

Impact case study (REF3)

Institution: University of Reading		
Unit of Assessment: 32 Art and Design: History, Practice and Theory		
Title of case study: Transforming understanding of antimicrobial resistance through communication design		
Period when the underpinning research was undertaken: 2014 – 2020.		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Sue Walker	Professor	01/10/1980 – present
Period when the claimed impact occurred: 2018 – 2020.		
Is this case study continued from a case study submitted in 2014? N		
<p>1. Summary of the impact</p> <p>Antimicrobial resistance (AMR) is a global crisis. We need to raise awareness of the dangers of antibiotic misuse and how it can be prevented. Walker's research has influenced ways of communicating information about AMR in community pharmacies. Impact is shown through increased professional and public understanding and awareness of antibiotic resistance, and improved working practices in community pharmacies in the UK and Rwanda. Organisations have benefitted, including Public Health England, the Commonwealth Pharmacy Association (CPA) and the Rwandan Community Pharmacists' Union (RCPU), who now recognise that design-led approaches enable effective and relevant public health communication. The impact has been further extended to benefit cross-disciplinary approaches to public health communication beyond AMR.</p>		
<p>2. Underpinning research</p> <p>The underpinning research is concerned with the communication and public engagement challenges around the global antimicrobial resistance crisis. Working across disciplines and organisations, research in the UK and Rwanda used co-design to raise awareness in communities, and among practitioners, of a crisis that threatens to transform the effectiveness of taken-for-granted medicine. Stakeholder and end-user engagement was key to ensuring effective benefit and reach of the research.</p> <p>A strand of research was concerned with investigating information design solutions and their application in health communication from an historical perspective. It included research on the Isotype Institute's approach to health communication, such as a poster campaign in 1930s USA that raised awareness of the danger of TB. This research identified principles of effective health communication that could be applied to antimicrobial resistance and other health issues today.</p> <p>In the UK, the AHRC-funded research project, 'Information Design and Architecture in Persuasive Pharmacy Space: combating AMR', [IDAPPS] aimed to improve knowledge and understanding of AMR with perspectives offered by information design, human factors, architecture and pharmacy, and input from pharmacists, pharmacy users and patients. The project partnered with a Day Lewis pharmacy ensuring the input of pharmacy practitioners as well as providing a realistic location in which to situate the research.</p> <p>Innovative co-design used a competition format to produce 5 approaches to explaining the dangers of AMR and how to avoid it in the context of community pharmacies. One winning solution was explored in a second research project following the CPA's interest in one of the prototypes. This research in Rwanda, which resulted in the Beat Bad Microbes campaign, involved development and iterative review of a set of materials about antibiotic resistance in English and Kinyarwanda languages.</p>		

The research demonstrated the benefits of user-centred approaches to design, including the engagement of the public and other stakeholders with research. Positive feedback about our explanations of drug-resistant infection has demonstrated the relevance and significance of effective design of this kind of information, especially the design of procedural instructional text, checklists for action, and illustrative material. The research also affirmed that community pharmacies both in the UK and in Rwanda are convenient, socially inclusive locations to distribute information about AMR. It confirmed that pharmacists and pharmacy workers are both willing to be involved and have a key role to play in engaging people with information about antimicrobial resistance but established that they have limited time to do so, and therefore need efficient persuasive resources.

The research was disseminated in several ways including:

- Invited displays of IDAPPS work including exhibitions at Design4Health, Sheffield Hallam University, September 2018; at AHRC event at London Design Week, September 2018; and at the Day Lewis National Conference, London, November 2018.
- Invited presentations about the work: RCPU international conference in Kigali, September 2019; webinar to Q community, October 2019.
- IDAPPS digital exhibition 'Towards the persuasive pharmacy' <https://amrpharmacy.org/exhibition/>
- The Rwanda project 'Beat Bad Microbes' was recognised with an Antibiotic Guardian commended award in 2019.
- Beat Bad Microbes has been shared via the Facebook Women in Pharmacy group (over 6500 members worldwide), and a related LinkedIn post had over 1000 views, leading to networking and engagement opportunities.

