

# Heart and Lung Repair Shop: Evaluation Report

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## Executive summary

**A total of 2752 visitors attended the Heart and Lung Repair shop.**

**The pop-up shop was successful in engaging the local community.** Over 60% visitors participating in the lung capacity activity lived in a W postcode. Over 50% visitors found out about the shop by walking past.

**The pop-up shop was partially successful in engaging those not usually engaged with science-related activities.** Of those visiting the shop 20% visitors said that they had not participated in any science-related activities in the past year.

**Visitors were extremely positive about their experiences in the shop.** Customer review ratings (out of five) were as follows: Customer service: 4.8; Shop design: 4.5; Overall experience: 4.7.

**There were positive impacts on visitors to the pop-up shop including learning and sparking curiosity leading to visitors asking questions.** Feedback from the audience and scientist collaborators mentioned the learning occurring in the shop, particularly through discussions with scientists, and the importance of the opportunity to ask questions.

**Discussions with scientists were the most popular aspect of the shop, with many visitors interacting with the science staff and shop assistants.** For example, discussions with scientists were the most frequently mentioned activity in visitor review cards (114/202 visitors said they had spoken with a scientist) and observations (141/399 visitors were observed speaking to scientists).

**The 'repair shop' theme of the pop-up shop was confusing and required explanation to some visitors.** Scientists mentioned that some people expected to be fixed or cured in the shop, meaning that they were confused when visiting, and that one of the most challenging aspects for the science collaborators was explaining the shop to visitors who had different expectations.

**For many of the collaborators the pop-up shop was a new and innovative format for public engagement.** For 18/82 survey respondents the pop-up shop was their first experience in public engagement with science. Others who had been involved with public engagement before appreciated the innovative format of the pop-up shop and the new opportunities it offered them.

**The pop-up shop had positive impacts on the scientists and collaborators taking part,** including increasing confidence and understanding around public engagement and motivating scientists to do more public engagement.

## Introduction

This report summarises the evaluation conducted on the Heart and Lung Repair shop, the pop-up science shop in Hammersmith open from 7 – 20 July 2014. The pop-up shop was situated within a shopping mall in Hammersmith, and was open to the general public during the day throughout its residency. Visitors to the shop could take part in a number of drop-in activities, watch shop demos presented by scientists, have their lung capacity measured by a shop assistant and compare it to that of others, speak with scientists or explore the other installations, objects and displays by themselves.

The pop-up shop project was run by the Curious Act at the National Heart and Lung Institute (NHLI), Imperial College, and was funded by the Wellcome Trust.

Three guiding themes were the basis for the project and directed the content for the shop:

- Biomedical research is advancing our understanding of the function, health, disease, treatment and repair of the heart and lungs.
- Scientists and clinicians at the National Heart & Lung Institute (based in the London boroughs of Hammersmith & Fulham, Kensington, Chelsea and Westminster & Hillingdon) are at the forefront of heart and lung research. NHLI research ranges from basic science to clinical research, from bench to bedside.
- Heart and lung research cannot be isolated from the personal, social, cultural, political and ethical contexts in which it takes place and to which it applies.

It was felt that the experience of the project management team adds a valuable perspective to the documentation and evaluation of the project. It was therefore decided that the creative producer and lead scientific collaborator for the project should write a response to the evaluation findings, discussing those they felt were most interesting or surprising, to provide their own experience and examples to illustrate the evaluation findings, and to add any further points they felt were important to consider in future projects. The response is included at the end of this report.

## Event aims and objectives

The project was driven by the following aims and objectives (those which were of particular importance for the evaluation are highlighted in bold):

- Create a biomedical themed pop-up shop, located in one of the three London boroughs where NHLI is sited (Kensington & Chelsea, Hammersmith & Fulham, and Westminster), open for two weeks
- Engage audiences with cardiovascular and respiratory research and how basic science can be translated to prevent or treat diseases. Specific topics explored will include cardiac and respiratory physiology, vascular science, gene therapy, stem cell biology and tissue engineering. We will generate interest, enthusiasm and increased understanding, and stimulate discussion and debate about the social, ethical and cultural implications of the research
- **Deliver a locally relevant and accessible public engagement with science initiative, embedded in the community in which it take place and reaching new audiences who may not ordinarily choose to come to a science event. We will do this by researching the area where the shop will be located, gaining an understanding of the communities, publics and potential participants/audiences, creating links with local hospitals, schools, businesses, cultural venues, organisations and groups and promoting the shop and its programme of activities to local residents, people who work in the area and people who spend leisure time in the area**
- Create an imaginative, highly visual and interactive space for creative engagement with biomedical research through the interdisciplinary collaboration of NHLI scientists/ clinicians and professional freelance artists/designers. Collaborations will prioritise meaningful engagement with biomedical science through multi-sensory experiences and hands-on participation

- Produce a programme of activities, demonstrations, talks, workshops and performances for the pop-up shop that provides opportunities for audiences to enter into two-way discussion and dialogue with NHLI scientists
- **Experiment with, test and investigate the format of science engagement in a pop-up shop through an process of reflection, feedback and evaluation with collaborators and audiences**
- Create a YouTube channel (The Heart & Lung Repair Shopping Channel), a Twitter account, a Facebook page and web pages about the project on the NHLI website.
- **Develop the communication skills and creative public engagement experience of collaborating researchers through their involvement in the project and the opportunity to engage with a range of people including traditionally hard to reach audiences**
- Promote and market The Heart & Lung Repair Shops through social media, local and national press, local radio, posters and flyers

## Evaluation methods

Three key areas were identified as questions of importance for the evaluation to focus on, based on the event aims and objectives above:

- **Is the event reaching the local community?** Gaining an understanding of the audience- does the pop-up shop actually reach people that would not normally go to other more traditional science public engagement events?
- **Is a pop-up shop an effective format for public engagement with science?**
- **What are the impacts on the scientists involved?** Evaluate the impact of the event on the NHLI scientists involved.

In order to investigate the research questions and provide data relating to the event aims, the following evaluation methods were used:

### 1. Pre and post surveys with collaborators

Surveys were sent to collaborators to assess the impact of participating in the repair shop on the scientists, designers and other collaborators involved. Questions were designed to explore individuals' motivations and concerns before participating, and collate their reflections and suggestions for improvement after the event. The surveys were constructed using an online platform (survey monkey) and links were sent to all collaborators two weeks before the shop opened (pre), and the week following its closure (post) via the project coordinator.

A total of 33 sets of responses were received for the pre-event survey and 48 sets of responses for the post-event survey. For the pre-event survey, 32 respondents were NHLI scientists, and one was an artist/engagement collaborator. For the post-event survey 36 respondents were NHLI scientists, 6 were artist/engagement collaborators, 3 were MSc Science Communication students and 3 were other collaborators.

### 2. Customer review card

Review cards were available in the shop and visitors were encouraged to leave their feedback by shop assistant staff. The aims of the review cards were to collate information about visitors, to see the extent to which the event reaches the local community who do not usually visit science events and to gain reflections on the event itself and the pop-up shop format. Completed cards were displayed to form an installation in the window of the shop (see photo below).

A total of 169 customer review cards were completed by drop-in visitors to the shop, a further 18 were completed by students attending a debate event and 15 by visitors to an evening debate. This made a total of 202 completed cards.



Shop review cards on display.

