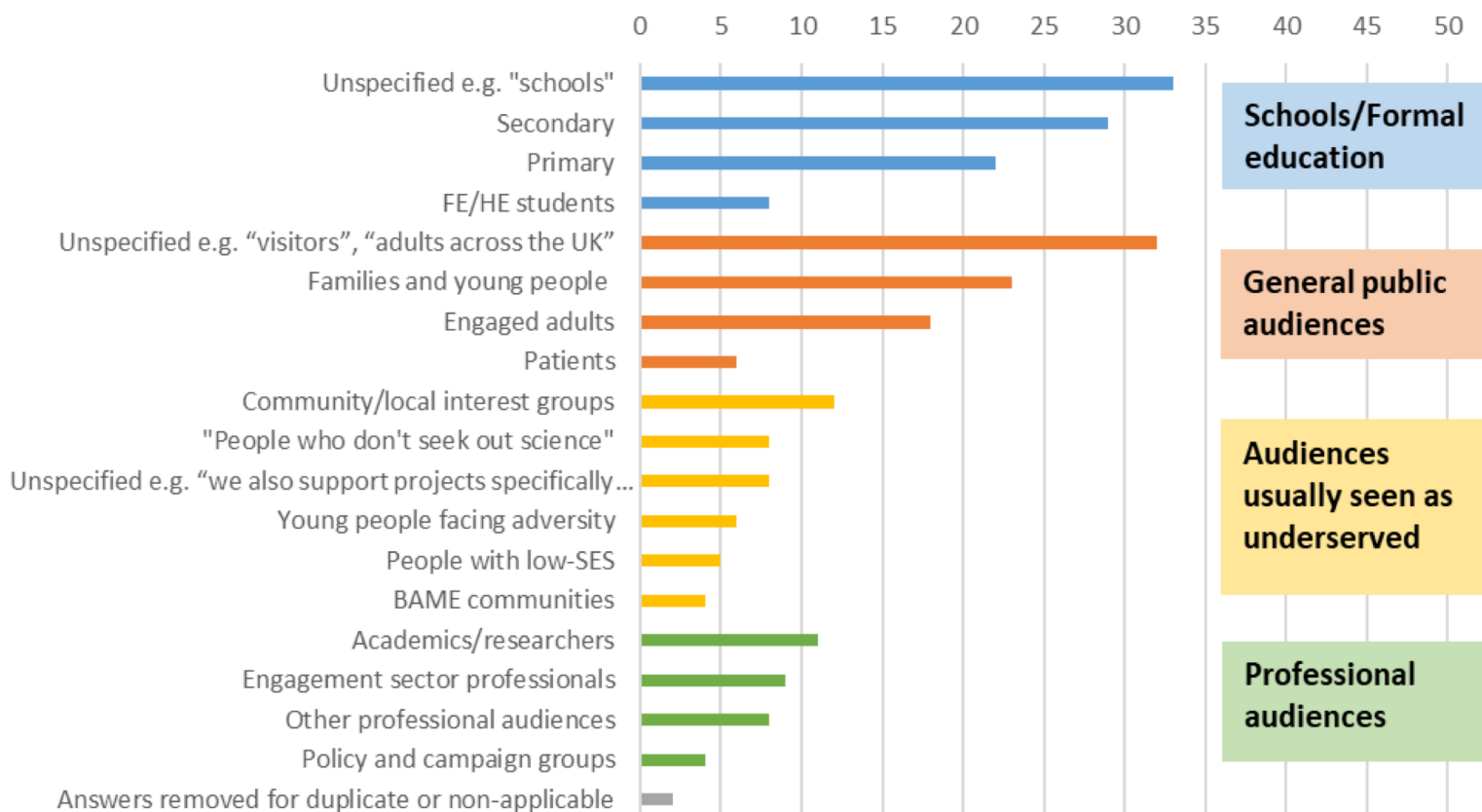
## Approximately what proportion of you/your organisation's work with adults is directed at each of the following groups?



## Please use this space to tell us more about the audiences you engage with (open response)

Respondents had the option to explain more about the audiences they engage. Almost all respondents named multiple audiences which is reflected in the coding.

### Please use this space to tell us more about the audiences you engage with



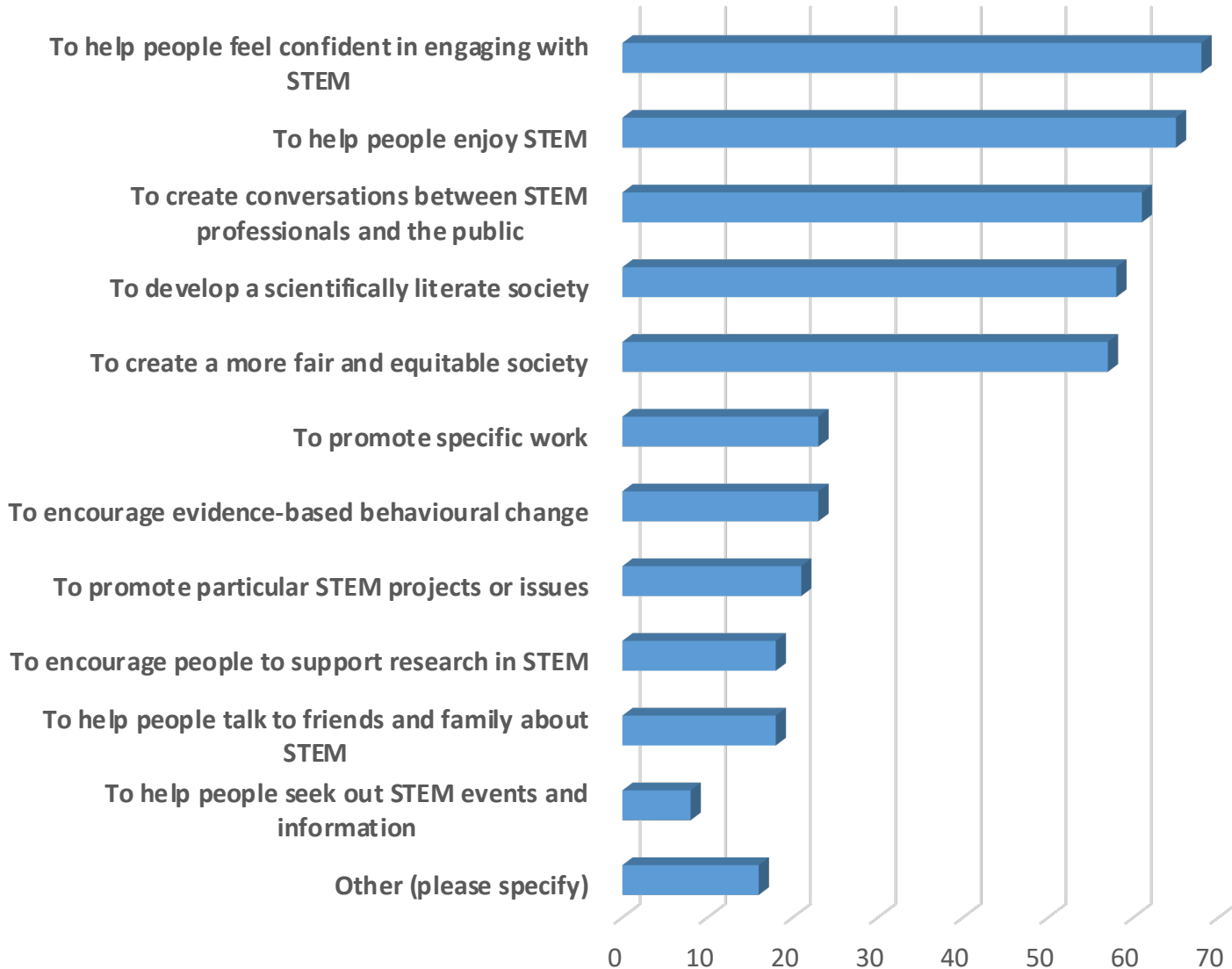
Topic	No.	Typical comment
Schools and formal education	92	<ul style="list-style-type: none"> <li>Primary age children and families. We are also planning to move into comprehensive age groups.</li> <li>My role is to teach facilitated session in the museum, mostly primary age children in school groups but also primary age home education groups. I teach fewer secondary age school groups.</li> </ul>
General public audiences	79	<ul style="list-style-type: none"> <li>Our regular audience is largely families with children under the age of 12. We also engage with adults in evening events,</li> <li>We engage patients as our research is all about medical imaging - mainly linked to diseases research focuses on eg cancer, heart, neurological conditions. So we engage the people that are directly impacted by the research as well as their families. We also engage the local population that live near to our university as they are keen to know what is happening on their door step.</li> </ul>
Audiences usually seen as underserved	43	<ul style="list-style-type: none"> <li>We work with deprived communities in West Yorkshire. We work in community settings rather than expecting people to travel to venues where they may not feel confident or comfortable. We find that that working with community practitioners and artists alongside scientists or technicians works best.</li> <li>Our primary audience are under-represented young/mature people (those in POLAR 1-2 postcodes; with less than 25k household income, no parental HE, care leavers, specific BAME groups and young carers). Our target groups are informed by the OfS Access and Participation Plan Guidance which was released in February 2018, and is under consultation.</li> </ul>
Professional audiences	32	<ul style="list-style-type: none"> <li>Overworked STEM communication volunteers and professionals who don't have extensive experience and/or time to keep up with developments in the field, and/or staff to develop specific projects.</li> </ul>

# The aims of their engagement activity

Five broad aims dominated: to build confidence, enjoyment and scientific literacy; to stimulate conversation about science; and to create a more fair and equitable society



## Thinking about the audiences you engage with what are your top three aims?



### Other

- to bring different knowledges into the academic research environment
- We do all of these where ever possible
- to develop a scientifically literate public that is able to critique and shape STEM agendas
- To reduce talk about 'stem professionals' vs 'the public', as this is othering and artificially creates two groups.
- Developing future science communicators who are able to engage with the broad underpinnings of the field.
- Provide support for career choices in STEM
- To change science and scientists.
- Enabling publics to be involved in the research process.
- To translate environmental data research and climate services into every day language and every day news; engage decision makers
- To challenge some of the stereotypes that exist and open up opportunities around STEM to a more diverse set of people
- To encourage under-represented groups to consider university to study science related subjects
- to develop a society of people who are empowered to ask questions
- Interested in developing a conversation around health and arts
- to give people a stake in the stem issues relating to climate action; to create conversations about stem between the public
- To encourage and support STEM professionals who have undertaken a career break back into meaningful STEM research careers
- To create conversations between STEM professionals, policy makers and the public

# Challenges in their roles

Unsurprisingly, perhaps, lack of time, money and resources were major challenges. Also significant was the lack of influence and strategic support reported by many respondents

## What is the key challenge you face in your role? (open response)

Respondents were asked to identify the key challenge they faced in their role, and what one thing might help to address that challenge. The responses clustered as follows.



Topic	No.	Typical comment
Lack of time / resources	35	<ul style="list-style-type: none"> <li>• Chief challenge is time constraint: I need 27 hours in a day.</li> <li>• Time; it's always a balance between clinical service and public engagement</li> </ul>
Lack of influence / strategic support	35	<ul style="list-style-type: none"> <li>• Funding and influence. I often feel ignored by everyone that has any significance or influence within organisations with which we deal</li> <li>• Consistent engagement and direction from head of organisation</li> <li>• Lack of clear organisational strategy</li> </ul>
Lack of or poorly targeted funding	33	<ul style="list-style-type: none"> <li>• Lack of a comprehensive and integrated funding landscape</li> <li>• Dealing with the prevailing dogmas of funders. e.g. thinking that you need to define an audience very tightly, when actually it usually works very well mixing people up.</li> </ul>
Lack of capability / skills / understanding	26	<ul style="list-style-type: none"> <li>• It would help A LOT if there was better training in courses in STEM engagement about the use of interactive exhibits/props and best practise in their procurement.</li> <li>• Crowd control! Courses on ways to deal with children misbehaving maybe....or just good ways to respond that allow the show to continue without alienating said child</li> <li>• Grasping the fine details of what really contributes to meaningful engagement.</li> </ul>
Changing the culture of science	17	<ul style="list-style-type: none"> <li>• The slow pace of culture change in universities. The Outreach Officer role, and the funding provided by the Trust, are used to try and leverage the department to speed up the process of change and embedding it.</li> <li>• Scientists. Some are completely great. Some of them still have 1950s thinking about 'the public'. They just don't get that PE should be a two-way process and that they might learn something and their science might be improved by letting the public in. They don't value PE, other than as a form of PR for science.</li> </ul>

Cont'd over

## What is the key challenge you face in your role? (cont'd)

Weak partnership working / networks	17	<ul style="list-style-type: none"> <li>• Understanding where my work as a museum educator fits in alongside "other" science communication and public engagement; I've not had much contact with other professionals working in more overtly STEM organisations and am not sure I fully understand why we don't seem to work together more when there are fantastic collaborative opportunities out there.</li> <li>• More time for strategic thinking and partnership building</li> </ul>
Fragmented sector / lack common purpose	10	<ul style="list-style-type: none"> <li>• The scrappiness of the sector. Projects are so specific to particular messages/audiences that is difficult to archive learning in a way that it can be accessed to inform future projects. Things are constantly re-invented / the same errors made rather than building things on previously laid foundations.</li> <li>• I would like to see much clearer and more joined-up science engagement offers across sectors so we can share audiences and direct them more effectively to next step engagement opportunities elsewhere (i.e. if you liked this, why not try...) and- particularly within the museums sector- for science to be given an equal emphasis and value to Arts by funders.</li> </ul>
Lack of consistent definitions / standards	9	<ul style="list-style-type: none"> <li>• Too much uncertainty and mixed messages from large funders</li> <li>• Schisms in the community over what the purpose of engagement is and what good engagement is</li> <li>• Snobbery over the engagement of schools</li> <li>• Formal recognition of quality. There's some rubbish out there. How are teachers to know they can trust their tiny precious budget to your skills?</li> </ul>
Inadequate evaluation	6	<ul style="list-style-type: none"> <li>• Demonstrating the difference that engagement makes - it's so intangible.</li> <li>• Getting enough support and appropriately evaluating the work of the project and wider departmental public engagement.</li> <li>• I'd be very interested in a standard approach to assessing our audience's relationship with science e.g. science capital / BSA zone model, with an understanding of their proportions in national and local populations</li> </ul>
Racism / diversity	2	<ul style="list-style-type: none"> <li>• Racism and unconscious bias, sexism and a lack of awareness of the value of intersectional leadership on public engagement with STEM. What works for the mainstream rarely works for those marginalised from the mainstream and yet marginalised perspectives can often be a point of creativity and innovation in STEM</li> <li>• Getting people are on board with the importance of diversity and inclusion in public engagement (whether that be behind the scenes, on stage or in the audience), getting people to change their programmes and way of thinking in terms of their approach to developing activities/events is difficult</li> </ul>

# Support for professional development

Most respondents named multiple organisations, events and networks – with networks and conferences proving to be particularly important

## Where do you go to for support for professional development? (open response)

Respondents were asked to explain where they go for professional and career development. Most respondents named multiple organisations, events and networks which is reflected in the coding. There weren't enough mentions of individual networks to separate them as sub-categories