3. References to the research

The research is at least 2* quality. All the papers have been double-blind, peer-reviewed. *Palgrave Communications* is a Springer Nature journal; this paper is Open Access. The journal *Design for Health* is a Taylor and Francis journal: this paper is Open Access. *Design for Health* is a volume in the Design for Social Responsibility Series, edited by Emanuel Tseklevs and Rachel Cooper, and was an invited chapter under the theme Design for Public Health.

1. Walker, S. (2019) Effective antimicrobial resistance communication: the role of information design. *Palgrave Communications*, 5. 24. ISSN 2055-1045 doi: <https://doi.org/10.1057/s41599-019-0231-z>
2. Walker, S., Hignett, S., Lim, R., Parkhurst, C. and Samuel, F. (2020) Explaining drug-resistant infection in community pharmacies through effective information design. *Design for Health*, 4 (1). ISSN 2473-5132 doi: <https://doi.org/10.1080/24735132.2020.1731201>
3. Walker, S. (2017) The contribution of typography and information design to health communication. In: Cooper, R. and Tseklevs, E. (eds.) *Design for health*. Routledge, pp. 92–109. ISBN 9781472457424

Grant funding

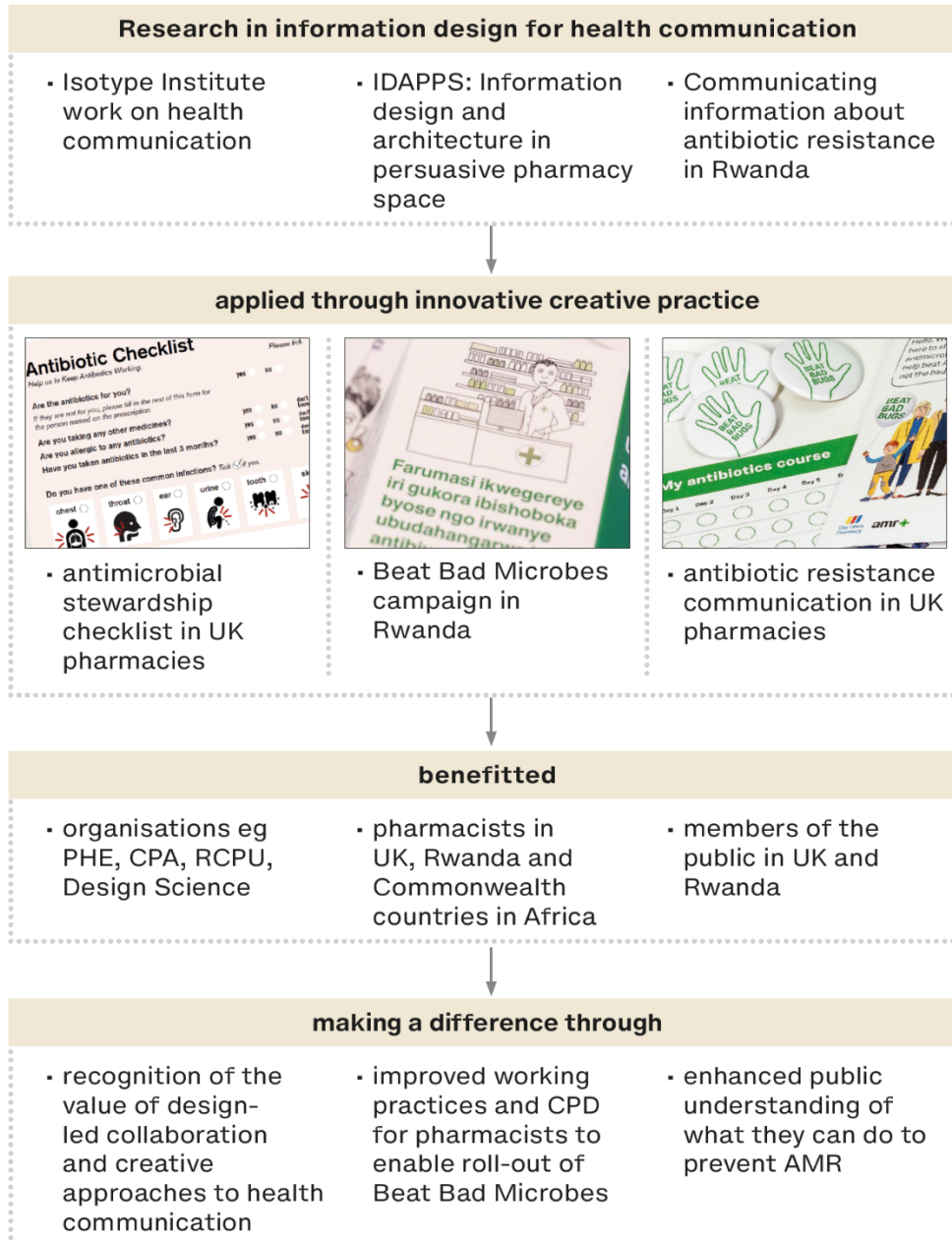
2018–19: AHRC (Grant AH/R002053/1): 'Information Design and Architecture in Persuasive Pharmacy Space: combating AMR (IDAPPS)' was one of the projects funded in the AHRC call: 'Antimicrobial Resistance in the Real World: The Indoor and Built Environment' [£195,467]