### 3. Observations

Observations were conducted to explore the effectiveness of the pop-up shop as a format for engagement and to document the types of behaviours taking place within the shop. In particular, it was noted which aspects seemed more or less popular or successful with visitors. Observations were carried out by shop assistants at intervals throughout the day, using observation prompts. In addition, counts of visitors entering the shop were recorded to get an idea of how many people entered, and the peak times in the shop.

A total of 29 observations were carried out, totalling 7 hours and 23 minutes of observations.

### 4. Snapshot (vox pop) interviews

Short interviews were conducted with visitors to the shop in order to collate their reflections on the shop as a format for engagement with science. Similar interviews were conducted with collaborating scientists to collate their reflections on their involvement in the event. Film crew members filmed short vox pops with visitors from a range of ages, and scientists, using prompt sheets with questions. Visitors' films were introduced as 'review the Heart and Lung Repair Shop' and scientists were asked to 'tell us about your experience in the Heart and Lung Repair Shop'. Consent forms were signed by visitors appearing on film.

Snap shot interviews were conducted with 11 collaborating scientists and 19 visitors.

## **5. Social media evaluation**

Evaluation of the social media coverage of the Heart and Lung pop-up shop was conducted to assess the effectiveness of the pop-up shop format and the extent to which it generated conversation in online communities. Numbers of views, retweets, likes and comments from Twitter, Facebook and the YouTube channel were recorded.

## **6. Postcode data from lung capacity activity**

As part of the lung capacity activity in the shop, visitors were asked to provide their postcode, along with age, gender and height (for comparison to the lung capacity of others). The postcode data have been analysed to provide an indication of where the audience was visiting from, whether they were living local to the shop or travelling from further afield.

Postcode data were collected from 500 visitors.

## **7. Visitor numbers**

Visitor numbers were collected for each day of the shop opening, as well as for special events outside of normal opening hours. The numbers of visitors attending shop demos were also recorded, as well as visitors voting for which research they would most like to see funded. These numbers were analysed to give a picture of business in the shop over different periods, and contribute to determining the levels of participation with different activities.

A total number of 2752 individual visits to the shop were counted.

## **Findings**

### **Overview**

The pop-up shop was open from Monday 7 July – Sunday 20 July 2014. It received a total of 2752 visitors including those attending in the general opening hours during the day, and also special evening events. A mean of 188 visitors entered the shop each day during opening hours (a total of 2637). The quietest day was Monday 14 July (120 visitors) and busiest day was Saturday 19 July (316 visitors).

Visitors completing the lung capacity activity provided their age and gender (along with their lung capacity and height) and this data can illustrate the nature of the audience attending the shop. Visitors submitting their lung capacity data and providing their age (n=498) were a mean of 39 years old, with the youngest visitor aged 4 and the oldest 89. The mode age was 24 (20 visitors were this age). The audience visiting the shop was clearly extremely diverse in terms of age. Of those visitors participating in the lung capacity activity and providing data on their gender, 290 were female and 205 were male. This suggests a slight female bias in the audience to the shop, or perhaps a bias in participation for the lung capacity activity.

Shop demos (n=86) were watched by 610 visitors, an average of 7 visitors per demo. There were no clear patterns in terms of which times were busier or quieter in terms of attendance at the shop demos.



**Scientist presenting a shop demo.**

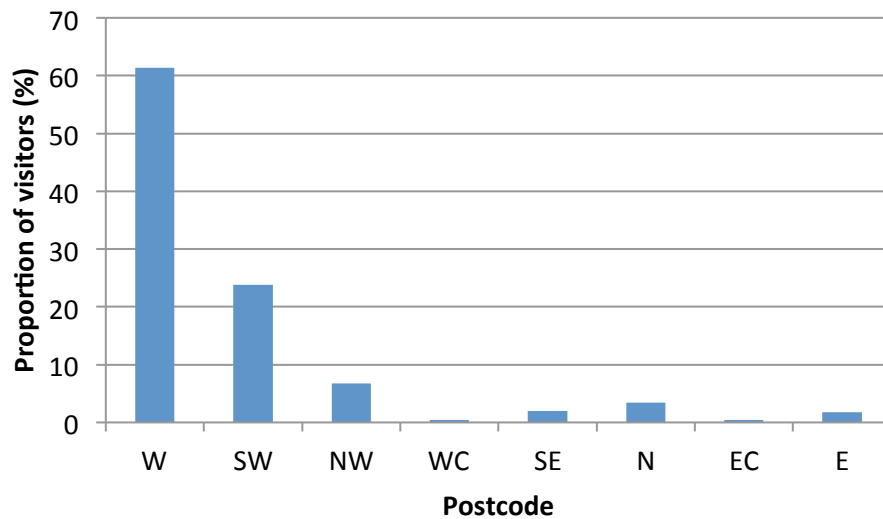
The social media reach of the pop-up shop was fairly limited and is an area which could be developed further next time. For example, over the period the shop was open, on twitter the pop-up shop (@TheCuriousAct) received 49 new followers, 33 tweets about the shop, 42 favourited tweets and 122 retweets. On Facebook the shop posted 10 posts or photos, which received a total of 11 likes, 3 shares and 1 comment. Finally, on the YouTube shopping channel associated with the project, the shop advert received 1158 views and 10 likes and the 13 videos of shop demos (mainly released after the shop closed) have to date received 643 views and 6 likes.

These data about social media engagement could be compared to social media figures for future projects, to make comparisons about the scale of engagement across different platforms and activities. This would enable indications to be made as to whether promoting an event via twitter or Facebook, for example, engages more people online for one type of event over another, and can therefore inform future decisions.

### **To what extent did the pop-up shop engage the local community?**

#### ***Were visitors local to the pop-up shop's location in Hammersmith?***

The post code data collected at the lung capacity activity showed clearly that the audience were visiting the pop-up shop from the close surrounding areas. Figure 1 shows the proportion of total visitors submitting lung capacity data in each area of postcode (n=500), and clearly shows a higher proportion of visitors from the W postcodes. The Heart and Lung Repair Shop was held in a W6 postcode. The data in Figure 1 are shown from postcodes nearest to the shop (left side of graph) to furthest away (right side of graph). For a map of locations of each postcode see the Appendix.



**Figure 1. Proportion of visitors to the shop from each postcode.**

Other evaluation findings support the postcode data in that visitors were predominantly from the local community.

In the vox pop interviews with visitors there were 15 mentions of locality (out of 19 vox pops), and 5 mentions by scientists (out of 11 vox pops). All mentions about the location of the shop suggested that visitors were from the local community as opposed to travelling to it. For example:

*I work locally, I work in IT just around the corner. (Audience)*

*A lot of time when we try to engage the public we're doing it in the university and that's very restrictive because if you're part of the university system you're naturally walking through. We're in Hammersmith now and we're just with everyone, so it's great. (Scientist)*