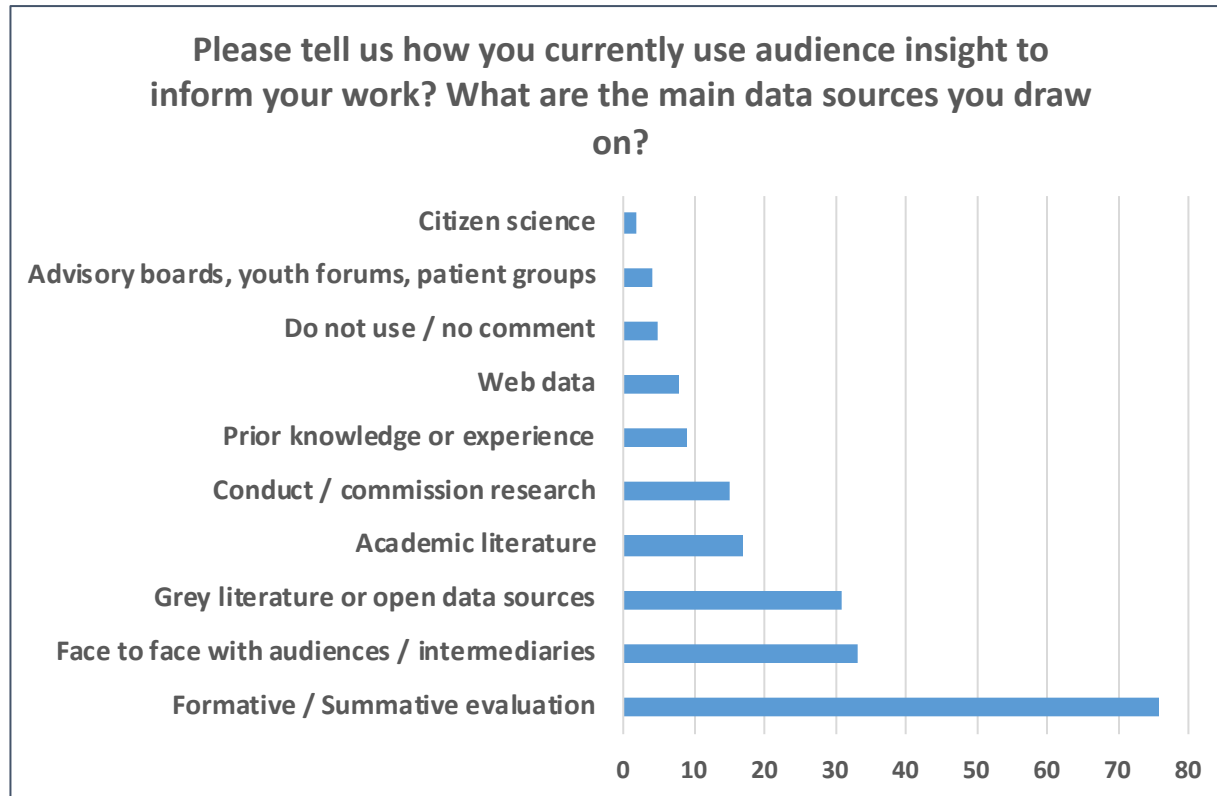
Topic	No.	Typical comment *Comments marked are a section of a longer response
Conferences	104	<ul style="list-style-type: none"> <li>*Attending conferences - e.g. Engage, ASDC, UKSFN</li> <li>*Conferences and networks are important - BIG, ECSA, CSA, ASDC</li> <li>Across the team we attend the following organisations' conferences and events on a regular basis: BIG, ASDC, ASE, PSTT, PyCon, Presenter Network, Careers Enterprise Company (CEC).</li> </ul>
Training and CPD	35	<ul style="list-style-type: none"> <li>Training and conferences from other fields. E.g. Craft Council, health research methodologies</li> <li>I have had fellowships at key points in my career. I have postgraduate certificates in academic practice. I have paid for a coach in the past and am trained as a coach. Most conferences lack culturally diverse speakers so I am more focused on attending those who demonstrate leadership in this area. My social enterprise or research grants support my professional development or I pay for it myself.</li> <li>*I have found training on Arts mark and the Arts Award insightful to understanding schools prioritises when seeking out of classroom learning, and this has helped shape our offer to match more closely with some of these criteria.</li> </ul>
Other sources	136	<ul style="list-style-type: none"> <li>*STEM specific Parliamentary and policy events, APPGs, select committees et al. Higher education and STEM networks, conferences and events</li> <li>*I am a member of BIG (British Interactive Group) and post on their forums as well as attending the conference; I Post on PSCI-COMM; I use LinkedIn and twitter to keep up with current issues; I subscribe to New Scientist for updates.</li> <li>*And other networking opportunities such as Science Week, Ada Lovelace Day, Fun Palaces</li> <li>*Grey literature: Public Attitudes survey, NCCPE reports, reports from learned societies etc; Peer learning</li> <li>Learning by doing, best practices of others and exchange with other professionals e.g. PE unit at UCL and through network events, conferences and papers</li> </ul>

# Using audience data

A number of questions explored approaches to evaluation and uses of audience insight and data. The responses revealed a strong reliance on questionnaires and informal feedback mechanisms. There was a strong push for more investment in longitudinal studies and programme level research, and in investment in making better use of existing audience data

## Please tell us how you currently use audience insight to inform your work? What are the main data sources you draw on?

The survey moved on to explore how respondents approached evaluation and audience development, and started by asking them how they used audience insight, and about the data sources they draw on in their work.



Topic	No.	Typical comment
Formative / Summative Evaluation	76	<ul style="list-style-type: none"> <li>Feedback at events is the most common source of audience insight. The best question we have used that offers support to our activities is "If this event wasn't free would you still attend?"</li> <li>Interviews with teachers, parents, children and head teachers.</li> <li>We evaluate every public facing event we do using evaluation forms/online surveys. The data collected from these is used to inform future events.</li> <li>I use a variety of questionnaires related to our events to identify what elements about our activities work best, and what people are interested in.</li> </ul>
Face to face with audiences / intermediaries	33	<ul style="list-style-type: none"> <li>If possible, by talking to said publics to find out what would work for them.</li> <li>We talk to ordinary people. Our practitioners focus on making participants feel welcome. comfortable, like they belong - this means that they feel comfortable and that their opinion is valued.</li> <li>Discussions with teachers</li> <li>Observations on the exhibition floor, minimal evaluation.</li> <li>I rely on my children to assess what is appropriate for their age group</li> <li>Informal and formal networking with other local organisations.</li> <li>Working with advocates from particular groups to find out their interests and needs</li> </ul>
Grey literature or open data sources	31	<ul style="list-style-type: none"> <li>PAS survey data / Wellcome Monitor</li> <li>ASPIRES</li> <li>The UK STEM Education Landscape by RAEng</li> <li>Data from DfE surveys for pupils and teachers.</li> <li>British Science Association public attitudes to science survey and audience segmentation work</li> <li>IPSOS Mori profiling</li> </ul>



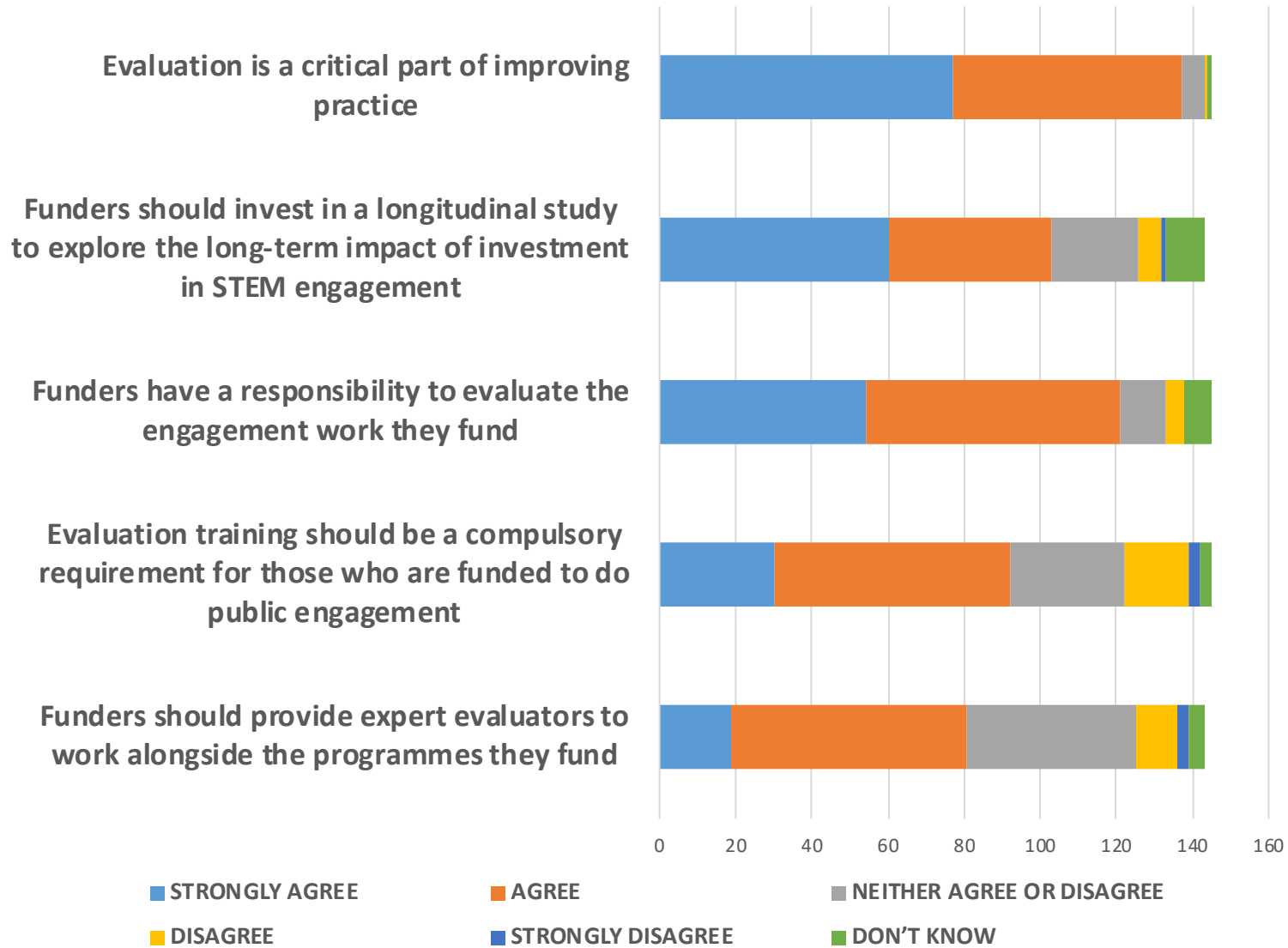
## Please tell us how you currently use audience insight to inform your work? What are the main data sources you draw on? (cont'd)

Topic	No.	Typical comment
Academic literature	17	<ul style="list-style-type: none"> <li>Regularly review literature to gain insight into our audiences understanding of our narratives.</li> <li>Journal articles can sometimes be of help in thinking about new ways to engage, too.</li> <li>I have also read various journal articles about public engagement related to young people (mainly in the field of science education if I'm honest), due to my PhD efforts.</li> <li>Always a mix - some social science (e.g. Cardiff psychology, KCL sci education...)</li> </ul>
Conduct / commission research	15	<ul style="list-style-type: none"> <li>Extensive BBC audience surveys both pre and post broadcast.</li> <li>Extensive In-house consumer research into public and charity supporter attitudes and knowledge sets the direction</li> <li>Survey our target audience every two years. Also use a variety of other research tools to engage with them to understand their requirements and attitudes/confidence/aspirations/engagement with STEM.</li> </ul>
Prior knowledge or experience	9	<ul style="list-style-type: none"> <li>I mostly go from personal experience of working with our audiences.</li> <li>I know what works with the communities that I work with. I know how to approach certain subjects e.g. evolution, with religious groups. I think this only comes from experience, but also knowing the key people within those communities and building a trustworthy relationship with them.</li> <li>I use myself and my friends.</li> </ul>

Topic	No.	Typical comment
Web data	8	<ul style="list-style-type: none"> <li>On-line social (and other) media comment</li> <li>Analytics of website</li> <li>Trip advisor</li> </ul>
Do not use / No comment	5	<ul style="list-style-type: none"> <li>N/a</li> </ul>
Advisory boards, youth forums, patient groups	4	<ul style="list-style-type: none"> <li>We have a Youth Forum where we discuss ideas or offer a topic and ask how they would wish to engage with it or where they would take it. They can also suggest topics. This is often very different from what we might suggest.</li> <li>Patient groups / focus groups help shape and sense check ideas.</li> <li>We involved young people as consultants and also run focus groups.</li> </ul>
Citizen Science	2	<ul style="list-style-type: none"> <li>Citizen Sciences is a great vehicle but is best where there is real value in what is being produced not just a vehicle for people to feel involved.</li> </ul>

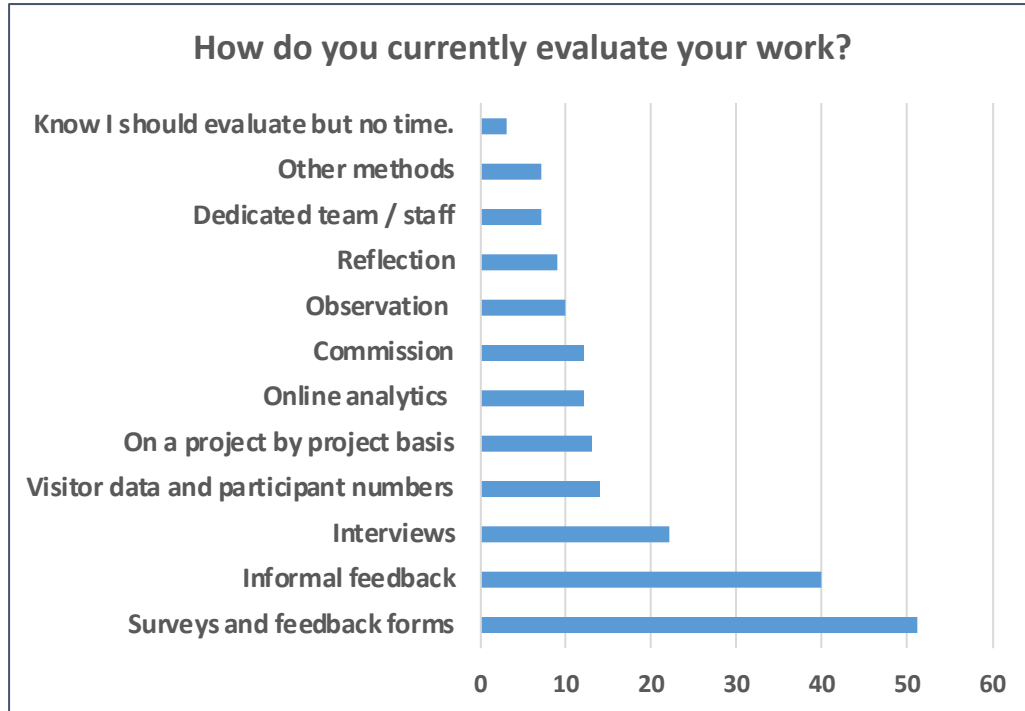
# Approaches to evaluation

# How much do you agree with the following statements about evaluation



## How do you currently evaluate your work? (open response)

Respondents were invited to explain how they approached this. The use of surveys / questionnaires and informal feedback dominated.