2019: University of Reading GCRF Strategic Fund, Building Equitable Partnerships: 'Beat Bad Microbes: communicating information about antibiotic resistance in Rwanda' [£48,252]

2019: £5k consultancy from Health Education England Innovation Fund for project on Antimicrobial Stewardship in community pharmacies

4. Details of the impact

The research and its application have benefitted organisations through recognition of the value of design-led collaboration and creative approaches to health communication, specifically in relation to AMR. Pharmacists in the UK and Rwanda are now equipped to provide clear advice and information on the dangers of AMR to members of the public visiting community pharmacies, who now have a better understanding of what they can do to help prevent its spread.



Impact on working practices in community pharmacies to raise awareness of AMR

The IDAPPS research project influenced a Public Health England campaign on Anti-Microbial Stewardship (AMS) in community pharmacies, including the design of an [antibiotic checklist](#) and an accompanying video to increase pharmacy staff’s capability, opportunity and motivation to provide self-care and adherence advice to people collecting prescribed antibiotics (E1). In a pilot in Gloucestershire 931 checklists were completed by patients and carers in 12 pharmacies, with feedback from 13 community pharmacists who distributed the material. Positive feedback resulted in agreed roll-out in pharmacies in Wales, Northern Ireland and four English regions, temporarily postponed due to COVID-19.

In Rwanda, the award-winning Beat Bad Microbes (BBM) materials raised awareness of AMR. The [materials](#) included an innovative antibiotic record card, co-designed with pharmacists and pharmacy users, to enable patients to hold details of their prescription and any side effects, and information about how to take antibiotics correctly. Feedback from the Rwanda Community Pharmacists' Union (RCPU) was that their involvement in BBM had raised the status of community pharmacists enabling them to provide a high-quality service and to “keep antibiotics working”. Pharmacists in Kigali, who piloted the materials, recommended their use in all pharmacies in Rwanda (E2).

This led to a national rollout of the materials in Kinyarwanda and English languages via the RCPU website, endorsed by the Rwanda Pharmacy Council for CPD, and supported by a recording of a live-streamed webinar in collaboration with the Commonwealth Pharmacy Association (August 2020), explaining how to make and use the materials (E3). The CPA, following success of BBM in Rwanda, have endorsed and [promoted](#) the BBM materials through the Commonwealth Partnership for Anti-microbial Stewardship in Africa (CwPAMS) in partnership with Antibiotic Guardian Africa (E4).