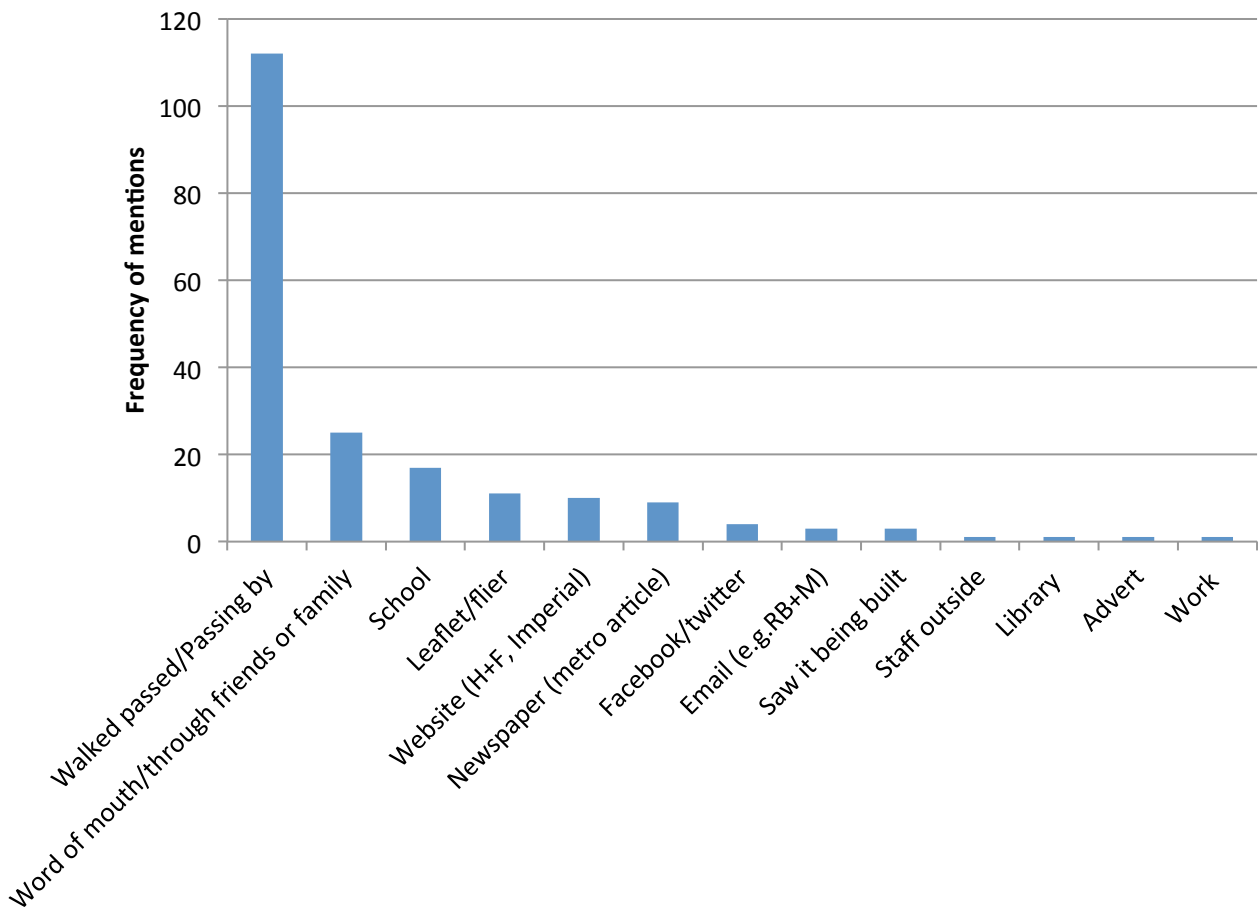
In terms of engaging the local community groups and businesses, some of the new followers on twitter gained during the opening of the pop-up shop were local businesses in Hammersmith, such as cafes and events pages.

Collaborators were asked, in post-event surveys, how they felt the audience reacted to certain aspects of the event. In relation to the location of the event, audience members were perceived by collaborators to be generally positive (17 mentions). Collaborators felt that the location enabled a diverse audience to attend (12 mentions), however some felt that there was a lower turnout than expected (4 mentions).

Collaborators thought that the location had surprised the audience (3 mentions) and made them curious (2), but were concerned that the location may have been confusing, being within a mall but not selling anything (2) and said that encouraging people into the shop was sometimes difficult (2). Other comments included that the location was convenient, the shop was visible and felt as if it was part of the local community.

In exploring how visitors found out about the event, the extent to which the project engaged the local community can again be assessed. Visitors were asked on review cards how they had found out about the pop-up shop – 198 responses to this question were received and results are presented in Figure 2.





**Figure 2. How visitors said they found out about the pop-up shop.**

The vast majority of visitors to the shop found out about it as they walked past. They were shopping in the mall, heading to the post-office or out to work and saw the shop itself. The next most frequently mentioned way of finding out about the shop was through word of mouth, visitors had been told about it by family or friends. These two main routes of finding out about the shop again suggests that the shop had successfully engaged the local community, those using the space immediately around the shop and had become a talking point amongst local family and friends. These data also suggest that the shop front was successful in attracting people to the shop who were walking past.



**The shop front in the shopping mall.**

The other findings from Figure 2 can be used to assess which deliberate advertising and marketing strategies might have been most successful, and therefore may be worth repeating for future pop-up shops. For example, the flier, information on the Hammersmith and Fulham website (<http://www.lbhf.gov.uk/>), and the article in the Metro were mentioned by visitors as having encouraged them to visit.

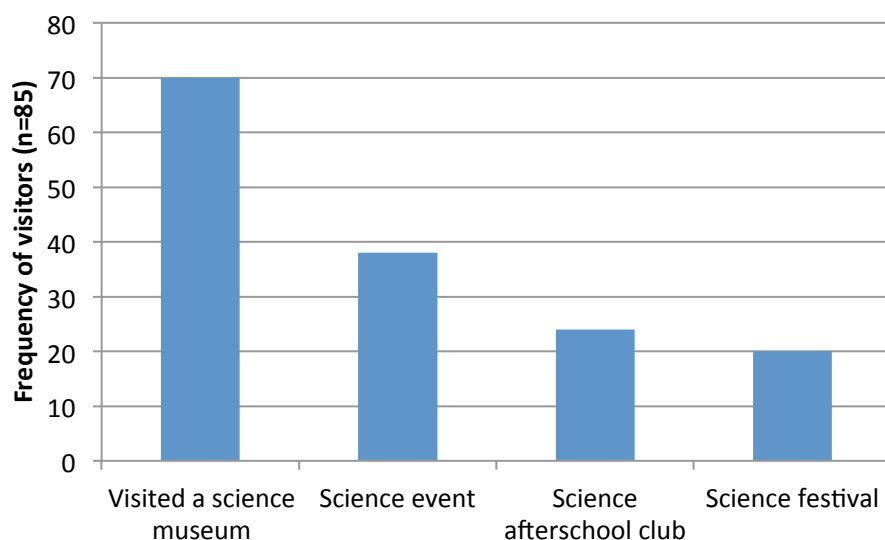
***Were visitors those not typically attending science public engagement activities?***

In engaging the local community the pop-up shop also aimed to engage those who may not traditionally visit science events, festivals or museums. Review cards asked whether visitors had attended any science related events in the past 12 months.

Of the 202 visitors completing review cards, 20% had not been to any science-related events in the past 12 months, 42% had been to at least one, and 38% left this question unanswered. These data suggest that the pop-up shop was partially successful in engaging those who do not usually attend science related activities.

It should be noted, however, that not all visitors to the shop filled out review cards and that there is the possibility of a bias in those that did. For example, it may be that visitors who had previous experience of public engagement events and science activities, who were perhaps more comfortable in the space and used to providing feedback, were more encouraged and motivated to fill out the review cards. Those who had little or no experience with similar events may not have been as likely to fill out the cards. Therefore, the figure of 20% of visitors not attending any science related events in the past 12 months might be thought of as a bottom-end figure, the true figure for the whole audience is likely to have been higher than this.

Of the events visitors reported having attending in the past 12 months (n=85), science museums were the most popular, see Figure 3 below.