Topic	No.	Typical comment
Surveys and feedback forms	51	<ul style="list-style-type: none"> <li>• Face to face and online questionnaires on satisfaction levels</li> <li>• Evaluation forms &amp; reports. We include the British Science Association zoning questions &amp; demographic questions (such as ethnicity, gender, etc.).</li> <li>• Pre- and post- project questionnaires (online and in person).</li> <li>• Mainly through the use of post-event questionnaires.</li> </ul>
Informal feedback	40	<ul style="list-style-type: none"> <li>• Did audience look happy? Did they ask questions or hang around to chat? Was anybody particularly enthusiastic afterwards?</li> <li>• I judge the effectiveness of what I do by a) audience reaction on the day, b) from unsolicited thank you letters, notes and occasional gifts.</li> <li>• I count the number of 'wows' and 'cheers' I get during and after a presentation.</li> <li>• Ask for feedback from the kids and their parents and teachers.</li> </ul>
Interviews	22	<ul style="list-style-type: none"> <li>• We use monthly exit interviews</li> <li>• I will be conducting interviews with attendees to transcribe and analyse.</li> <li>• We have an MSc student doing in-depth interviews with a representative sample of group members.</li> </ul>
Visitor data and participant numbers	14	<ul style="list-style-type: none"> <li>• Number of people attending</li> <li>• On a project by project basis as well as using ongoing visitor data (ALVA, MHM, visitor kiosks).</li> <li>• Through data analytics on figures of those engaged and any public information on them e.g. % free school meals of those schools engaged.</li> </ul>

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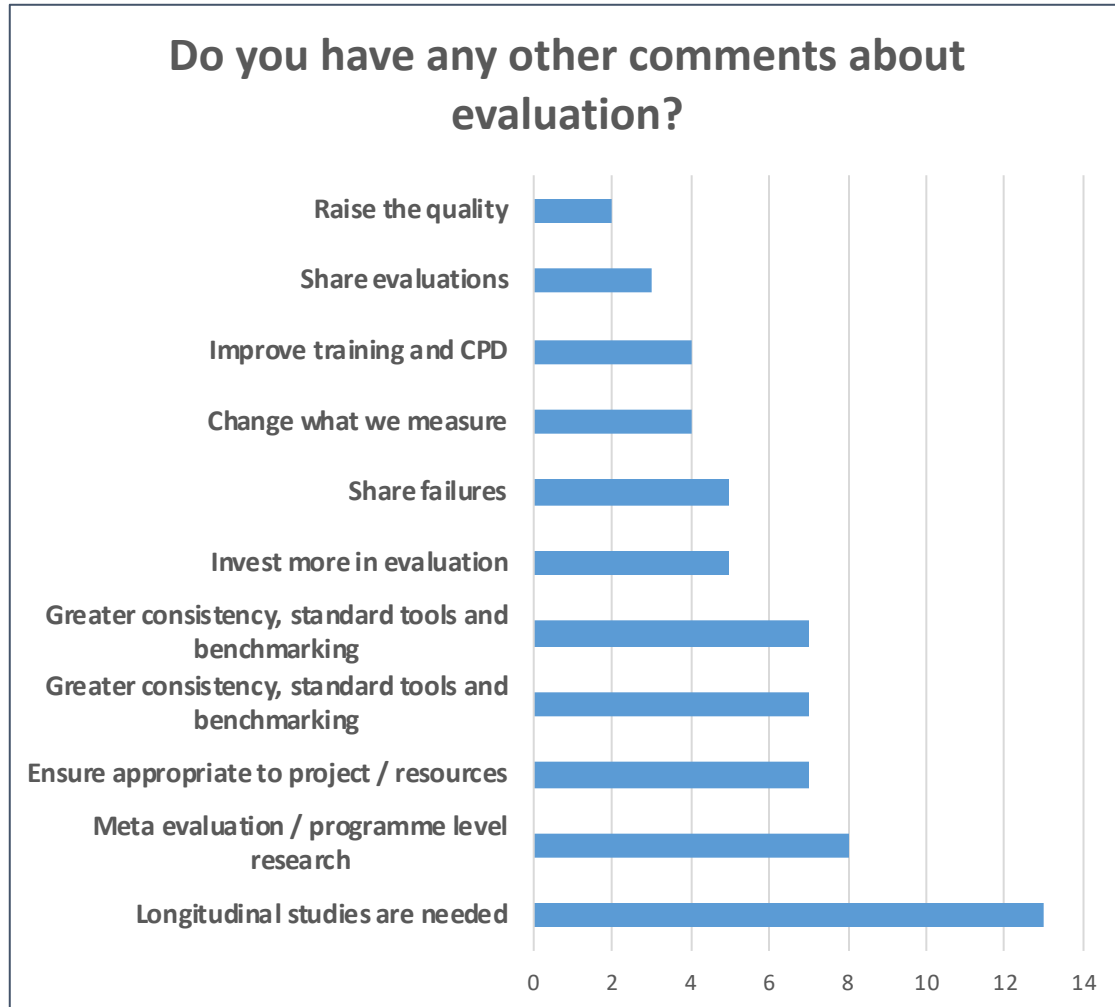
## How do you currently evaluate your work? (cont'd)

Topic	No.	Typical comment
On a project by project basis	13	<ul style="list-style-type: none"> <li>This very much depends on the scale of the project, the project itself and the resource available. For small projects this might be based on reflection and easy-win feedback methods based on objectives. For bigger projects we undertake a theory of change, employ a range of methods, and engage an individual with specific responsibility to carry out this work. Both formative and summative. Often struggle with long-term follow-up.</li> <li>We embed evaluation at the planning stage of the project. At which time the methodology for the evaluation would be agreed so that it is appropriate and proportionate.</li> </ul>
Online analytics	12	<ul style="list-style-type: none"> <li>Twitter feedback</li> <li>We look at social media analytics every 3 months</li> <li>Loads of data from the Facebook groups to analyse with engagement stats and also textual analysis of posts/comments.</li> </ul>
Commission	12	<ul style="list-style-type: none"> <li>We employ a freelance evaluator</li> <li>The first five years of the project was externally evaluated</li> <li>Bespoke surveys are commissioned from consultancies</li> </ul>
Observation	10	<ul style="list-style-type: none"> <li>Visitor observational info if an exhibit style activity</li> <li>Count numbers of interactions at events</li> </ul>
Reflection	9	<ul style="list-style-type: none"> <li>We try to make time to reflect on our own practice, and to write about it, so that there is continuity from project to project.</li> <li>Did audience look happy? Did they ask questions or hang around to chat? Was anybody particularly enthusiastic afterwards? Did event justify effort/resources put into it? Do you get asked back to do more?</li> <li>Reflective practice of staff involved</li> </ul>

Topic	No.	Typical comment
Dedicated team / staff	7	<ul style="list-style-type: none"> <li>We're very lucky to have had a dedicated audience research team for over 20 years within our organisation.</li> <li>The museum has internal specialist in evaluation and there is an internal cross-museums audience evaluation unit that captures and analyses data</li> </ul>
Other methods	< 7	<ul style="list-style-type: none"> <li>Focus groups (7)</li> <li>Sticky walls / stickers (7)</li> <li>Repeat business (7)</li> <li>Logic model / theory of change (6)</li> <li>Formal reports (6)</li> <li>Science Capital (3)</li> <li>GLO (2)</li> <li>BSA tools (2)</li> <li>BBC (1)</li> <li>Communities of practice (1)</li> </ul>
Know I should evaluate but no time.	3	<ul style="list-style-type: none"> <li>We do not as yet do a much evaluation at all. I think this is because I am yet to be convinced that any evaluation methods on the scale of what the funders are currently suggesting are the time frames over which the projects should be funded for will produce any meaningful data whatsoever.</li> <li>Again, I haven't and I should. I recently attended a workshop geared towards this and can now draw on the resources provided in that to start.</li> <li>Long running activities are rarely if ever evaluated.</li> </ul>

## Do you have any other comments about evaluation? (open response)

Respondents were asked for any other comments or reflections about evaluation. There was strong support for a more strategic approach to evaluation, including investment in longitudinal studies and more programme level research



Topic	No.	Typical comment
Longitudinal studies are needed	13	<ul style="list-style-type: none"> <li>• There is never enough funding to allocate sufficient resources to decent evaluation processes. Everyone wants us to demonstrate long term impact and that needs a properly resourced longitudinal strategy across the sector rather than everyone trying to do it individually.</li> <li>• We also need more longitudinal studies in the sector on a variety of audiences.</li> <li>• It is recognised that some important outcomes can take years to develop. Usually there is no funding to track this.</li> <li>• Some funders are already trying longitudinal studies. Unfortunately it is hard to determine the impact of a particular intervention, or set of interventions, in a world where STEM can be consumed in many different ways.</li> </ul>
Meta evaluation / programme level research	8	<ul style="list-style-type: none"> <li>• It would be better to fund it centrally and manage it for all projects than to expect all engagers to be evaluation experts, or even to be able to bring in decent evaluators.</li> <li>• We need to work more with social sciences to evaluate PE. Too often quantitative scientists think that a survey will tell them everything they need to know, but evaluation should be more nuanced.</li> <li>• A big rethink is needed about evaluation so that it is seen as 'enquiry for change', and not just put in boxes such as capturing feedback, reporting, monitoring and promoting.</li> <li>• A study to explore impact of investment beyond the level of case study or individual project/audience group would be the responsible thing to do - longitudinal / long term is an added bonus.</li> </ul>
Ensure appropriate to project / resources	7	<ul style="list-style-type: none"> <li>• It needs to be in line with the scope of the funding and the size of the project being funded. Ideally it would also be nice to have some consistency of approach across similar types of funders/purposes.</li> <li>• Important that evaluation plans are fit for purpose and the right size to the project!</li> <li>• Finally there needs to be clearer guidance on appropriate levels of evaluation. While all evaluation needs to be high quality, not all evaluation needs to comply to stringent research standards where the evaluation is for self-development.</li> </ul>

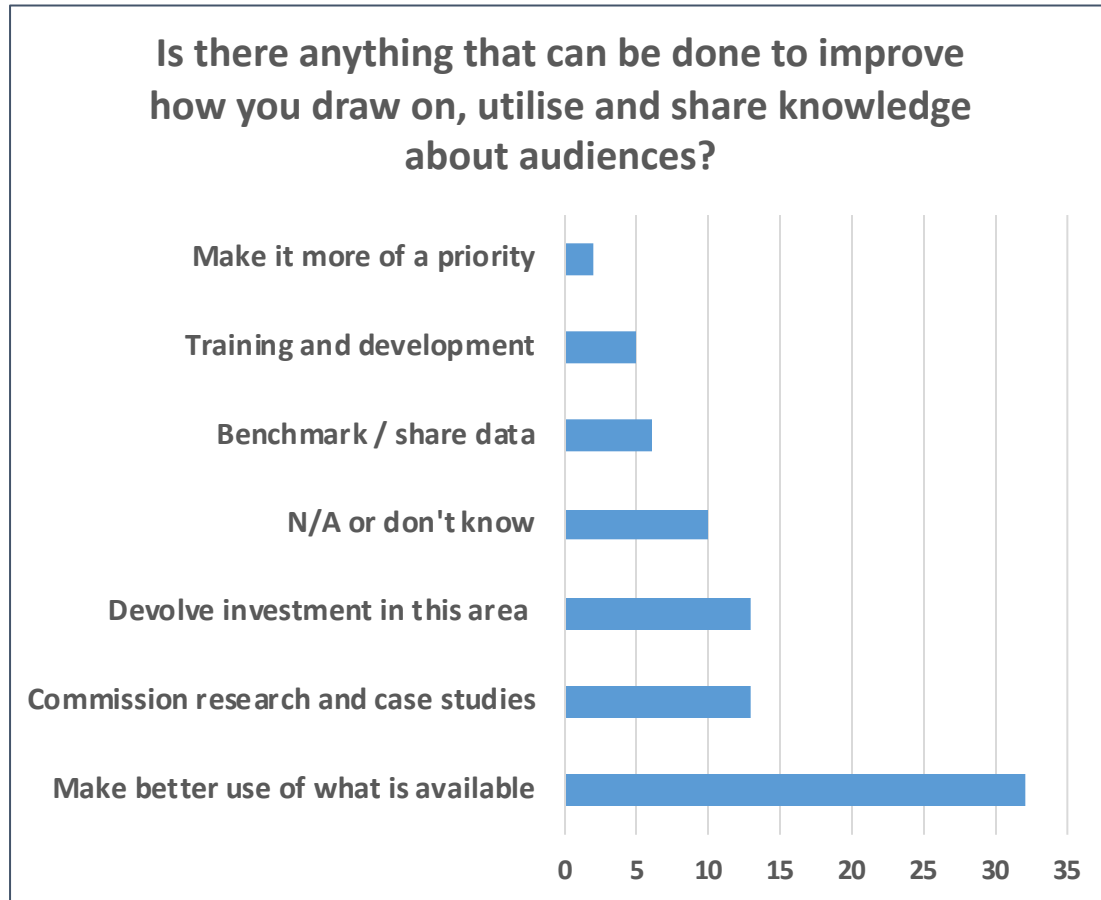
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## Do you have any other comments about evaluation? (cont'd)

Topic	No.	Typical comment
Greater consistency, standard tools and benchmarking	7	<ul style="list-style-type: none"> <li>• Easy to use, fast and cost-effective evaluation tools to embed into activities are needed to provide meaningful evaluation.</li> <li>• I think it needs to be a standard and standardised practice.</li> <li>• Model questionnaires from funders would help</li> <li>• I think there should be a STEM engagement tool that all organisations can use so we can bench mark data, compare trends and run more rigorous evaluation across the sector. I also think there should be a free, accessible data base that includes this data and a way which we can use pupil numbers to track long term impact.</li> </ul>
Invest more in evaluation	5	<ul style="list-style-type: none"> <li>• Evaluation is both feared, and under-resourced. It should be more of a partnership, and resourced adequately.</li> <li>• PE teams rarely have sufficient staff to dedicate someone to evaluation, which would be the best approach. If funding opps could allow researchers to take on RAs specifically to help with evaluation, this would be very useful.</li> </ul>
Share failures	5	<ul style="list-style-type: none"> <li>• Doing evaluation is one thing. Sharing it is another. Despite the fact that the PE community is very supportive and friendly, there's still quite a lot of competition and general hesitance to share what's been done. Funders could potentially be role models here and share really frank assessments of what they've done and funded, that admits things that could have been better but really celebrates what's been learnt.</li> <li>• Evaluation data needs to be shared widely within the profession. If evaluation is only shared by the evaluator and the project they are evaluating it is of limited use, because it prevents wider sharing of learning points that emerge from the evaluation.</li> </ul>
Share failures (cont'd)	5	<ul style="list-style-type: none"> <li>• Evaluation is only as good as the evaluation - lots is done to just celebrate or 'prove' success whereas there needs to be a more fallible open culture - especially amongst academia. People should be encouraged to be proud to dissect and share their failures in order to further practice.</li> </ul>

Topic	No.	Typical comment
Change what we measure	4	<ul style="list-style-type: none"> <li>• Self-reflection and evaluation about what went well and what could be improved is sometimes more appropriate in such situations.</li> <li>• Critical evaluation and "impact" must not be the sole point of measured success.</li> <li>• The experiences and on-the-spot analysis of those performing the engagement should count for more than it does.</li> </ul>
Improve training and CPD	4	<ul style="list-style-type: none"> <li>• I have struggled to find CPD in this area.</li> <li>• Most people do not know how to evaluate thinking it is complicated, it need not be.</li> <li>• Evaluation Training is good, but shouldn't be too prescriptive - BBC Children In Need's model which allowed a lot of practitioner insight and flexibility was I thought a great model.</li> </ul>
Share evaluations	3	<ul style="list-style-type: none"> <li>• Evaluation data needs to be shared widely within the profession. If evaluation is only shared by the evaluator and the project they are evaluating it is of limited use, because it prevents wider sharing of learning points that emerge from the evaluation.</li> <li>• Funders have a responsibility to lead on evaluation by allocating suitable funding for it and by sharing best practice. There could be more co-ordination and shared methods so that different evaluations can be compared more easily. Funders can take a greater lead on sharing outcomes of evaluations - BSA's collective memory was underused and so ineffective.</li> <li>• Publish as open data</li> </ul>
Raise the quality	2	<ul style="list-style-type: none"> <li>• The levels of knowledge and competence across the sector varies hugely. This needs to be quantified and raised.</li> <li>• My experience as an attendee of public engagement events is that it is often obviously an afterthought and poorly done, and rarely collects useful information!</li> </ul>

## Is there anything that can be done to improve how you draw on, utilise and share knowledge about audiences? (open response)



Topic	No.	Typical comment
Make better use of what is available	32	<ul style="list-style-type: none"> <li>• There are some enormous datasets about STEM engagement with schools. STEMNet, Tomorrow's Engineers, Medical School Outreach. There should be much more learning published that would assist others be more effective with their audience targeting.</li> <li>• An easily searched database of project reports that might highlight such insights would be helpful.</li> <li>• Having a forum to publish this information</li> <li>• Central database similar to what the UK science festival network have to collate data.</li> <li>• It can be frustrating when academic research is only published in expensive books or journals. We're independent researchers not affiliated with any HEI. The main thing that would help us is for more recognition that we need access to the data, that we aren't using it for profit but for good.</li> </ul>
Commission research and case studies	13	<ul style="list-style-type: none"> <li>• Mainly, I think we just need to fund social science departments to do more of it - too much of it is just done in piecemeal, underfunded ways project-by-project.</li> <li>• I will say that, based on my academia days, I worry that people are placing too much emphasis on direct feedback from audiences, particularly via surveys etc. It's obviously impossible to make changes based on feedback you've not received, I just think a more tentative, restrained analysis of available data would be wise.</li> <li>• Sharing of brief case studies with networks may be useful. A basic how to guide for those starting out.</li> <li>• Research about what people value and how they really behave (and why) is probably more useful than general audience attitudes research.</li> </ul>