Social impact: increasing public understanding and awareness of AMR

The research in the UK and in Rwanda made a difference to people's lives by raising awareness of the dangers of AMR and how this might be addressed. As part of the co-design process for BBM, a workshop was held in Rwankuba village Rwanda to raise public awareness of antibiotic misuse: “Involving our village in this project was amazing as they learned a lot, now they are mindful that abusing antibiotics, taking antibiotics not prescribed by a recognized health professional and not completing the full course prescribed can harm their life, and they are the champions of this project” (Chief, Rwankuba village) (E5). Day Lewis pharmacy users in Reading responded positively to the IDAPPS prototypes and affirmed that their engagement was piqued by the novel ways of presenting information, and that they learnt something new about AMR, for example, the extent to which antibiotics were used in farming (E6). An infographic “Be AMR Aware” developed in the IDAPPS Ideas Lab was installed in a pharmacy in Kennington. Of 156 respondents to an evaluation survey, 77% said they learnt something new about AMR as a result of engaging with the intervention (E7).

Cultural impact: creativity and communication

The research drew attention to the Isotype Institute's approach to health communication, and its materials were used in the IDAPPS Ideas Lab to influence the design of one of the [project outcomes](#): “There is something immediately capturing and engaging about other humans and faces. It is tangible and can be related to; and we wanted to create a similar tangibility.”

IDAPPS research stimulated inter-disciplinary creativity: illustrators, interior designers, mindfulness coaches and architects worked with microbiologists, doctors and pharmacists to experiment with ways of communicating ideas about AMR. For example, knitted [microbes made in thermochromic wool](#) changed colour when held, thus demonstrating that bugs, rather than people become resistant: “we wanted to test other ways of engaging with the public through hands-on activities and presentations”. The team led by Napper Architects extended their IDAPPS work with Beyond Resistance to explore and find solutions to tackle AMR (E8).

Industry and public sector impact: cross-disciplinary collaboration

Walker's research has demonstrated the effectiveness of cross-disciplinary working to overcome the challenges of communicating the dangers of AMR and has led collaborators to develop participatory approaches in other areas of their work. Design companies involved in IDAPPS research benefitted: Design Science subsequently collaborated with a bio-medical scientist (workshop attendee) on an Innovate UK funded project in India, ‘[Milk Guard](#)’ to help treat mastitis and reduce AMR in cows and buffalo; the design studio ‘the letter g’ was employed by PHE to work on antimicrobial stewardship materials. Design-led collaboration between IDAPPS team members (bio-science and information design) stimulated a [campaign](#) at Reading for public donation and volunteer engagement in developing and providing feedback on instructional text used in home-testing kits (as part of response to COVID-19).

5. Sources to corroborate the impact

- [E1]** Feedback from pilot study of Anti-Microbial Stewardship (AMS) intervention, IDAPPS-inspired antibiotic checklist and video, feedback from pharmacy users, staff and PHE.
- [E2]** Beat Bad Microbes in Rwanda; Antibiotic Guardian Awards 2019.
- [E3]** Roll out of Beat Bad Microbes in Rwanda: endorsement from Executive Director of CPA; PDF of slide presentation of webinar 'Antibiotic resistance in Rwanda.
- [E4]** Statement from Commonwealth Pharmacy Association.
- [E5]** Email from Flandrie Habyarimana, Chief, Rwankuba Village and President of the Rwanda Community Pharmacists Union.
- [E6]** Evaluation of the AMR prototypes in Day Lewis pharmacy in Reading.
- [E7]** Report produced by CCD Design.
- [E8]** Benefit of IDAPPS involvement from members of the Napper Architects team at the Ideas Lab.