**Figure 3. Science related activities attended by pop-up shop visitors in the past 12 months.**

Visitors who had attended a science related activity were most likely to have visited a science museum, compared to other options such as the science festival. This information may be useful in considering what types of activity visitors may enjoy and have experienced before, and what may be new or different to them, when making decisions as to what to include in a future pop-up shop.

Visitors were asked how they felt the pop-up shop compared to other science events they had experienced (74 comments in total). The most frequently mentioned themes were: the pop-up shop was more interactive and engaging (20), the pop-up shop was as good as anything else experienced (16), the pop-up shop had more people to interact with which was a good thing (11), and that it was different but the visitor could not explain how or why (8). Other comments included that the pop-up shop was less crowded and that it was more educational, however some visitors felt that there could have been more activities in the shop as the experience was quite short.

These findings may be useful in considering where pop-up shops ‘fit’ amongst the other opportunities for public engagement with science, what they can offer which might be different to others in the field, and where they might complement and contrast other science related activities visitors might experience.

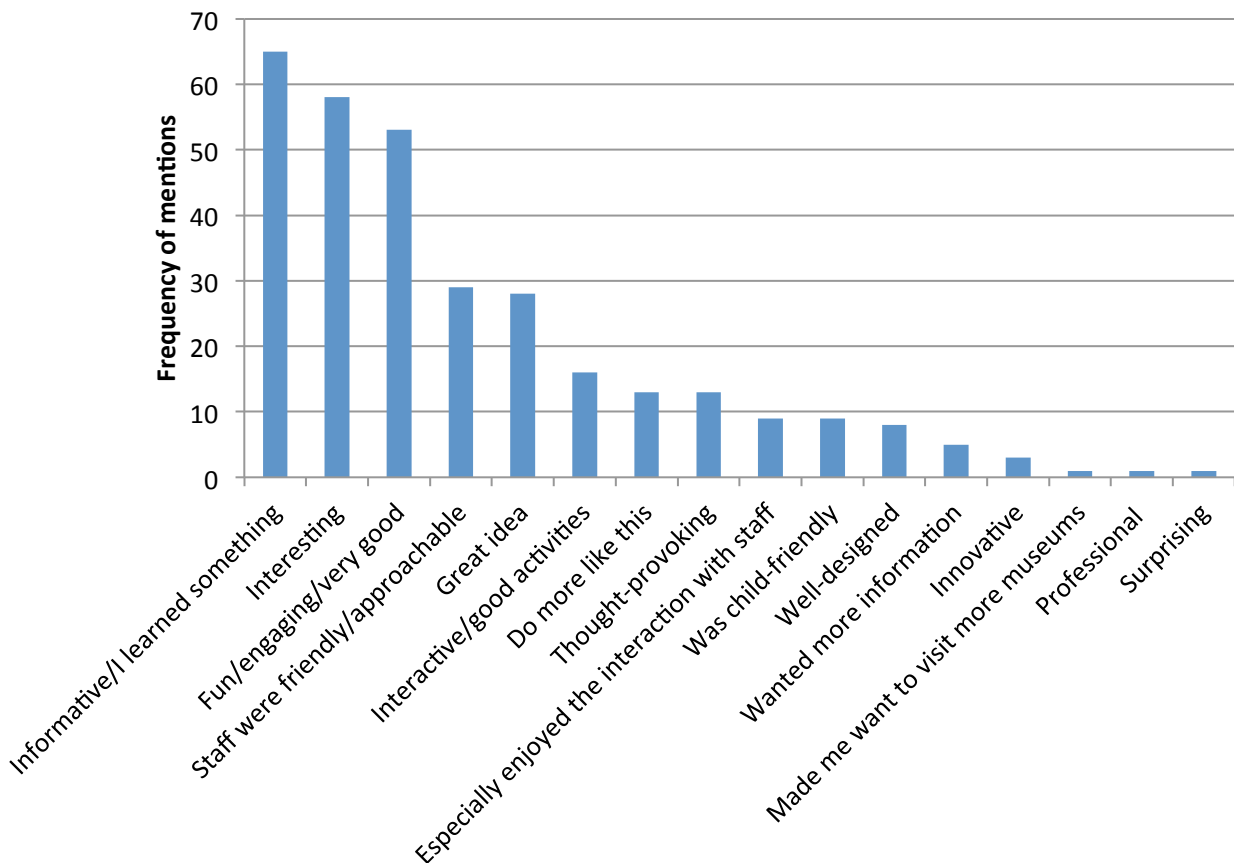
## Was a pop-up shop an effective format for public engagement with science?

### *Customer reviews*

Reviews of the pop-up shop were collated from visitors using customer review cards (n=202). Feedback about the shop was extremely positive from visitors. The average rating of three aspects of the event, out of a total of five stars, was:

- Customer service: 4.8
- Shop design: 4.5
- Overall experience: 4.7

Open responses written by visitors on the review cards revealed the reasons behind such positive ratings. Comments have been categorised into similar themes, and the frequencies of mentions presented below in Figure 4 (n=312).



**Figure 4. Comments made about the shop in open section of visitor review cards.**

The open comments indicate the value placed on learning by visitors – they enjoyed being able to learn something from the shop. Visitors also found the shop interesting and fun. The friendly nature of the staff was mentioned, and visitors spoke about how they were inviting and approachable, which put visitors at ease.

There were subtle differences between the three contexts where review cards were collected from – the general visitors to the shop, students at a debate workshop and visitors to an evening event. Students were more likely to say that their experience was fun compared to the other audiences (40% total comments, compared to 15% of the general visitors and 14% of the evening debate visitors). Furthermore, adults attending the evening debate were more likely to say that their experience had been thought-provoking, compared to other visitors (19% total comments, compared to 3% general visitors and none of the students).

Vox pop interviews were conducted with 19 visitors, and comments revealed some of the ways in which the pop-up shop impacted the visitors and was an effective method of engagement (16 comments). For example, the visitors learned about science as a result of visiting the pop-up shop:

*I'm particularly excited about that as well as just more general application, learning a bit more about the fact that stem cells in two varieties can come from the bone marrow, provide different benefits from different types. It's really interesting, very enjoyable to have a chat about this as well.*

Comments from the vox pops about learning fit with the open responses from the review cards (Figure 4) about enjoying learning something new and the shop being informative.

Furthermore, visitors spoke about how much they enjoyed the experience and even said that it had helped make their mind up about future study and careers:

*I really enjoyed it and I've learnt lots of things that I didn't know before. It's really inspired me because I want to be a doctor when I'm older and it's sort-of made me want to do it even more.*

Visitors reported that the interaction with the scientist was the most important aspect of the event for them, again complementing the findings from the open responses on the review cards:

*The people involved, the scientists and everyone involved have been very informative and knowledgeable and what they had to say made a lot of practical sense and it's a good thing.*

### **Engagement behaviours within the shop**

As part of the review cards visitors were asked to indicate what activities they had taken part in during their visit to the shop. From a total of 202 respondents, 114 said that they had spoken to a scientist, 84 had participated in the lung capacity activity, and 81 had watched a talk or shop demo. These figures give an indication as to what were the most popular activities within the shop and the proportions of total visitors that are engaging with different activities.

Observations were also carried out, which enables an idea to be formed as to how visitors engaged with the shop and its content. Visits were on average 15 minutes in length, ranging from 1 to 55 minutes (n=29).