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## Is there anything that can be done to improve how you draw on, utilise and share knowledge about audiences? (cont'd)

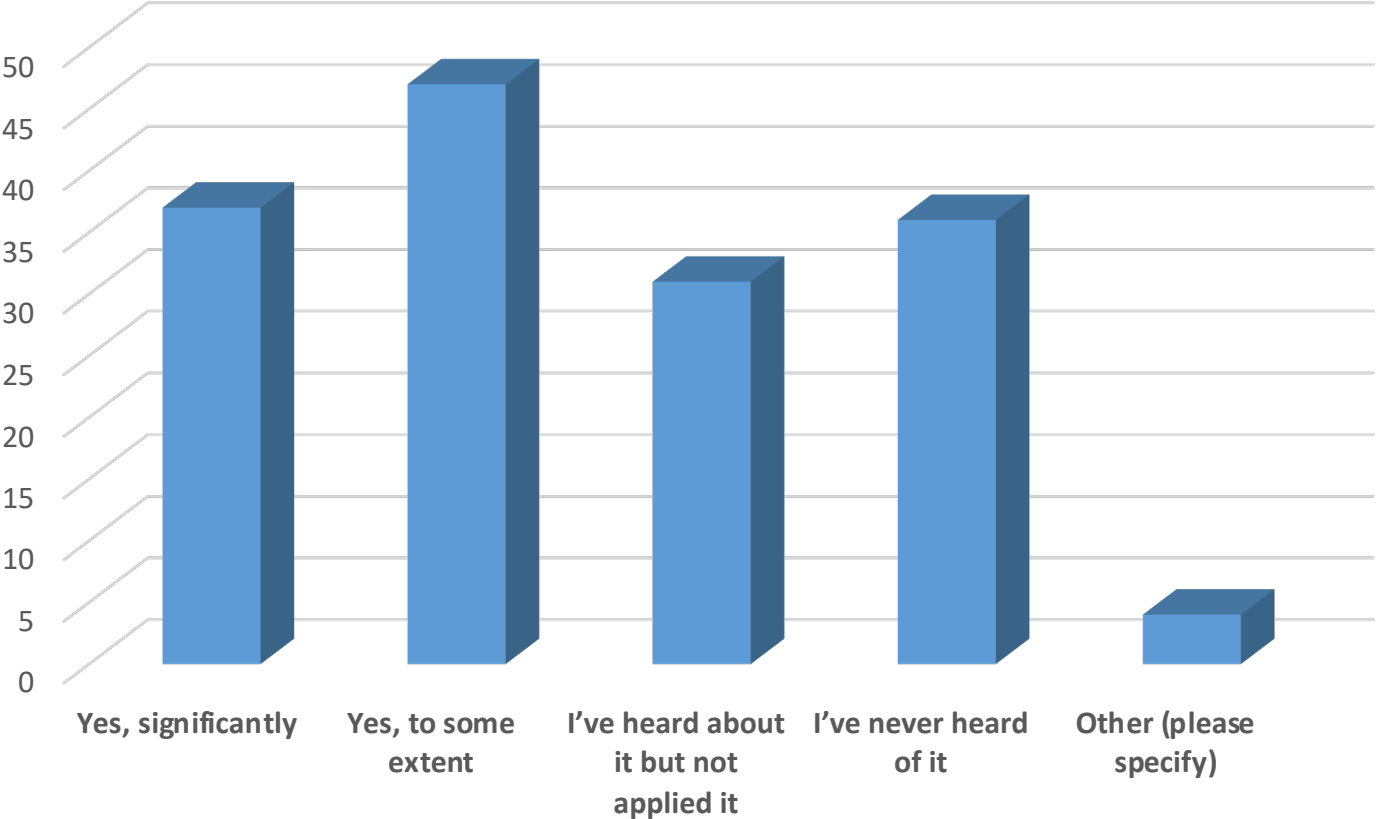
Topic	No.	Typical comment
Provide more funding to organisations	13	<ul style="list-style-type: none"> <li>We require bespoke information for our audience insights, so invest in this area</li> <li>Increase staff capacity for evaluation and collaboration with researchers</li> <li>A series of concise reports and case studies on particular audiences might be a good start, but e.g., BAME teenagers in London are not the same as BAME teenagers in Bristol, so there needs to be mechanisms and funding to allow conversations and partnerships, and experimentation/piloting, to help identify and respond to specific needs and differences.</li> <li>An acknowledgement, in whatever form it takes, that to do this requires resources (in a system where resources are limited and where there are many competing priorities).</li> <li>Continue to develop the effectiveness of how we use our CRM system to collect or report on visitor data.</li> <li>More consultation and co-creation. Although we already do this, more money and time would allow for more creative and informed programming.</li> </ul>
N/a or don't know	10	<ul style="list-style-type: none"> <li>I'm sure there is, but I don't know what.</li> <li>For my shows, not really</li> </ul>
Benchmarks / Share data	6	<ul style="list-style-type: none"> <li>Yes! We are attempting to share data within our partnership of museums, but there is a lack of data consistency at times. It would be very useful to have shared tools across the sector for benchmarking and knowledge sharing.</li> <li>Standard way of assessing audiences relationship with science - and a way of comparing that with proportion in national and local audiences</li> <li>Greater understanding the ecology of STEM engagement within each region and nationally.</li> </ul>

Topic	No.	Typical comment
Training and development	5	<ul style="list-style-type: none"> <li>Get people who are doing the engagement to reflect on their own knowledge or preconceptions about audiences, and scrutinise their motivations and desires outcomes</li> <li>Improving researchers' awareness of this being a legitimate step in planning.</li> <li>Training on how to evaluate your impact</li> </ul>
Make it more of a priority	2	<ul style="list-style-type: none"> <li>I suppose an increase in reporting and evaluation would help everyone to learn from past projects and findings.</li> <li>Clearer priorities over the type of audience we should be engaging with</li> </ul>

# Approaches to and uses of Science Capital in their work

Given the Forum's decision to adopt Science Capital as a framework to underpin our collective work, we were keen to explore how people in the sector are using it in their work. Over half of the respondents said that it was informing their work, and was particularly useful for their activity with underserved audiences

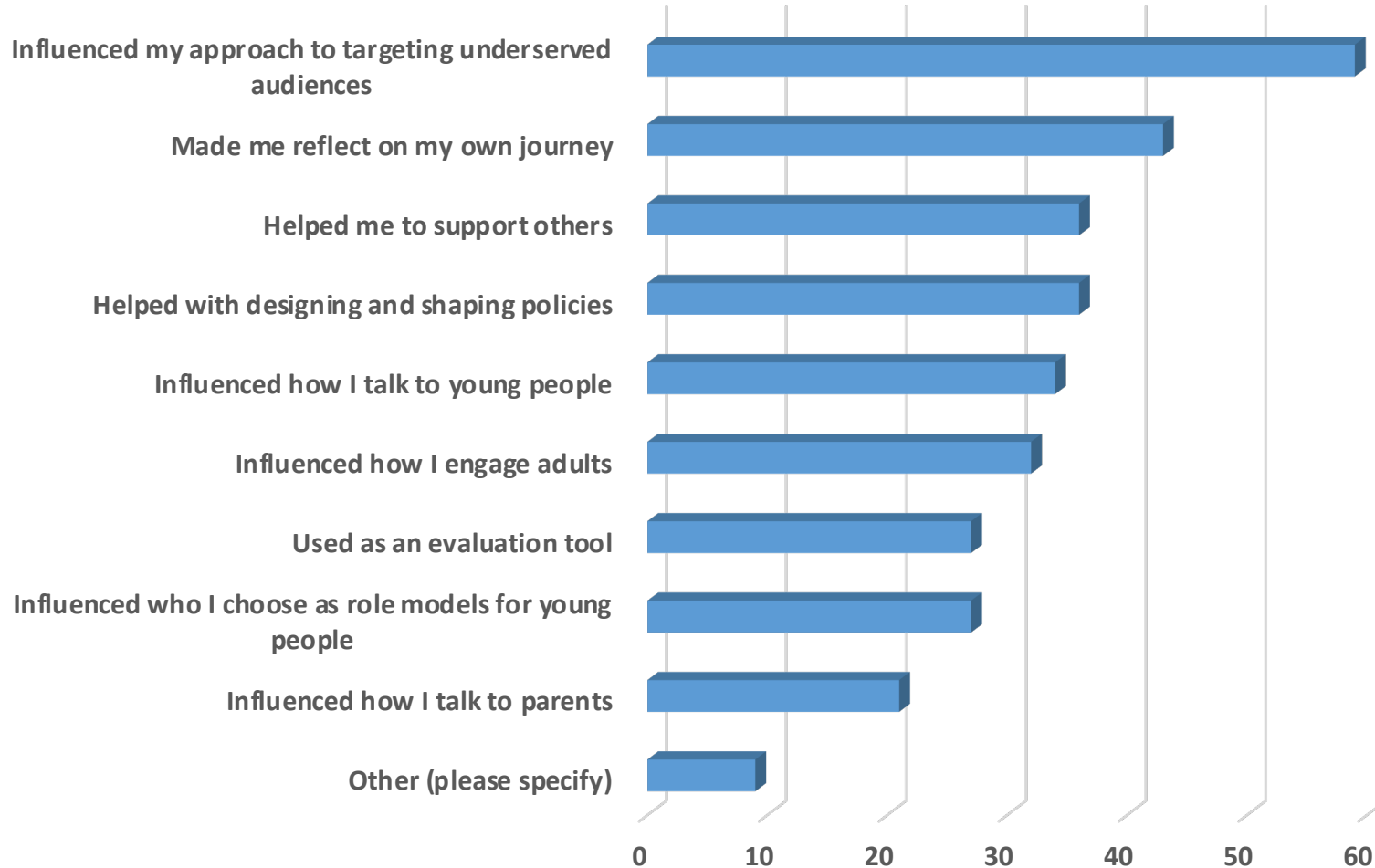
# Has the concept Science Capital informed your work? (only one response allowed)



**Other**

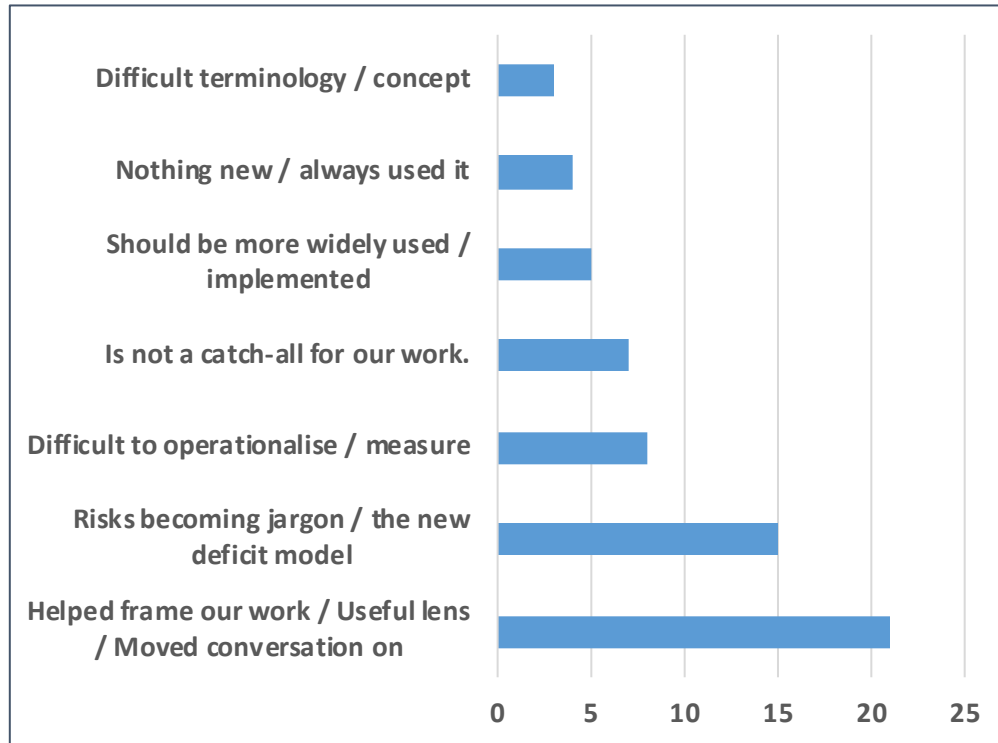
- I've heard of it but don't really understand what it means.
- I've heard of it but think it is a useless concept at the minute given the project has yet to report ANY practical ways to use it
- it doesn't really inform the work I do now, but I know it well having applied ideas of capital to sci education for over a decade
- It just seems to be another label for something that didn't need one.

## If answered yes, how have you used it? (select all that apply)



- Other**
- Influenced how we use exhibitions (i.e. to what end/purpose) as we move beyond only presenting factual information
  - critique of science capital
  - in surveying the local landscape
  - It's validated our approach. Further work on what it looks like in practice will help.
  - Influenced our approach to research and evaluation plus the design and delivery of our interventions and the target audiences.
  - Influenced resources we provide to take home after an activity/event
  - See above - am aware but think it's impractical and rehashed old ideas
  - Helped clarify my thinking, that you move people a bit along the road, not all the way. And that's OK.
  - Influenced how I talk to all of our organisation's key audiences

## Do you have any other comments on Science Capital and how you have used/not used it within your work? (open response)



Topic	No.	Typical comment
Helped frame our work / Useful lens / Moved conversation on	21	<ul style="list-style-type: none"> <li>• Changed our emphasis towards multiple interactions and meaningful relationship/mentor building. It is hugely fashionable and provides great insight in describing audiences, but changing science capital is contentious.</li> <li>• I use it within a framework of thinking about inequality and opportunities more generally, framed around justice.</li> <li>• Very useful lens - especially as it has a robust evidence base, which means that the researchers I work with are more likely to believe me when I talk about it!</li> <li>• Science Capital has completely shaped the way that I engage with the public and as an organisation we are all using this to ensure we are accessible to all and our offer is developed to be accessible at different levels depending on a individuals Science Capital.</li> <li>• Very useful lens - especially as it has a robust evidence base, which means that the researchers I work with are more likely to believe me when I talk about it!</li> </ul>
Risks becoming jargon / the new deficit model	15	<ul style="list-style-type: none"> <li>• As it cannot be measured, and is fairly nebulous, is there a danger of it becoming a buzz word for managers / grant applications without actually changing the way anyone does anything? That's how I've most come across it in practice.</li> <li>• It is becoming a lazy shorthand to talk about people who live in areas of multiple deprivation aka 'The Poor' without considering their circumstances in any depth.</li> <li>• Across this community I see large organisations adopting this idea then reducing it to a meaningless description of work they already do (equivalent to 'science education' or 'science literacy').</li> <li>• The backpack analogy can be misconstrued by those who are still dominated by the deficit model. They can see people with low science capital as empty vessels to 'fill up'. Instead we should be thinking about how we develop our understanding of what is in diverse backpacks and how we might use what people have to cultivate engagement</li> </ul>

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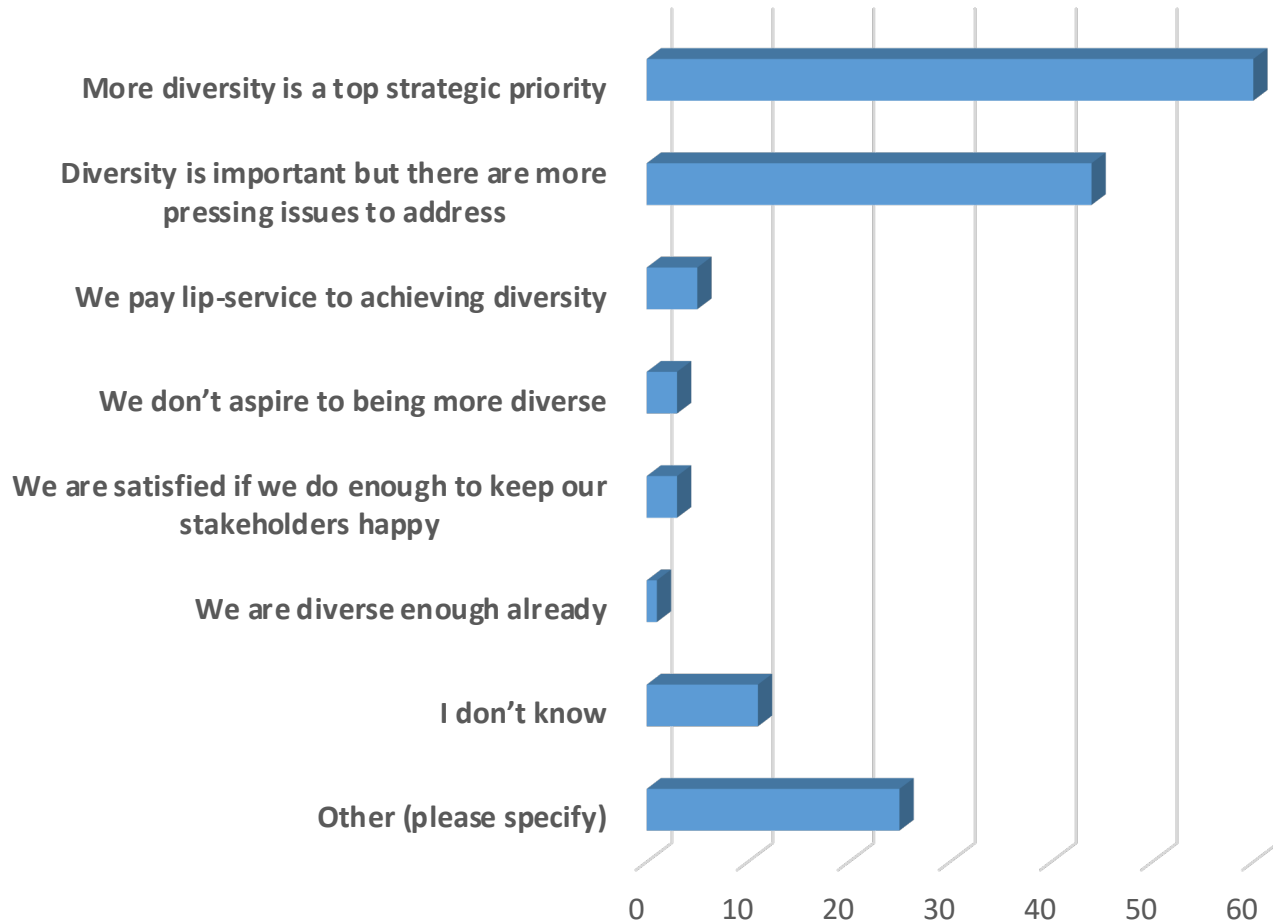
## Do you have any other comments on Science Capital and how you have used/not used it within your work? (cont'd)

Topic	No.	Typical comment
Difficult to operationalise / measure	8	<ul style="list-style-type: none"> <li>• It is extremely difficult to operationalise for shorter term interactions, and we don't really know what 'increasing science capital' actually means or looks like.</li> <li>• Having heard about Science Capital a lot, I don't really see how I can 'use' it. It kind of just 'is'. Let the social scientists come back in 10 years' time and see whether the current focus changes it.</li> <li>• I feel like the techniques created are very much school focused, and not as easily applicable to informal settings.</li> </ul>
Is not a catch-all for our work.	7	<ul style="list-style-type: none"> <li>• Focus on aspiring to STEM careers is not everything that we hold as central to our organisation aims.</li> <li>• Recent research situates science capital within a range of factors affecting student aspirations. However, current attention paid to it almost (but not quite) suggests it is the only important factor.</li> <li>• The work on science capital has been helpful, but it is tending to squeeze out other important new thinking which is a concern.</li> <li>• I see the need to acknowledge that science capital is something that deserves attention, alongside more embedded terms such as cultural capital, but is there a risk of there being so many types of 'capital' that the term loses meaning?</li> </ul>
Should be more widely used / implemented	5	<ul style="list-style-type: none"> <li>• I note is that it hasn't seemed to have informed my colleagues on the admissions/widening participation side, they of course are still targeting older school students, and trying to make science 'fun'</li> <li>• Glad to hear that it is now being researched in Informal Science Learning and community settings. It will be interesting to learn how the concept of Science Capital can inform the design and contribute to the outcomes of programmes with other aims and objectives - such as community cohesion or youth work outcomes for example.</li> <li>• We keen to use it to shape all future engagement projects - would like to understand more about how to use it as an evaluation tool.</li> </ul>
Nothing new / always used it	4	<ul style="list-style-type: none"> <li>• An idea to get people to increase people's exposure to science. That's exactly what my job does</li> <li>• It seems to be another route to the same sort of practice that would be suggested by cognitive science.</li> </ul>
Difficult terminology / concept	3	<ul style="list-style-type: none"> <li>• More terminology unknown in industry</li> <li>• It is still a difficult concept for many researchers to grasp, however once they have it, it is a great driver for creativity in engagement design.</li> <li>• There must be a more immediately meaningful phrase to replace this!</li> </ul>
Other comments	2	<ul style="list-style-type: none"> <li>• Would like to learn more about it.</li> </ul>

# Approaches to diversity

The survey explored how organisations are approaching diversity. For more than half, a major strategic priority is addressing the diversity of audiences (80/158); for a smaller number, the diversity of their own staff is a top priority (60/158). Inadequate funding was identified as a critical factor holding back progress

**In relation to its WORKFORCE, which of the following do you think best describes your organisation's attitude to increasing diversity?  
(only one response allowed)**

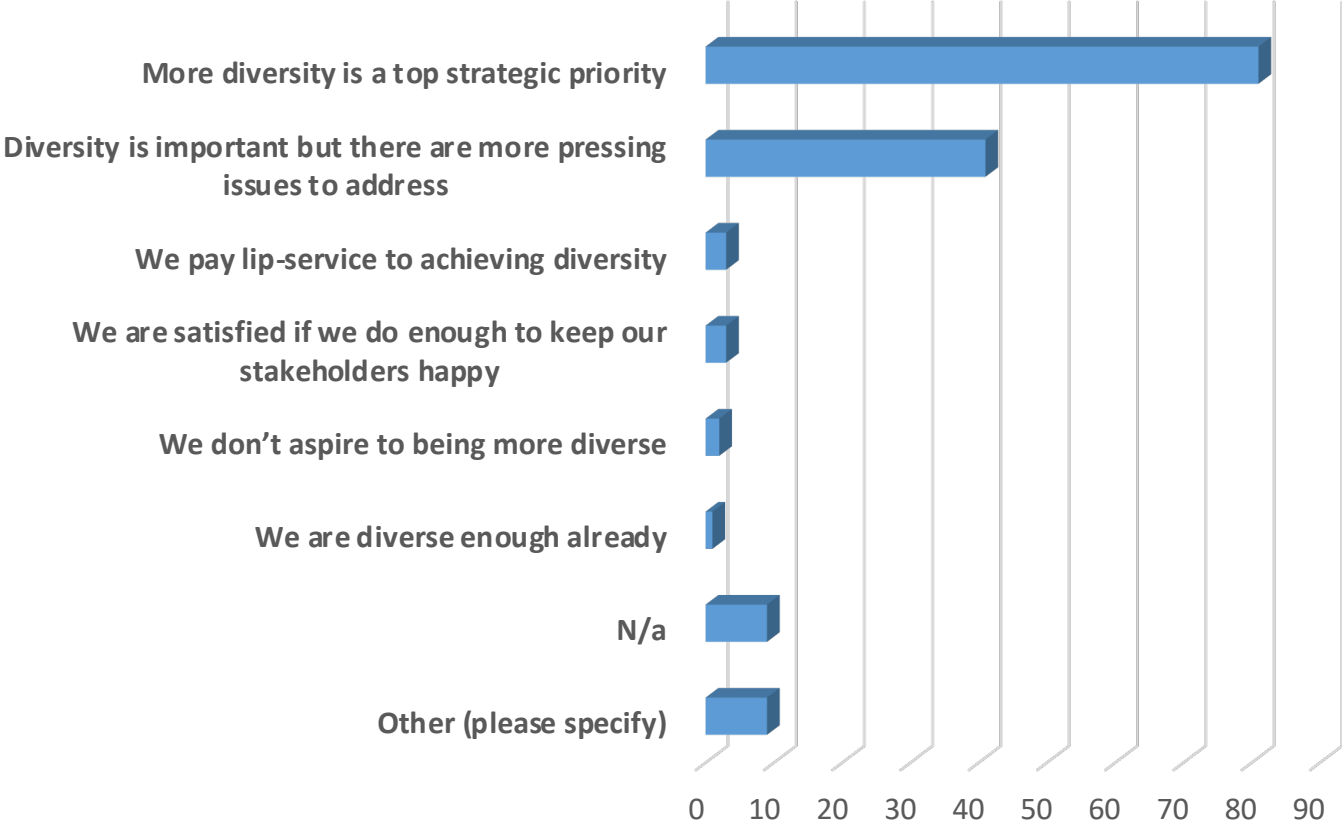


**Other**

- As a one man band I cannot be more diverse!
- As a very small organisation, it's complex to answer with any of the points above. Diversity matters to us in many ways.
- Diversity is quite important but different parts of the organisation are more positive about it
- Diversity is tricky in a workforce of one but I encourage those I work with to consider it
- Diversity is valued but not above expertise and capability
- don't separate out 'diversity' from 'inclusion', please
- I am a sole trader.
- I am a solo freelancer, this is not applicable.
- I am freelance
- I am half of the organisation and we have no plans to expand for the foreseeable future
- I can't really answer this. I am the sole worker in my organisation and I have no plans or desire to employ others
- I work alone
- It's only me!
- More diversity is a top priority
- Our organisation is already very diverse, but that doesn't mean that its not important to us. Something to keep working towards.
- Parts of organisation are really committed to increasing diversity. But not all: financial pressures prioritise rich audiences.
- Small workforce makes diversity statistics tricky. Focus is on inclusivity more than diversity.
- The org doesn't have a workforce per se but works through the contributions of volunteers from a no. of different organisations
- There is only me
- There is only me.
- There is only one person in my workforce.
- We are a small organisation and diversity of people and skills is very important and a key recruitment consideration.
- We are just two volunteers - how can we incorporate diversity?
- We focus on diversity & inclusion in what we do. But our small, low turnover staff is not diverse.
- You can't diversify one person



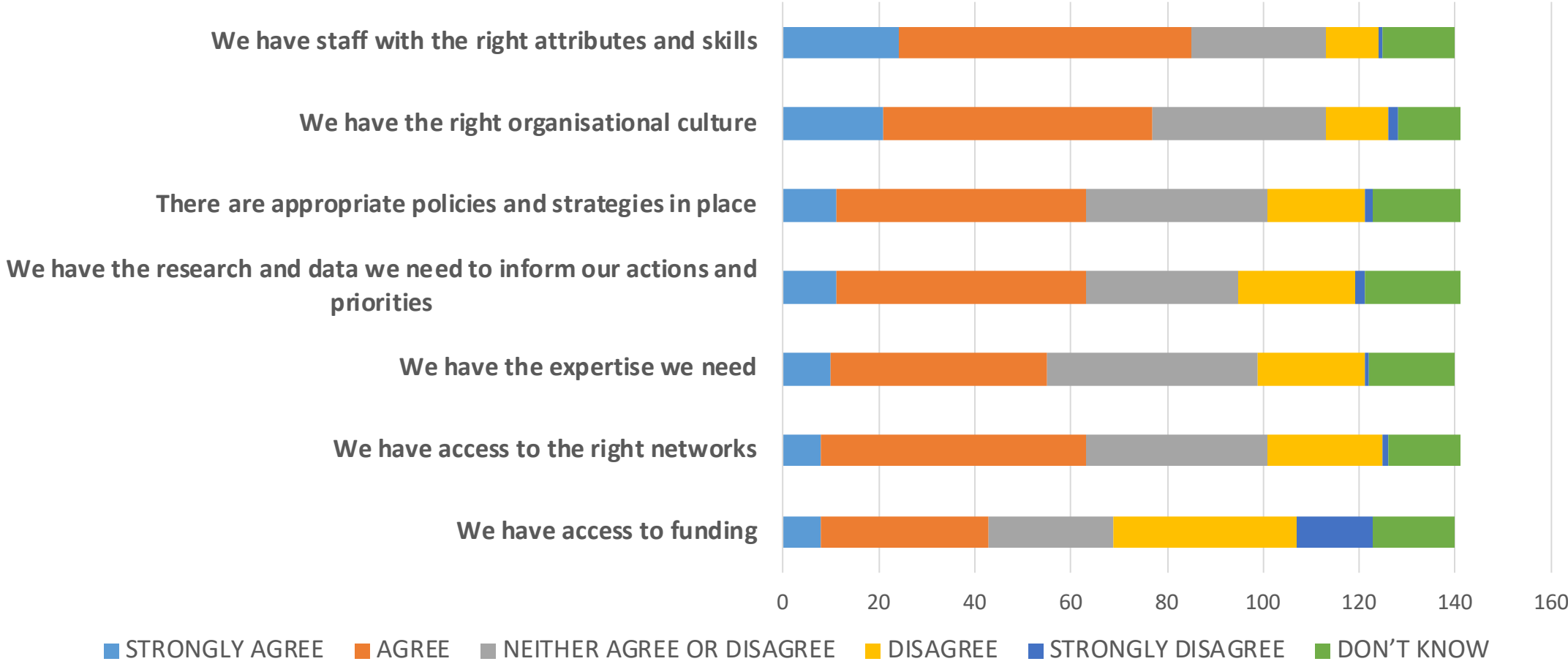
**In relation to its AUDIENCES AND PARTICIPANTS,  
which of the following do you think best describes  
your organisation’s attitude to increasing diversity?  
(only one response allowed)**



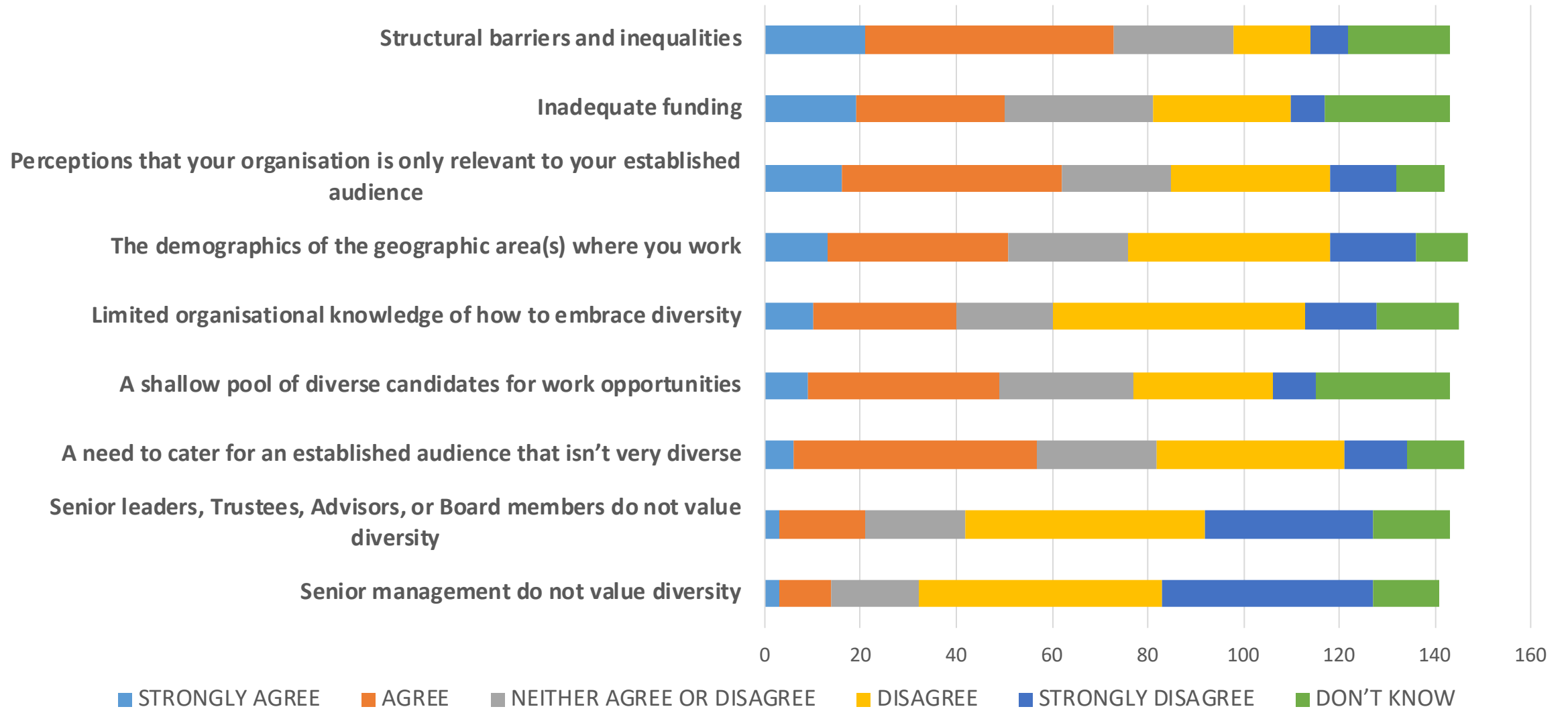
**Other**

- As a faculty it is very important (it is at our core) but as a University there is an aspect of lip-service to that.
- Diversity is important....
- Diversity is quite important.
- For my research group: diversity is a top priority. For the university as a whole I can't comment.
- For school-aged audiences there is lots of focused effort and this is a top priority. For other groups, there is less attention.
- More diversity is a top priority
- Organisation partly genuinely wants to reach out; however courses for rich students too often prioritised.
- see above - diversity and inclusion are top priorities but not separately
- We aim to reach all facets of the community in which we work.