Patterns could be observed in the observations of visits: visitors often spoke to a scientist or shop assistant first, before moving onto the 'future challenges' activities, the microscope (see picture below) or the lab bench – all of which seemed to be useful starting points for engagement and were encouraged by the scientists. Visitors were attracted to the lung capacity activity later in the visit, and often had to wait to take part – sometimes looking at the heart and lung machine or the diagnostic tools while they waited. Thirteen visitors (out of 29 observed) had their lung capacity measured.

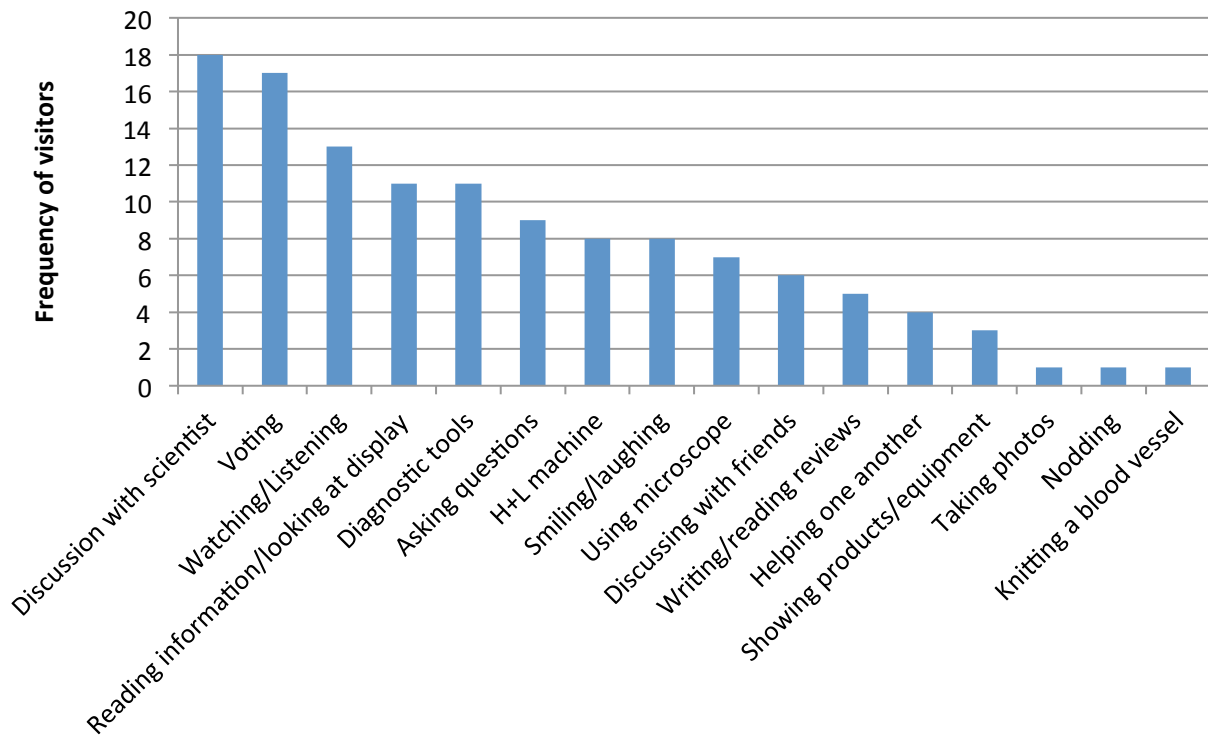


**Visitors looking through the microscope in the shop.**

This quote from the observation notes provides an example of a typical visit by a mother (age around 35) and daughter:

*Walks in and looks at heart and lung machine. Is shown by shop assistant. Daughter has a go on lung side while mother explains. Walks over to diagnostic tools, mum shows how to use stethoscope. Goes over to lab bench. Scientist shows microscope while mother watches. Walk to lung capacity where is queue, so goes back to diagnostic tools. Then they go and look at a nearby product display. Go back to lung capacity but still queue so go and use blood pressure instrument sits in a queue for the lung capacity. Chats to shop assistant who gives programme. Goes and gets lung capacity (mother & daughter). Once done, they leave.*

A focus visitor was selected for each observation, and behaviours, reactions and actions were noted for this visitor in detail. Figure 5 shows the breakdown of different behaviours for each observed visitor. Visitors were selected at random as they entered the shop, and observed for the duration of their visit. Focus visitors were involved in a range of activities when they were being observed, so the relating data shows overall patterns of behaviours over a whole visit. This provides a rough overview of the types of behaviours and engagement within the shop, and an indication of frequency.



**Figure 5. Behaviours observed for focus visitors throughout their experience in the shop.**

A range of behaviours were observed – both for the focus visitor in each observation, but also general visitors in the shop at the same time, taking part in four different areas of activities around the shop: contributing lung data, talking with scientists, watching demos and browsing the shop. Some differences in behaviours were noticeable when comparing observation data. For example, whilst contributing lung data visitors were smiling and laughing more than whilst they were watching demos or browsing the shop, however they asked more questions when they were watching the demos or speaking with scientists.

During the observations, 399 visitors were observed to enter the shop – meaning an average of just under one visitor entering every minute. In the observation period 141 visitors spoke to scientists, 104 browsed the shop activities and content self-guided, 102 watched the shop demos, and 66 had their lung capacity measured. This, again, highlights the popularity of the interactions with scientists for visitors to the shop.

The most popular activities, as concluded from the observation data, were interacting with scientists, and the voting activities. Visitors had a number of opportunities to interact with scientists around different activities, depending on which scientists were working in the shop on a particular day. For example, visitors might have spoken to scientists at the lab bench area, whilst looking at specimens under the microscope, whilst debating voting activities or following a shop demo. The friendly and approachable nature of the science staff in the shop was mentioned in the open responses on the visitor review cards, figure 4.

Voting in the ‘future challenges’ activity was also popular with the visitors. This activity involved visitors choosing which of the different scenarios they thought was most important for the future of heart and lung repair, and was often a talking point between the scientists and the visitors (see picture below). A total of 1569 votes were received for the future challenges activity – equal to 57% of the total visitors entering the shop casting a vote which is a high proportion of the audience engaging with this content. The results of the votes were as follows:

Future challenge	Votes
Build a heart	184
Make healthy cigarettes	278
Repair your own organs	699
Better treatments for cancer	408



**A visitor considering his vote in the ‘future challenges’ activity.**

Another way visitors could express their opinions and engage with the science content was in the ‘what do you think’ voting continuums. Questions about science research were posed to the visitors, who were asked to vote on a scale according to the extent to which they agreed or disagreed. The picture below shows an example, and examples of the statements posed to the visitors included:

- It is more important for scientists to create treatments for a very severe condition affecting a small number of people than for a milder condition affecting many people
- People who make unhealthy or risky lifestyle choices should pay more for their healthcare
- It is more important for scientists to create treatments that are the best in the world than treatments that are cheap and affordable to all





**Voting continuum activity in the pop-up shop.**

### ***Reflections from collaborators on audience engagement***

The scientists working in the shop presenting the different activities also reflected on how the pop-up shop worked as a format for public engagement. Ten comments were made by scientists in vox pop interviews (total of 11) about the engagement of the audience. The following quote exemplifies these comments, speaking about how visitors often brought their own stories to the conversation as well as being interested in the work of the scientists:

*It's been really varied but on the most part people have really engaged with us and really been interested in what we're doing and often have a story to tell about their own experience in the medical system and want to tell us that.*

Other scientists mentioned the questions that the visitors arrived with (3 mentions), for example:

*I think the questions are really quite intriguing because I've realized that people are quite informed, they know about some of the devices, they are very curious about stem cells.*

This scientist understood more about the audience following the event, and also comments on how engaged the audience were – being curious about stem cells.