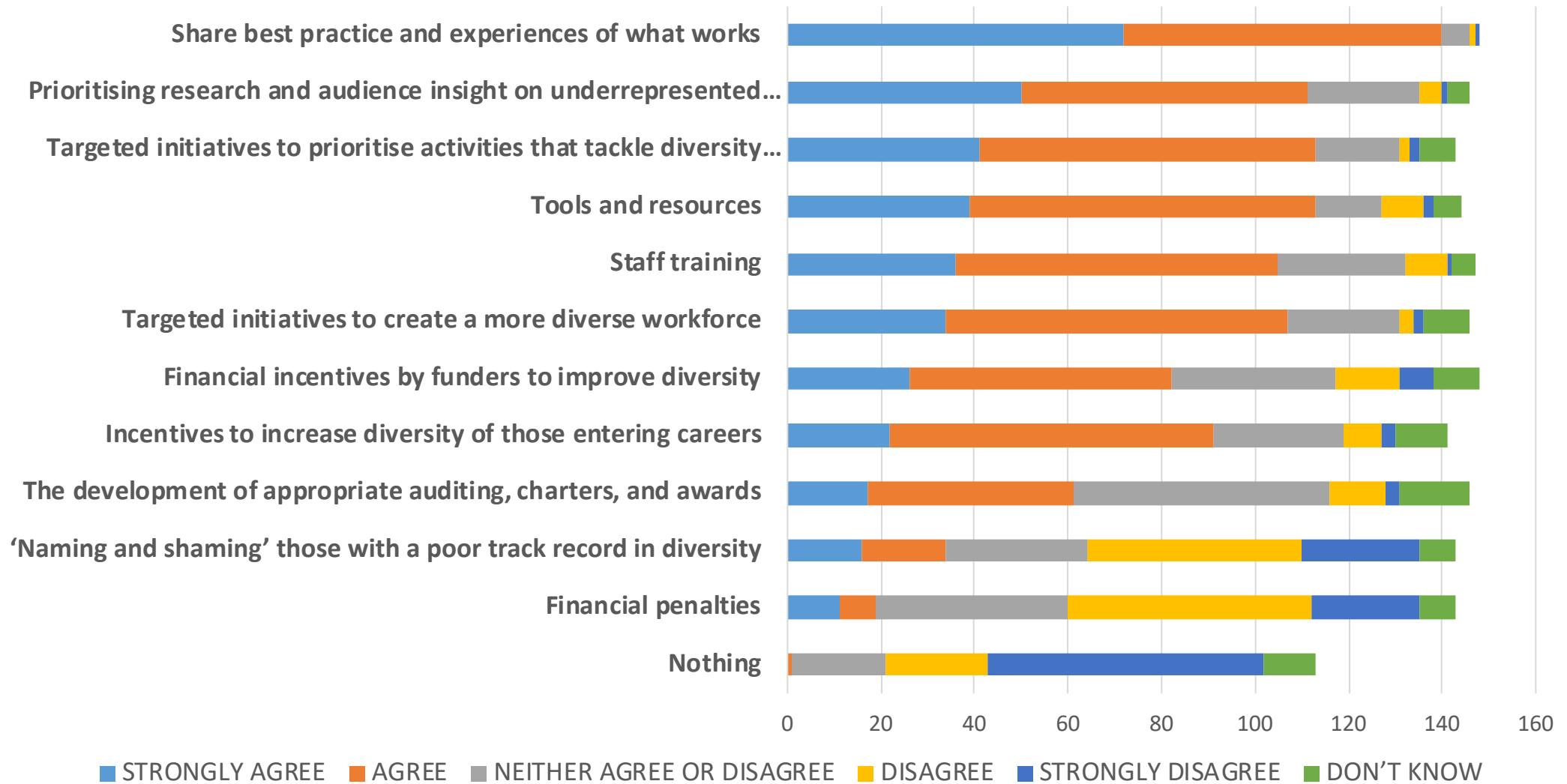
# To what extent do you agree/disagree with the following statements about how well equipped your organisation is to improve diversity and inclusion in STEM?



# In your opinion, which factors hinder your organisation's efforts to be more diverse and inclusive?



# In your opinion, what should be done to improve diversity in STEM?



## Do you have any other general comments about diversity in STEM? (open response)

Topic	No.	Typical comment
Need to change our culture – developing a broader more sophisticated understanding, terminology, language and practices.	9	<ul style="list-style-type: none"> <li>We need to broaden frames of what STEM is, to include more indigenous and ecological perspectives.</li> <li>Often quite narrow approaches are taken, and certain groups are targeted for inclusion while other are ignored. e.g. much greater focus on increasing number of women and on being parent-friendly, patchy focus on socioeconomic background, very little on ethnicity, disability. Well-meaning people think as a woman I am a nice tick in their diversity box - I am white, middle class, child free and able bodied, so really life has presented very few limits.</li> <li>As with previous sentiments, I feel the STEM community can appear quite insular and closed off for those who aren't of the 'right' background or don't do things the 'correct' way. I'm from a strongly working-class background and have often felt judged and found lacking for these traits. I imagine those from even more different backgrounds likely feel it a lot worse. Initiatives and agendas are fine, but actions count more than words and accepting that people have different approaches and views to the mainstream sci-comm are vital to improve diversity.</li> </ul>
It's a systemic / societal issue.	8	<ul style="list-style-type: none"> <li>Any discussion of the diversity problem in STEM must take account of wider societal issues around diversity and inequality. Britain is becoming an increasingly unequal society and this regrettable trend must be having an impact on the diversity of people aspiring to careers in STEM. Therefore we should recognise that these wider problems may work against efforts within the sector to increase inclusion and diversity. We should also not shy away from pointing out that these wider problems have an impact on our efforts to increase diversity in STEM, and we should join forces with others committed to addressing these wider problems.</li> <li>It is an issue all the way up the pathway from school and early education as to who is encouraged to do STEM, which should be changed at a systematic level.</li> <li>There are cultural problems in trying to widen diversity, starting in the home and possibly local community.</li> <li>This is a huge problem and needs to be tackled at the point of origin which is the school system and the point at which individuals are starting to learn STEM subjects so that they are interested in pursuing a career in this area, or in careers advice and further decisions around study that will expose pupils to the range of opportunities for careers, but with advice and support to undertake the appropriate educational route to achieve this.</li> </ul>
It's an urgent priority / more needs to be done.	6	<ul style="list-style-type: none"> <li>Insufficient role models, too much pressure on those who exist, a general lack of understanding of the barriers and the impact of improved diversity at senior levels, an internal bias that needs to be broken down from within STEM associated with white male elitism and misogamy.</li> <li>Ultimately the very structures need to change and it's going to take more than 'get a badge on your website' to make that happen.</li> <li>Huge structural problems that we haven't begun to understand - we all stick with the people who are most like us unless we stop and reflect. The data outside of engineering is pretty rubbish (non-existent) so we don't really know what the current situation is. We're only just beginning to understand what is needed to improve diversity.</li> <li>My direct experience is in a primary school where previous events demonstrated a subconscious gender bias.</li> </ul>

## Do you have any other general comments about diversity in STEM? (cont'd)

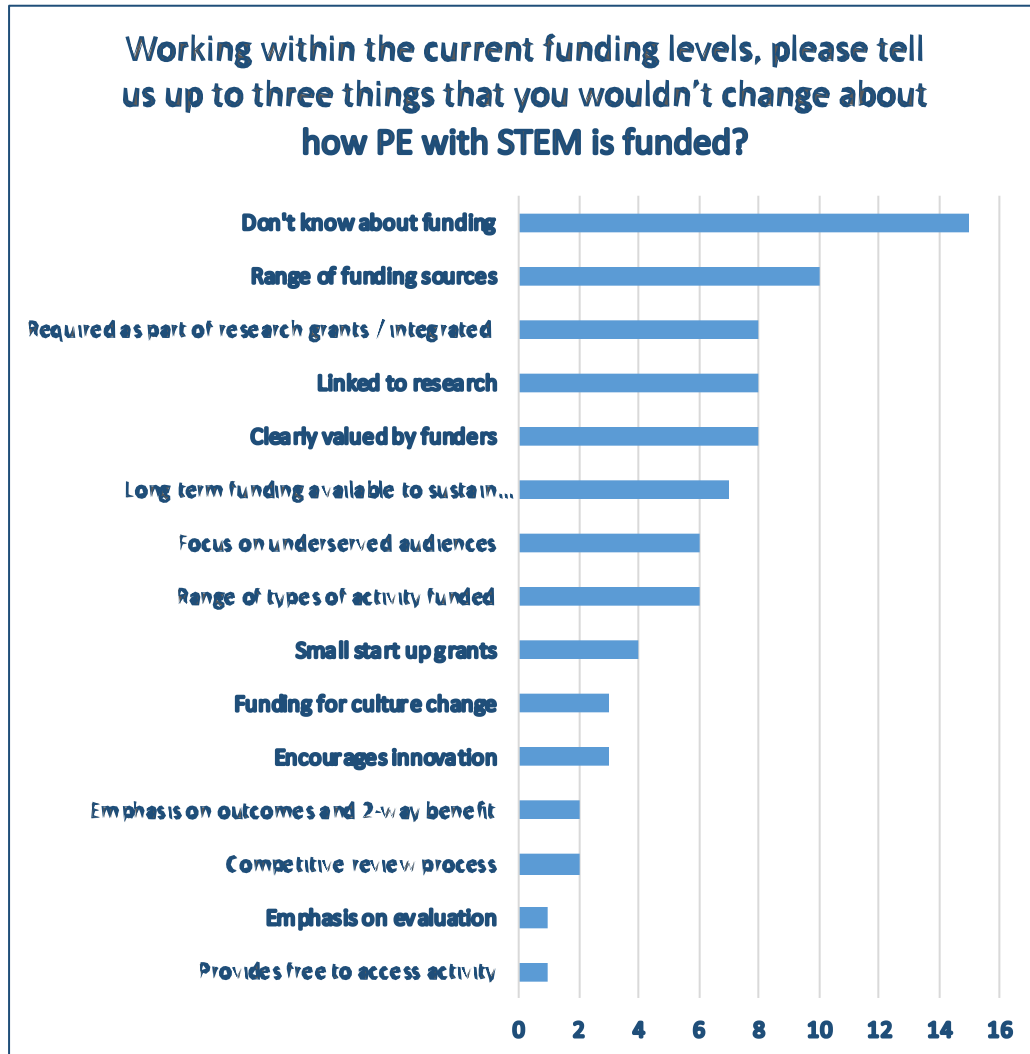
Topic	No.	Typical comment
We've made progress	5	<ul style="list-style-type: none"> <li>• There is already the Athena SWAN charter and Stonewall that work on diversity so I think that there is adequate auditing, charters and awards. Athena SWAN may need some work but I do not think we need something in addition to this as it just adds more work.</li> <li>• We have had great success supporting Nuffield student research bursaries , 4 weeks with a research scientist for yr 12 pupils often from disadvantages backgrounds, providing support and mentoring</li> <li>• We have done a lot of work looking at students' school experience of engineering and have identified that the 'preferred' narrative of engineering (creative, problem solving, human focus, socially beneficial) is being countered by an alternative narrative (it is dirty, workshop based, socially exclusive [at both ends], little social/human value). This seems to have affected girls more than boys.</li> </ul>
Diversity in workforce	5	<ul style="list-style-type: none"> <li>• In my experience it is a lack of diversity in the workforce which means diversity isn't seen as a priority or there is a lack of understanding about diversity.</li> <li>• I think this issue isn't about access to resources, it is about access to diverse role models that currently work in the STEM industry. I think there is some institutional bias that further propagates this which needs to be addressed before we can effectively encourage more diverse young people into STEM careers.</li> <li>• I strongly believe that diversity in your workforce is the way to increase diversity in STEM, and the best way to do this is positive action on hiring of staff.</li> </ul>
Not considered in relation to my public engagement / science communication remit	5	<ul style="list-style-type: none"> <li>• Diversity is one of many competing priorities and engaging hard to reach audiences requires a significant amount of extra time, money, staff, etc that may not be available after reaching existing stakeholders. How can we make broadening engagement pay for itself without negatively impacting the very audiences we want to support?</li> <li>• As a university, where i work cares deeply about diversity - this is a business imperative. However, as a science communication department we are not as diverse and i do not think it is considered a particular priority.</li> <li>• I've been told that as a female in a scientific field of work makes it easier to get the message across about diversity in STEM subjects. I'm very aware of this however this wasn't my main objective when I started carrying out public engagement.</li> <li>• Diversity in STEM engagement sector is also important.</li> <li>• I feel like diversity in STEM and public engagement with STEM research aren't that well-connected so I'm surprised to see them together on this survey. Diversity in STEM is an issue for teaching, research, hiring, estate design, everything that STEM organisations do. Unless most of the funders see "encouraging more diverse children to study science" as a PE outcome, which would show a disappointing unwillingness to actually tackle the huge structural inequalities embedded in STEM.</li> </ul>
More funding / support	3	<ul style="list-style-type: none"> <li>• A lot of my work is with SEN audiences. You need to work in small groups, so you don't reach many people for the investment made. Also not likely to lead to increase in STEM study at uni. Makes it difficult to achieve funding.</li> <li>• More institutional help to, e.g. put you in touch with small BME orgs or similar would be helpful.</li> </ul>
N/A or don't know	3	<ul style="list-style-type: none"> <li>• Diversity in STEM is not a strategic priority for me so this section is hard for me to answer.</li> <li>• I feel I have not been at my Institution long enough and do not have the right experience here to comment extensively on Diversity and Inclusion here.</li> </ul>

# How could PE with STEM be funded more effectively?

Respondents were asked to reflect on the current funding of PE STEM – what they wouldn't change about current arrangements and where they felt improvements could be made. Four broad areas were identified where things could be improved: 'opening up' funding; improving 'the system'; re-thinking priorities for funding; and working in more joined up way with other sectors

# What wouldn't people change about the current funding system? (open response)

The survey invited people to reflect on what they liked about the current system – what wouldn't they change?