Scientists and other collaborators were asked in post-event surveys for their reflections as to how the audience responded to different aspects of the event. When speaking about how the audience responded to the science content of the shop, collaborators noted that visitors were interested and asked questions (10 mentions), were generally positive (6) and particularly enjoyed the hands-on aspects (5). Other responses included that visitors enjoyed learning about therapies (3) and enjoyed the discussions (2). Some collaborators felt that they experienced a range of responses of the audience to the content (2) and others felt that more science content was required (2).

In relation to discussions with scientists, the collaborators felt that the audience were positive (13 collaborators mentioned a general positive response by the audience), and that there were many interesting questions from the audience sparking good discussions (13 mentions). Other collaborators said that there was some confusion amongst the audience about what scientists did (3), and others mentioned that visitors were surprised or found it novel (3) and had trust that they were speaking with experts (2).

Collaborators felt that the audience were confused by the repair shop theme and that this needed more explanation (19 mentions). The quote from this collaborator illustrates where the confusion about the repair shop theme arose:

*Some members of the public misunderstood the concept and were looking for health advice instead.*

This confusion was mentioned by scientists in a number of different survey responses, and is something which should be addressed for future projects.

Other collaborators spoke of a general positive reaction of the audience to the repair shop theme (5) and about how much the audience enjoyed the design and look of the space (5). The repair shop theme was seen to be perceived as accessible (1 mention) and surprising (1 mention).

In relation to the 'pop up' nature of the shop, collaborators felt that the audience responded positively (10 mentions). Visitors asked when the next pop-up shop would be (4 mentions), found it intriguing (4) and collaborators reported that the nature of the shop gave a sense of urgency (4). Four collaborators commented that the duration of opening for the shop was just the right length. Others felt that it could have been open for longer (2), that visitors found it confusing (2), and that it needed more advertising (2). These responses indicate that the pop-up 'limited time only' nature of the shop worked well to increase the hype and excitement around the shop, creating a motivation for visitors to attend 'before it's too late'.

One key aspect of the pop-up shop was the collaboration between scientists and designers. Collaborators were asked in the post-event survey what they thought about this, in relation to public engagement with science, with 16 (out of the 32 answering) saying that they felt it worked well to make science more accessible, attractive and interesting. A further four said that it led to interesting outcomes, and three said that it was fundamental to the project. However, nine respondents felt that the collaboration was limited, that there needed to be more science input and could have benefited from more time and development.

## What were the impacts on the scientists and collaborators involved?

### ***Previous experience with public engagement***

The Heart and Lung Repair Shop was the first public engagement event some of the collaborators had taken part in (pre-event survey – 11/33 said they had not participated in public engagement before; post-event survey – 7/48 said they had not participated in any public engagement before). Previous experience of public engagement, mentioned in the pre-event survey, came predominantly from the Imperial festival (10 collaborators) but also from museum late events (6 collaborators) and festivals and research open days.

Compared to other public engagement events, collaborators described the Heart and Lung Repair Shop as involving a more diverse audience in many ways (in terms of scientific knowledge, interest, age and background) (11 comments) and as accessing an audience not already interested in science (5 comments). Collaborators felt that there was a similar level of audience engagement in the pop-up shop compared to other public engagement they have participated in (9 comments).

In the vox pop interviews with scientists 17 comments were made about how the event provided a different and new opportunity for the scientists to speak to the public about their work. Scientists were positive about this new public engagement experience and enjoyed it:

*It's really good actually, I mean I've had some experiences talking to members of the public before but nothing quite like this so I've found it fantastic to be honest*

### ***Scientists' expectations before the event***

Scientists were motivated to get involved in the pop-up shop by a feeling that it was important and because they wanted to get the public interested in science (9 collaborators). A further eight collaborators were expecting it to be fun, five said it sounded like a new and interesting idea, and five thought that it would be a good experience to have done. Other reasons scientists gave for deciding to be involved included feeling like it was a good opportunity to showcase their work (4), interact with a new audience (4) and due to encouragement from a more senior colleague (2).

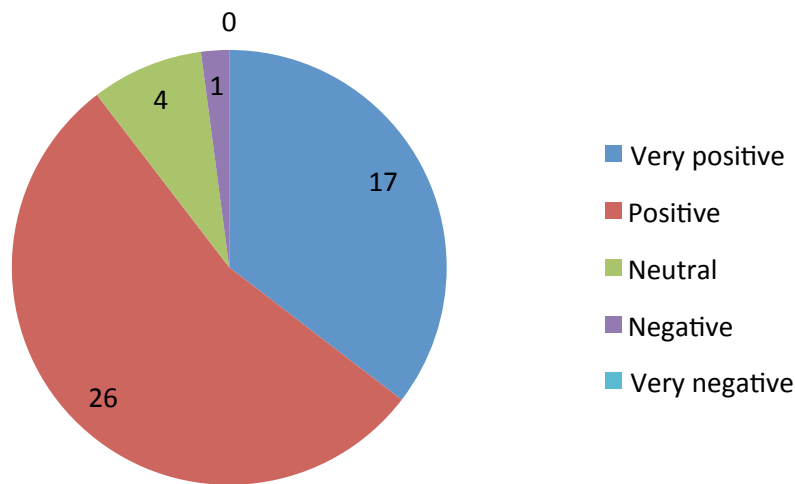
Before the event, scientists were fairly confident about participating with few concerns – 10 said they had no concerns at all. Nine scientists were concerned about the time commitment required and five were unsure what to expect from the event. Other concerns listed by scientists included uncertainty about how best to engage the visitors (3), explaining science to a new audience (1), potential reactions from animal research groups (1), and a lack of personal experience with public engagement (1).

Before the event scientists were mostly looking forward to meeting the visitors to the shop (12), seeing the finished shop design (5), sharing their knowledge (4) and gaining an insight into public perceptions of the area of science (3).

These findings show that scientists were very positive before the start of the event, with only a few concerns which were mostly around time requirements. Scientists were driven to participate by feelings that the public should know more about science, and thought that it would be fun and worthwhile to be involved in.

### ***How collaborators rated their experiences***

Feedback was also collated from collaborators following the event to explore their perceptions of the pop-up shop. Overall collaborators were positive about their experiences, see Figure 6.



**Figure 6. How collaborators rated their overall experience of being involved in the pop-up shop**

The overwhelming majority of the collaborators were extremely positive about their experiences. The one ‘negative’ response related to wanting to have more involvement in the science content within the shop.

Reasons for the other ratings provided by collaborators included: the experience was fun/enjoyable (9), collaborators enjoyed speaking to interested publics (6) and it was a good opportunity for public engagement (6). Other comments included that the experience was rewarding (2), they knew a clear focus for what they would be doing (2) and enjoying the collaboration (1).

The top mentioned most rewarding aspects mentioned in the collaborators’ post-event survey included: Interest/enthusiasm of the visitors (16), especially the enthusiasm of the younger visitors (7), teamwork/the collaboration (4) and engaging those not normally engaging with science (3).

The top most challenging aspects mentioned by collaborators in the post-event survey, included: handling visitors’ expectations about getting a cure/medical treatment (13), getting people into the shop and interested (8) and explaining science at the right level for the varied audience (8).