Topic	No.	Typical comment
Range of funding sources	10	<ul style="list-style-type: none"> <li>I like that you can approach a range of different organisations and funding is widely available</li> <li>Number of funding sources is greater than other subjects</li> </ul>
Clearly valued by funders	8	<ul style="list-style-type: none"> <li>Current awareness of the importance of PE with STEM is growing, albeit slowly, and major funders are awakening to the challenges. This is welcome</li> </ul>
Linked to research	8	<ul style="list-style-type: none"> <li>There is the opportunity to bring in some funds from research grants, getting researchers to consider public engagement outcomes from an early stage in the project</li> </ul>
Required as part of research grants / integrated	8	<ul style="list-style-type: none"> <li>The increasing appreciation from research councils that outreach, public engagement and understanding should be a universal condition of funding.</li> </ul>
Long term funding available to sustain excellence	7	<ul style="list-style-type: none"> <li>Wellcome Sustaining Excellence fund allows our organisation to develop a long term approach to efficiency, evaluation and alternative funding streams</li> </ul>
Range of types of activity funded	6	<ul style="list-style-type: none"> <li>There is a broad range of projects funded.</li> <li>Range of sizes of grants from small awards for testing and trialling to large scale funding</li> </ul>
Focus on underserved audiences	6	<ul style="list-style-type: none"> <li>Specific funds for working with underserved audiences</li> <li>Increased emphasis on extending and diversifying audiences</li> <li>Good focus on underserved audiences</li> </ul>
Small start-up grants	4	<ul style="list-style-type: none"> <li>Small grants schemes that are fairly light work to apply for and give up to about £1000 are ideal sources of funding for specific PE projects and activities</li> </ul>
Encourages innovation	3	<ul style="list-style-type: none"> <li>PE having set funding sources for new and innovative projects</li> </ul>
Funding for culture change / embedding support	3	<ul style="list-style-type: none"> <li>I would keep Wellcome ISSF funding as it allows long-term appointments of PEP staff that are critical to the success with STEM but also provide vital 'core' funding for embedding PE</li> </ul>
Competitive review process	2	<ul style="list-style-type: none"> <li>Competitive tendering/bidding - requires focus on ideas, quality and delivery by bidders.</li> </ul>
Emphasis on outcomes and 2-way benefit	2	<ul style="list-style-type: none"> <li>Ambitious and progressive agenda that increasingly focuses on impact/outcomes</li> <li>Anti-deficit model, pro-two-way engagement focus is a good one</li> </ul>

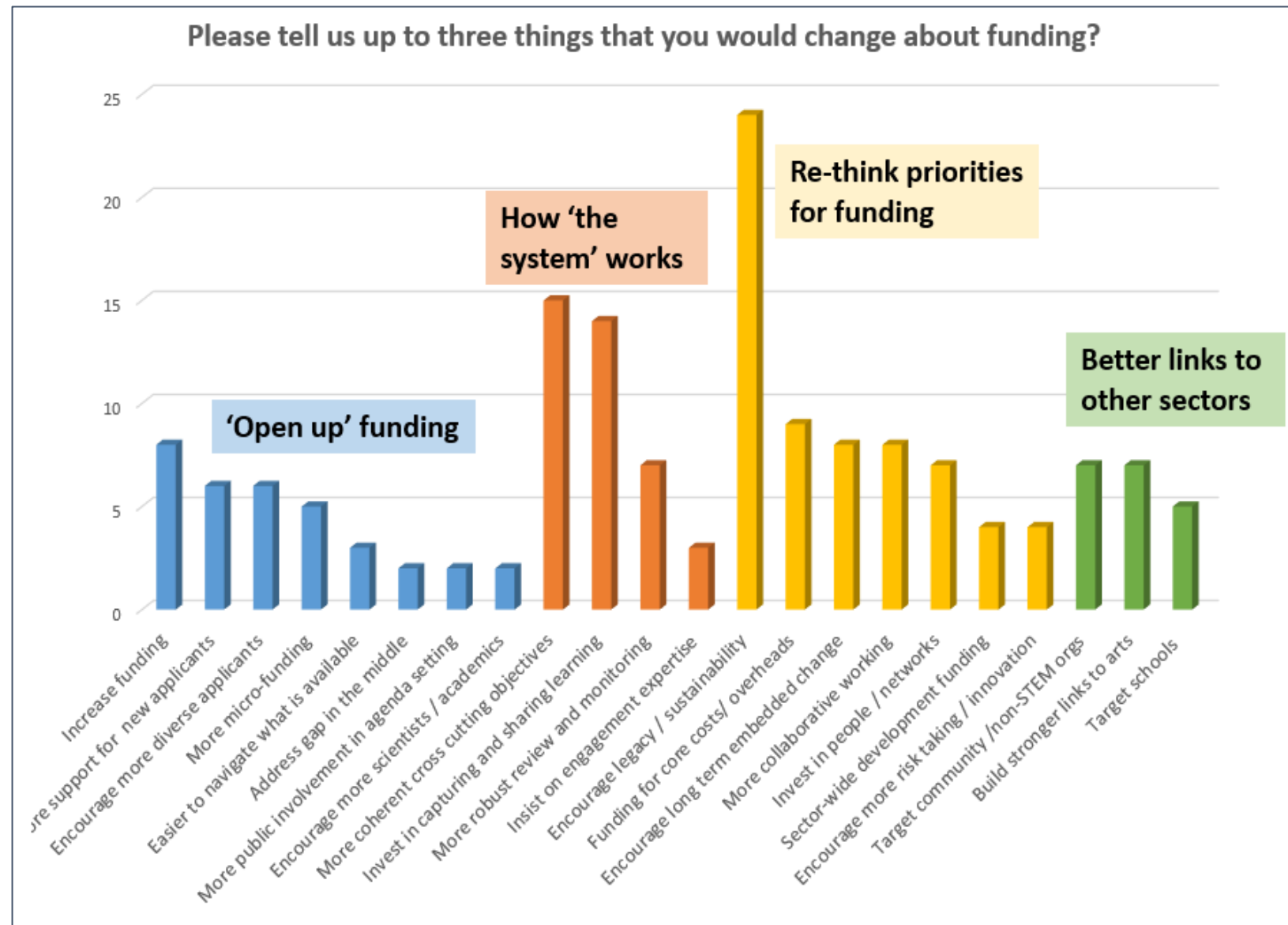


## Please tell us up to three things that you would change about funding? (open responses)

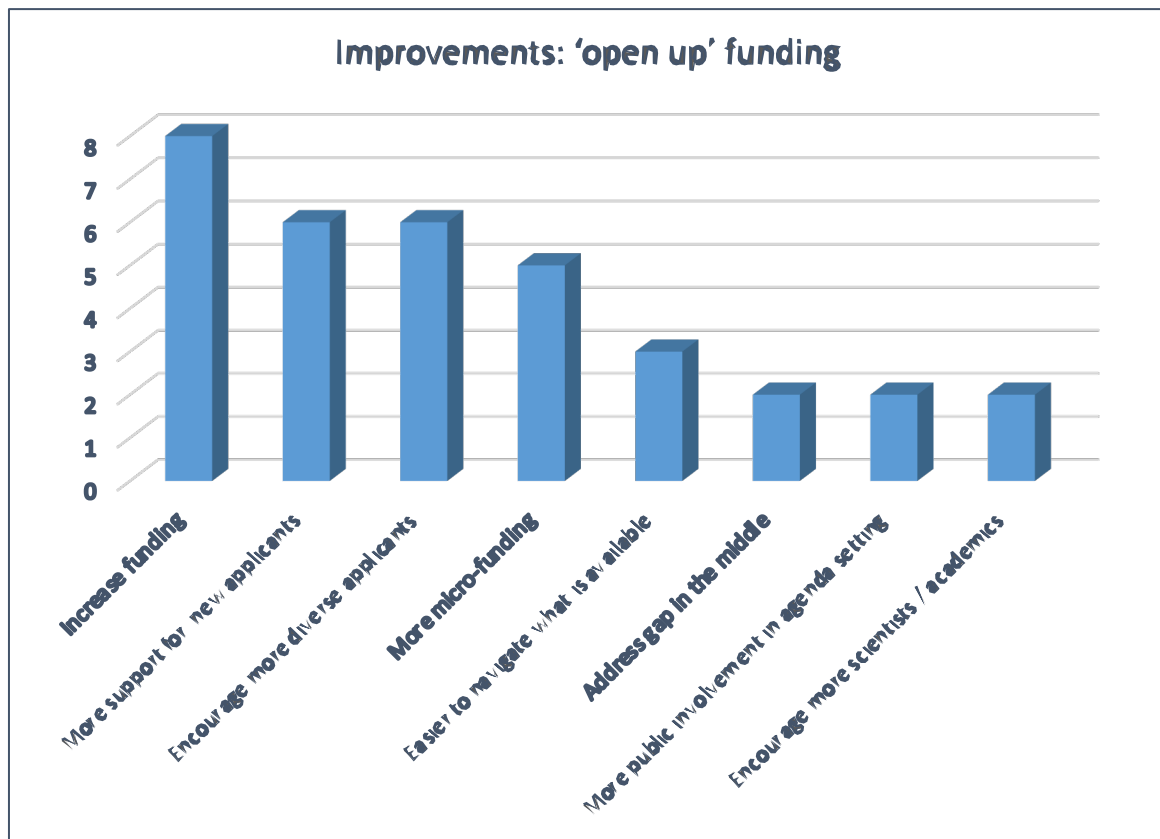
The survey also invited people to identify changes they would like to see in funding arrangements.

The responses broadly clustered into four areas where improvements were suggested:

- **‘Opening up’ funding** - to make it easier to access, by more people
- **Improving ‘the system’** - for instance by strengthening review processes and evaluation and learning
- **Re-thinking priorities for funding** – for instance, focusing on sustaining excellence, rather than ‘new and shiny’
- **Working in more joined up way with other sectors** – and adjusting funding accordingly



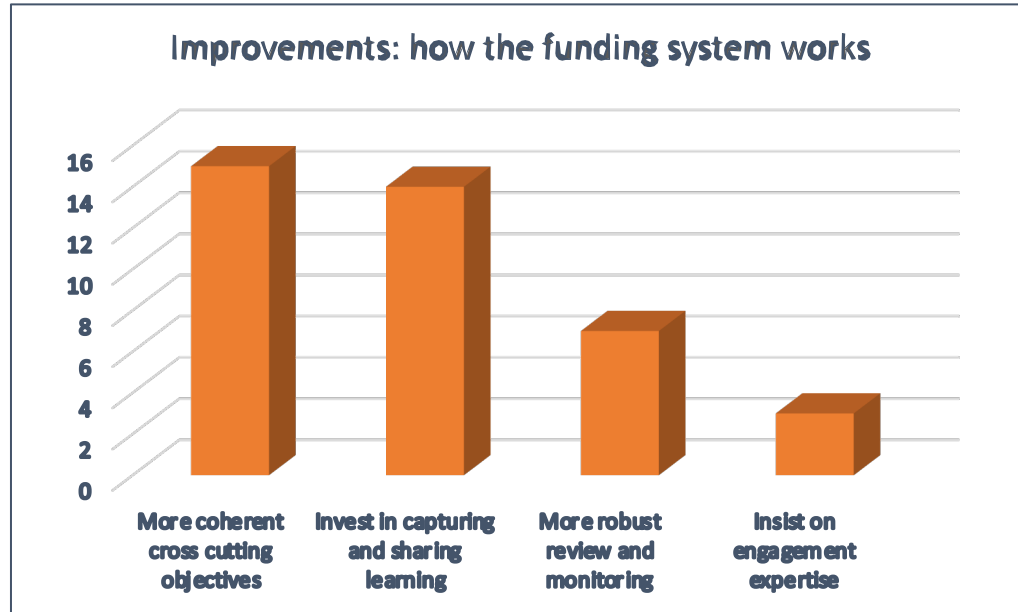
## 'Opening up' funding



Topic	No	Typical comment
Increase funding	8	<ul style="list-style-type: none"> <li>Raise levels of funding massively across the board (even if this means taking money out of research budgets)</li> <li>Tell each research grant recipient that they are expected to spend 5% of their grant/resource on PE!</li> </ul>
More support for new applicants	6	<ul style="list-style-type: none"> <li>Don't just fund the same big organisations over and over: give genuine feedback and support to new applicants</li> <li>I think there should be more guidance available on how to be successful in obtaining funding. I don't think everyone should have to fill in long application forms for small amounts of money</li> <li>Smaller, easier to access pots for grass-roots organisations</li> </ul>
Encourage more diverse applicants	6	<ul style="list-style-type: none"> <li>More opportunities for people/community led engagement (rather than research led)</li> <li>There is a code-of-codes when it comes to writing grant applications that promote success from the usual suspects. I would try to change the way funding applications run to try to reduce the barriers for brilliant groups/individuals who struggle to write in the right way.</li> <li>A more open route for practitioners to access funding for projects</li> </ul>
More micro-funding	5	<ul style="list-style-type: none"> <li>More micro-funding for pilot ideas</li> <li>Need for a different types of funding that reflect a range of timescales over which a project or programme may run, including opportunities for smaller amounts to support short term projects with a fast turnaround, through to longer term funding for large project</li> </ul>
Easier to navigate what is available	3	<ul style="list-style-type: none"> <li>Somewhere that contains all of the relevant opportunities in one place, giving plenty of advanced notice of deadlines etc. as the current situation often results in opportunities for funding being discovered too late.</li> <li>More transparent where funding is available</li> </ul>
Address gap in the middle	2	<ul style="list-style-type: none"> <li>There seems to be a gap between seed funding of up to a couple of thousand and large-scale projects</li> </ul>
More public involvement in agenda setting	2	<ul style="list-style-type: none"> <li>allowing the public to help set the agenda on what they want to hear more about</li> </ul>
Encourage more scientists / academics	2	<ul style="list-style-type: none"> <li>make it more accessible for scientists to engage (more support from employers)</li> </ul>

## Improving how the funding system works

There was significant appetite for a more coherent and joined up approach to the current funding system

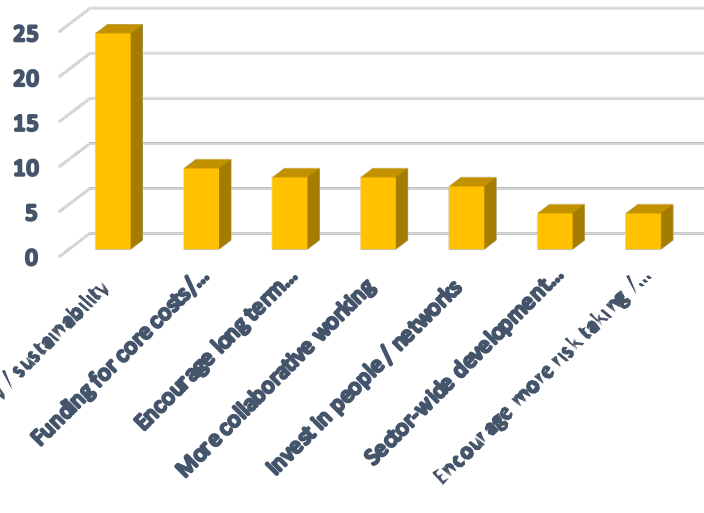


Topic	No.	Typical comment
More coherent cross cutting objectives	15	<ul style="list-style-type: none"> <li>I'd like to see an integrated collaborative approach to learned institutions outreach and PE funding schemes - 100+ individual funds for piddling amounts of money is a pain.</li> <li>The enormous range of funding sources with distinctly different objectives that have a negative impact on strategic focus in smaller organisations and are too time consuming for them to draw upon for capacity building</li> <li>It is too disparate. If you want funding there is nowhere I have found that funds the general promotion of STEM.</li> <li>Consistency in application/evaluation processes across funders and ensuring that these aspects are in line with the amount of funding available.</li> </ul>
Invest in capturing and sharing learning	14	<ul style="list-style-type: none"> <li>Requirement for new projects to designate at least 10% of budget for evaluation, with a 'floor' e.g. £5K below which evaluation budget does not fall. Difficult for small projects (e.g. under £10-15K) so funders should group projects they fund into a joint evaluation. Some cross cutting funding for evaluation (e.g. it would be nice to go beyond individual project evaluation to look at clusters of activities to get a better picture of what works)</li> <li>If you seek innovation, you must be prepared to accept "failure" as a valid outcome sometimes, and it should be honestly reported. Tendency to gloss things into 100% success is not helpful to anybody. Being informed by things that work, and things that don't is vital</li> <li>Less rigid evaluation / reporting - it's not all about the numbers, and sometimes projects can change significantly from pilot to completion, so more flexibility from funders for changing targets would mean projects aren't governed by targets set sometimes years beforehand with no practical experience of the project</li> </ul>
More robust review and monitoring	7	<ul style="list-style-type: none"> <li>More stringent - funding to be accompanied by training course as to how to use it</li> <li>More accountability for funding in research grants; stronger requirements, guidelines for panel, and penalties for poor reporting on funding from researchers - accountability for PER is mostly considered an irrelevance.</li> <li>Detailed feedback from more funding bodies for unsuccessful grant applications</li> <li>Actually monitor whether public engagement is delivered effectively using a central team of evaluators working as objectively as possible. Currently every project "succeeds" on paper whereas in the field we can see that most are a waste of time.</li> </ul>
Insist on engagement expertise	3	<ul style="list-style-type: none"> <li>Open up funding so that it is based on a more informed view of education and learning theory.</li> <li>At present, within the research councils PE funding is driven by the researcher rather than the practitioner. I think this misses a vital link and there is a need for more bottom up funding</li> </ul>

## Re-thinking funding priorities

There was very strong support for funding which allowed good projects to mature and develop, and for funding which allowed long term working to become embedded: 'An emphasis on supporting transformative, organisation-wide change for lasting impact, and tried and tested - rather than short, innovative, wow headline projects'

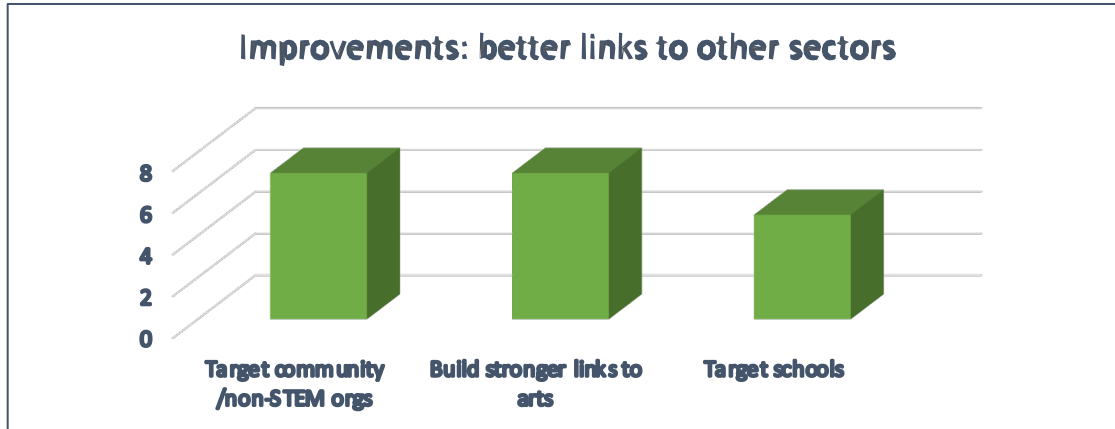
Improvements: re-think priorities



Topic	No.	Typical comment
Encourage legacy / sustainability	24	<ul style="list-style-type: none"> <li>Funding to continue and build on successful existing projects that often cease because of focus on innovation</li> <li>There needs to be a place to go for regular funding so that when grant funding runs out then there is somewhere else to go so this work can continue</li> <li>Projects are rarely revenue generating, so have no means to continue once their funding runs out. Thus although the evaluation of the project may show a short-term success, it cannot be successful in the long-term without the support of a large organisation</li> </ul>
Funding for core costs/ overheads	9	<ul style="list-style-type: none"> <li>Funders allowing for the fact that the most expensive resource for anyone seriously doing this work is staffing costs and overheads. All too readily I am stopped from applying for funding because it is assumed that things like people's time, long term venues etc will all just be gladly given free of charge</li> <li>Some funders don't allow budget for salary. Our salaries are entirely reliant upon grant money - it is not possible for us to deliver a project unless it is fully funded</li> </ul>
Encourage long term embedded change	8	<ul style="list-style-type: none"> <li>It baffles me that people still think that we are going to change the public perception of STEM and what scientists do with projects that last anywhere from a day to 12 months but nothing longer than that. I appreciate that it is expensive to have a project properly funded for 4/5 years but in my opinion that is what is needed to be really influential on a next generation of children</li> <li>Focused, longer term projects + roles + training/development i.e. 5 year funding projects</li> </ul>
More collaborative working	8	<ul style="list-style-type: none"> <li>Greater synergy to reach across the UK and across audiences through improved partnership working while understanding the complexities and resource implications of partnership working</li> <li>More funding that is large enough to support the development of partnerships with non-STEM organisations (difficult to achieve on a £1000 grant, especially if some are required to pay 20%)</li> </ul>
Invest in people / networks	7	<ul style="list-style-type: none"> <li>More investment in people</li> <li>Increased seed funding for networks, to facilitate shared projects as well as sharing of best practice, knowledge exchange and staff development</li> <li>Develop an NVQ around volunteering for STEM events aimed at engaging young people who are dis-engaged from mainstream education and/or qualification processes, also for disadvantaged adults.</li> </ul>
Sector-wide development funding	4	<ul style="list-style-type: none"> <li>Move to sector-wide development funding, at least in part.</li> <li>Have progression routes through funding so that people can apply for innovative activities and robust ones and to scale up</li> </ul>
Encourage more risk taking / innovation	4	<ul style="list-style-type: none"> <li>More corporate/industry funding for genuinely innovative PE (not just linked to STEM pipeline)</li> <li>Smaller pots of money which are easily accessible and able to take "risks".</li> <li>Funding that supports experimental work around engagement, more freedom to define purpose and with sufficient time and funding to support projects to take the time and care that is necessary to co-produce and develop programmes around STEM with the public, rather than for them</li> </ul>

## Building better links to other sectors

There was a strong push for much more partnership focused approaches, and ensuring that non-STEM focused organisations were incentivised to work with the STEM sector



### Other suggestions

Several other individual suggestions were made including:

- Increase in funds to underfunded FE in areas of deprivation
- Consider getting behind online engagement initiatives not everyone can go to conferences and be face to face.
- PhD studentships
- More funding for international partnerships (e.g. Science Learning + model)
- More explicit focus on skills, behaviours, self-efficacy and attitudes and not just funding to serve the communication of specific content areas of science.
- Ensuring that the type of funding is a good match to the types of outcomes being required e.g. is capital funding the best sort of funding to align with reaching more diverse/underserved audiences?
- Create a much more diverse set of funders - to one significant figure Wellcome is the only game in town if you're not currently a researcher or a school.
- Needs some degree or regional funding to ensure fair coverage across the UK
- Should be recognised on your CV that you have secured funding for PE as well as for research activities

Topic	No.	Typical comment
Target community /non-STEM orgs	7	<ul style="list-style-type: none"> <li>• Create a framework for the distribution of £50m of lottery funds for community PE STEM initiatives - much like Grants for the Arts, of Heritage Young Roots, or Awards for All support cultural and community development projects in the arts, heritage, social and culture sectors.</li> <li>• ability to apply for funds for collaboration with a third party, social, school, organisation (rather than them apply) as they are equally hard pressed and less experienced and so sometime are put off by this.</li> <li>• Fund at the community level rather than via STEM institutions - they are not best places to reach people. More funding that is large enough to support the development of partnerships with non STEM organisations (difficult to achieve on a £1000 grant, especially if some are required to pay 20% VAT)</li> <li>• Local authorities should be supported by a central resource in applying for funding for STEM activities, possibly through individual departments such as SEND (special education needs &amp; disabilities) offices.</li> </ul>
Build stronger links to arts	7	<ul style="list-style-type: none"> <li>• Add an A to STEM. STEAM rather than STEM. The Arts are arguably more inclusive.</li> <li>• More recognition in ACE that public engagement in science (and ecology etc etc) are Cultural.</li> <li>• More creative approaches to engaging with STEM that brings in the arts</li> <li>• I think STEM work in the cultural sector is underfunded</li> <li>• More acknowledgement in Arts Council funding streams for STEM subject based museum roles that deliver PE</li> </ul>
Target schools	5	<ul style="list-style-type: none"> <li>• Schools have to pay for our services, and with schools having tight budgets, I think it would be good for schools to have more opportunities to apply for funding for such STEM activities.</li> <li>• a platform which schools can access funding opportunities to 'buy in' activities.</li> <li>• Funds for schools to provide outreach and STEM inset training that cannot be diverted and that is aimed at the schools who do not currently provide such stuff (as otherwise the usual suspects grab all the funding)</li> <li>• Support schools that are scared of science to have STEM inset days rather than just box ticking ones</li> </ul>

# Reflections on the Forum's priorities

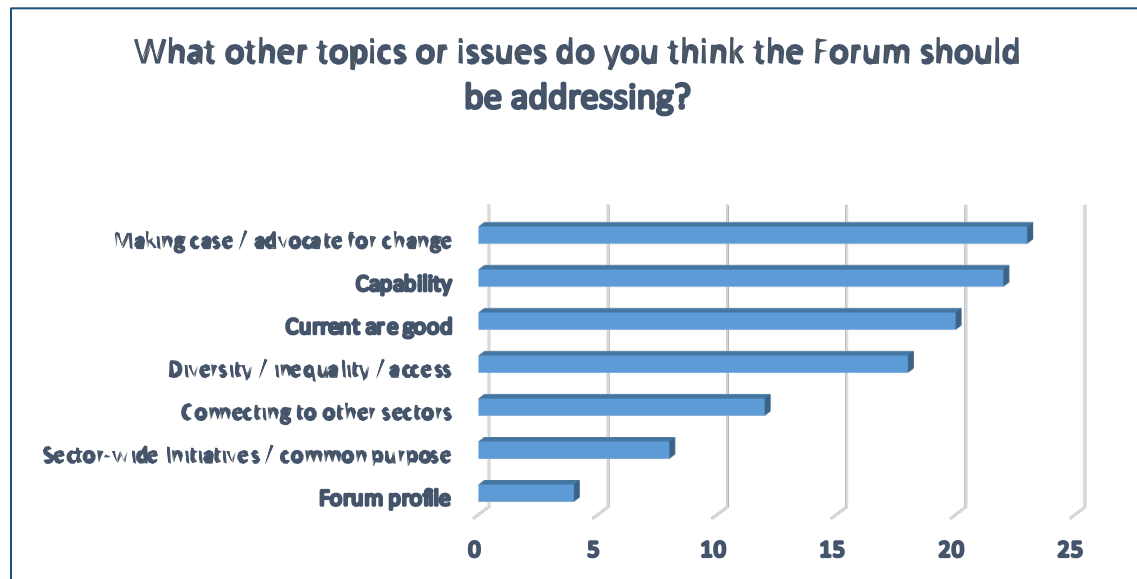
Finally, respondents were invited to reflect on the Forum's current priorities and to suggest other priority areas. There was support for the current focal points. There was also some support for the Forum playing more of an advocacy role for the sector

## What other topics or issues do you think the Forum should be addressing? (open response)

Respondents were also asked to reflect on the Forum's current priorities, which are:

- Improving models and approaches to funding
- Engaging underserved audiences
- Ensuring more effective evaluation
- Development and sharing of evidence, knowledge, resources and activity

They were invited to suggest other topics or issues which they thought the Forum should be addressing.



Topic	No.	Typical comment
Making case / advocate for change	23	<ul style="list-style-type: none"> <li>• More effectively articulating the benefits of public engagement to all parties</li> <li>• Informing the public about the process and outcomes of (publicly funded) scientific research</li> <li>• Encouraging the broadest possible cross section of society to have confidence in discussing science, and to enable decision making on science issues that is informed by data</li> <li>• Changing attitudes of universities towards PE</li> <li>• Being relevant to changing social and environmental needs (rather than whims of government policy)</li> <li>• It is important if academics and researchers are going to be involved in public engagement that this work is supported and formally recognised</li> <li>• Promoting the message that evidence based policy is essential for the critical issues facing UK plc and the world. "Knowledge is important and experts should be listened to"</li> </ul>
Capability	22	<ul style="list-style-type: none"> <li>• looking at professionalisation of PE and how to support multiple career paths</li> <li>• Bench-marking standards in training for scientists wanting to move into the field.</li> <li>• Union or supporting body for freelance public engagement professionals to ensure fair pay/industry standards etc</li> <li>• More support for fixed term contracts - very few funded roles have training and development attached, yet many people will bounce from 2 year contract to 1 year contract for up to 10 years, but won't receive any professional development unless they pay for it</li> <li>• Networking and training of professional PE fellows - those who might have got into the role through subject specialism rather than a background in social science and evaluation.</li> <li>• Encouraging reflexivity of scientists and science and those who work in STEM</li> <li>• Career pathways within the sector and professionalisation of the sector.</li> <li>• Raising awareness of Public Engagement as a career.</li> </ul>

Cont'd over

## What other topics or issues do you think the Forum should be addressing? (cont'd)

Topic	No.	Typical comment
Current are good	20	<ul style="list-style-type: none"> <li>• I believe the goals outlined are broad enough to encompass more specific ones in each of the areas identified.</li> <li>• These cover the essence of engagement</li> <li>• I think these four areas are a great place to start.</li> </ul>
Diversity / inequality / access	18	<ul style="list-style-type: none"> <li>• Social mobility / social justice and PE</li> <li>• Diversity within the public engagement sector</li> <li>• Black and Ethnic minorities</li> <li>• Disparity of opportunities in stem for schools in economically deprived areas.</li> <li>• Addressing unconscious bias, white privilege and heterosexual bias in public engagement with STEM to improve the conditions to support diversity and inclusion in the sector</li> <li>• stem career events in underserved communities</li> </ul>
Connecting to other sectors	12	<ul style="list-style-type: none"> <li>• Developing more robust and active links with other sectors to share learning, partnerships and avoid reinventing the wheel.</li> <li>• Interdisciplinary events with Arts and Humanities.</li> <li>• Links with business...access with their resources and support for their activities....</li> <li>• Helping to build meaningful partnerships between research institutes and schools/youth clubs, so that better and more in depth engagement can occur.</li> <li>• Creating partnerships between schools, researchers and organisations (probably more of a sub-topic)</li> </ul>
Sector-wide Initiatives / common purpose	8	<ul style="list-style-type: none"> <li>• Sector-wide initiatives, rather than project-based work, that works to develop the capacity and capability of those working in the sector.</li> <li>• Shared positions on pressing issues providing momentum to tackle them.</li> <li>• Providing opportunities to network/collaborate with others.</li> <li>• Another big issue is the compartmentalism. Although there is a lot of good collaboration, it doesn't go far enough and there are barriers which hold back a more powerful sharing of ideas, methods and resources. The nature of the barriers and their causes are often not well understood - often there is little awareness they exist at all. There tends to be poor strategic awareness and short term, short-sighted planning</li> </ul>
Forum profile	4	<ul style="list-style-type: none"> <li>• This is the first time I've heard of the Forum and have been working as a STEM communicator for more than 20 years...</li> <li>• Getting content on the Internet.</li> <li>• I'm really unclear about who the Forum is and what its remit is. So, a priority for the Forum, IMO, would be to clarify and communicate this</li> </ul>





## Public Engagement with STEM: Staff and Volunteers Survey

This report was developed by the NCCPE acting as secretariat to the National Forum.

**National Forum for Public  
Engagement with STEM**

**[www.publicengagement.ac.uk  
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