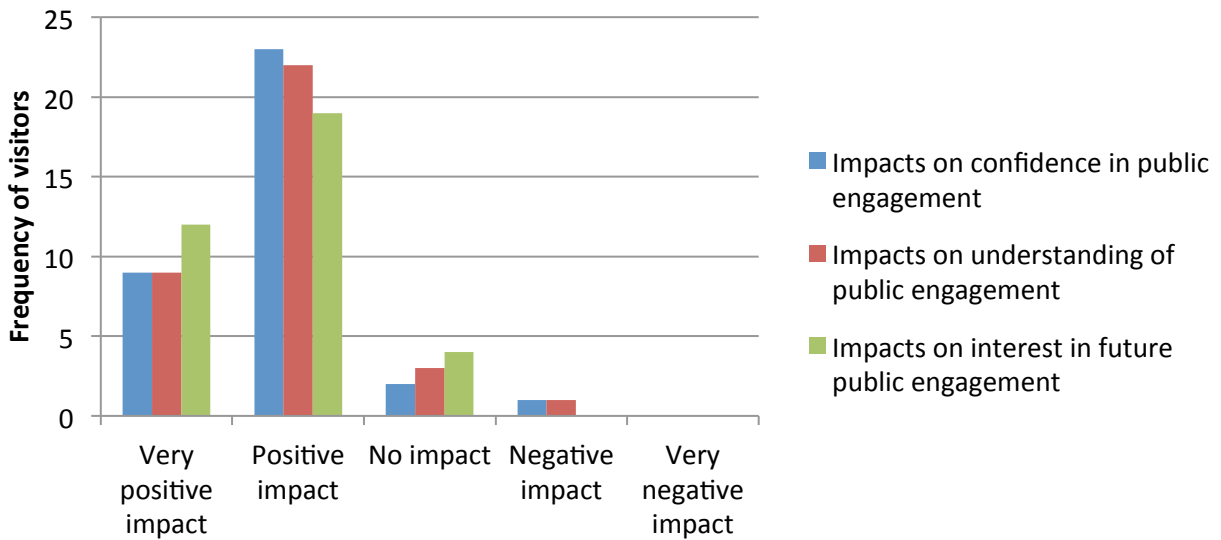
Compared to other public engagement activities they had been involved in, 8 collaborators said that they preferred the pop-up shop format, as it felt that it had more impact, was more genuine, involved a wider diversity of audience and was better organised. Five collaborators said that they enjoyed the pop-up shop as much as other events but not more, as they said that they enjoyed the buzz or atmosphere of something like a festival, but that it was important to engage the local community as the pop-up shop did. A further six collaborators said that they preferred doing public engagement at a science festival or museum as there was a more interested audience meaning discussions were more focused around learning.



Scientists taking part in an evening debate event.

**Self-reported impacts on scientists**

Collaborators were asked what impact taking part in the pop-up shop had on different aspects of their practice. The results are positive, and shown in Figure 7.



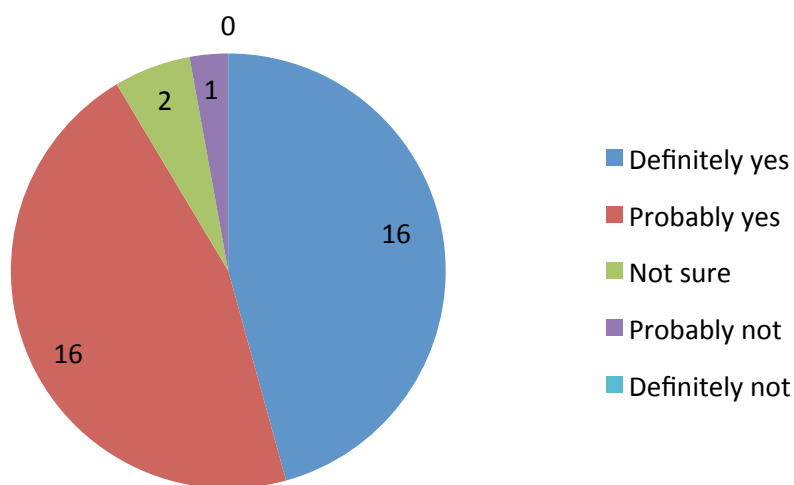
**Figure 7. How the pop-up shop impacted on different aspects for scientists.**

Figure 7 shows a very positive picture of how the pop-up shop enabled scientists to build confidence in public engagement, understanding of what public engagement entailed, and encouraged them to be involved in similar activities in future. In particular the motivation to get involved in public engagement in the future had the most collaborators selecting ‘very positive impact’, similarly confidence in public engagement was shown to be most ‘positively impacted’ by many collaborators. These data may be important not only in documenting the impacts of the current project, but also in recruiting scientific collaborators for future events. For those scientists selecting that the pop-up shop had a negative impact,

reasons included that the engagement had been too open and the scientist was unsure what to expect from the audience, and another said that the repair shop theme had caused confusion with the audience which had not been enjoyable for the scientist.

Collaborators were asked whether their participation and experiences in the pop-up shop had led to any impacts on the way they think about their own scientific research. Out of 24 answering this question, 14 said that it had some impact on their work, including highlighting the importance of communicating science to the public in an accessible way, bringing a new appreciation of their own work, reconsidering the importance of design and setting alongside public engagement, and motivating them to do more public engagement.

Finally, collaborators were asked whether they would like to be involved in another pop-up shop in future. The results are shown in Figure 8.



**Figure 8. Frequency of collaborators indicating whether they would get involved in a future pop-up shop.**

For those saying 'definitely yes', reasons were that it was rewarding and important. Collaborators selecting 'probably yes' agreed that it had been an enjoyable and worthwhile experience but also mentioned that it had also been a large time commitment (and hence were not 'definite' about being involved another time). Collaborators who were 'not sure' or who said they would 'probably not' get involved again, felt unconvinced by the format, which they felt was not educational enough, and felt that the event needed more publicity in the run up to ensure a large audience.

## Conclusions

The pop-up shop was organised in order to experiment with and develop a new public engagement format, facilitate collaboration between scientists and artists/designers, and engage the local community with the science conducted at the National Heart and Lung Institute. Feedback was gained from a number of different sources and audiences to form this evaluation report, ensuring that triangulation of data could be carried out where possible.

To conclude, I return to the original aims of the evaluation report and the event objectives.

- **Deliver a locally relevant and accessible public engagement with science initiative, embedded in the community in which it take place and reaching new audiences who may not ordinarily choose to come to a science event.**

The Heart and Lung Repair Shop was successful in engaging the local community. Evidence for this can be seen in postcode data from the lung capacity activity, audience responses as to how they found out about the event from the review cards, and mentions about the location of the pop-up shop from collaborators and audience from vox pops.

There may be room for improvement in engaging audiences not normally choosing to engage with science activities. Whilst 20% of visitors filling in review cards (n=202) had not been to any science event in the past year, 42% had been to at least one, with the most popular science related activity being a visit to a science museum. Visitors spoke about how the pop-up shop differed from any science related activities they had attended before, including that pop-up shops enabled them to speak with members of science staff and ask questions.

- **Experiment with, test and investigate the format of science engagement in a pop-up shop through an process of reflection, feedback and evaluation with collaborators and audiences**

The pop-up shop was a successful format of public engagement with science and would be a fruitful direction to explore further with different science topics and new locations. Overall reviews from visitors were very positive in terms of the ranking of different aspects of the shop. The activities in the shop enabled audiences to learn new information, spark their interest in the heart and lung science, have fun and ask questions (all reported by visitors in evaluations). These impacts tie into another objective for the project: 'We will generate interest, enthusiasm and increased understanding, and stimulate discussion and debate about the social, ethical and cultural implications of the research'.

The 'pop up' nature of the event added urgency and excitement to the event, meaning that visitors felt inclined to visit 'before it's too late'. The location worked extremely well in engaging passers-by, and contributed to the success of the event in engaging the immediate local community.

There was confusion about the 'repair shop' theme, noted by collaborators – visitors understood that the shop may be a place where they could get 'fixed' or a cure. Dealing with visitor expectations of this nature and explaining the different aims of the shop was a major challenge for the collaborators, and future shops could ensure that the themes do not cause this confusion.

- **Develop the communication skills and creative public engagement experience of collaborating researchers through their involvement in the project and the opportunity to engage with a range of people including traditionally hard to reach audiences**

The pop-up shop had a positive effect on the collaborating scientists. Collaborators reported positive impacts on their confidence, understanding and motivations around public engagement activities, and were extremely positive about being involved in future pop-up shop projects. Collaborators revealed that the pop-up shop experience had led them to consider the importance of communicating science to the public, gain a new appreciation for their work, and understand more about the diversity of audience levels of background knowledge and interests.

Further aims were posed for the pop-up shop (see above), some of which the evaluation report has gone some way to addressing. For example, one objective was to create an imaginative, highly visual and interactive space. Figure 4 shows that the responses from visitors on the review cards include that audiences felt that the space was interactive, interesting and well-designed. Visitors also felt that the pop-up shop was more engaging and interactive than other science-related events they had experienced (20/74 comments).

Another aim for the pop-up shop was to create multi-sensory and hands-on experiences. Observation data shows that there were many different behaviours enacted by visitors in the shop – many of which were hands-on, for example manipulating the microscope, voting or contributing lung capacity data. Further

iterations could extend the multi-sensory aspects of the shop; whilst some activities and shop demos for example had multisensory aspects, these could have been more frequent and prominent for general visitors browsing the shop.

Another aim was to promote the event by social media. An advert for the shop was recorded and put onto YouTube, and twitter and Facebook were used for some promotion. Whilst there were some views, retweets, comments, likes and shares, a more focused effort could be made next time in terms of social media promotion, in order to ensure that as wide a network of people as possible know about the event.

The final project aim relevant to some of the evaluation data is encouraging collaboration between scientists and designers. The finished shop attracted attention and praise from both visitors and collaborators, due to the interesting and professional design. Scientists also mentioned how they enjoyed the collaborative aspects of the project, reporting that they felt that the collaboration made science more accessible, attractive and interesting. However, other scientists found the collaboration more challenging, said that it required more time than was available, and that the project required more scientific input to balance the design aspects. The balance of the collaboration is something which could be developed in future iterations.

## Recommendations

The following recommendations are suggested for future pop-up shop projects, building from the evaluation of the Heart and Lung Repair Shop:

- Continue to use pop-up shop as a format for direct public interaction with scientists, this worked well, was popular with both parties and led to impacts for both audiences and collaborators.
- More promotion may be necessary to increase visitor attendance. Particularly promotion on social media could be further developed.
- Continue to encourage collaboration between scientists and artists/engagers, as this resulted in an attractive, well-designed and informative space.
- Ensure that collaboration between scientists and artists/designers begins early on in the project to ensure meaningful collaborative work and balance input from both parties.
- Continue to facilitate direct interaction between scientists and audience members as this was popular in the shop, valued by both visitors and scientists, and led to fruitful and interesting discussions.
- Refine the theme and name of the shop so as not to confuse visitors thinking that they will be 'repaired'.
- Activities where visitors could contribute their own knowledge, opinions or data worked well to facilitate the interactive and accessible nature of the shop – for example the lung capacity activity or the voting activities.
- Future pop-up shops could look for similar locations within empty spaces in malls – the location was successful in terms of attracting people into the shop who were just walking past on their way to/from somewhere.

Overall the pop-up shop was successful on a number of levels and it seems that there would be much promise in repeating the format again. The recommendations above could be explored to further increase the effectiveness and impacts on both visitors and collaborators.



## Response to evaluation findings from project management team

By Ellen Dowell (Creative Producer) and Sara Rankin (Lead Science Collaborator)

The two week adventure of The Heart and Lung Repair Shop was full of highlights: the launch event attended by the Mayor of Hammersmith, a child's first view of beating heart cells under a microscope, five minute talks that led to 20 minute audience discussions, debating the future of heart and lung research with 25 fourteen year olds from Hammersmith Academy and much more.

A huge amount of imagination, time and effort went into the planning, design, development, build and delivery of the shop; involving scientists, designers and three MSc Science Communication students who took the role of shop assistants.



The enthusiasm of the audience was far greater than we expected, including return visits day after day from people on their lunch breaks and teenagers popping in after school. The dedication of the scientists who facilitated the shop was vital to its success as they brought the shop alive by exchanging knowledge, stories, perspectives and ideas with the Hammersmith community.

Overall the evaluation findings show that The Heart and Lung Repair Shop was broadly successful in achieving its aims. It is great to see that the most popular activity in the shop was directly interacting with scientists; one of the core strengths of the project was the large number of scientists involved, meaning that there were always at least four (and often as many as eight) researchers available to chat to visitors.

We were pleased with the average 15 minute experience for visitors as it was intended to be a drop-in activity that people could fit into their everyday lives, between running errands or before popping to the shops. On reflection, however, we did feel that there should have been one or two additional activities incorporated into the audience experience to give the potential for a longer engagement, which there was an appetite for, and to encourage more repeat visitors.

Although some people mentioned that the audience numbers for the shop could have been higher, and it did feel quiet on a few days, we in fact reached more people than predicted (2750 over two weeks compared to 2240 predicted) and a comparable university pop-up shop in Birmingham in 2014 received 2500 visitors over three weeks. We were very happy that the project so clearly met its aim of engaging with the local community and that the project attracted visitors from such a diverse age range.

The key disadvantage of the project from our perspective was the very tight time frame between securing the retail unit and delivering the project. This led to some comments from collaborators about the need for a more in depth process to develop the content of the shop, which would have happened had the retail unit been confirmed earlier. A significant improvement for future projects would be to secure the retail unit further in advance of the project delivery date, giving more time for the content of the shop to be developed and for the collaborative process between scientists and arts/engagement practitioners. Better promotion and use of social media would also happen as a result of having a less time pressured development period for the shop, enabling more time to be spent on publicity.

The repair shop concept did cause confusion for some visitors who initially understood it to be a place where they could receive medical advice. In response to this misunderstanding we placed signage at the entrance of the shop explaining that The Heart and Lung Repair Shop was a project about heart and lung research and if people had concerns about their own health they should see their GP. Despite this difficulty, 'The Heart and Lung Repair Shop' title was perceived as attractive and intriguing, evidenced by being picked up by the Metro's London To Do List. There is a clear lesson to learn about managing the audience's expectations about the purpose of the project, but we believe this can still be achieved while creating an intriguing concept that sparks people's curiosity.

Overall we were very pleased with the achievements of the project, the valuable lessons learnt through experimenting with the pop-up shop format as a means of science engagement, the high level of commitment from scientists who participated in the project and the excellent engagement with the Hammersmith community, which we hope to develop and build on in the future.

## Appendix

Map of post-codes in London

