

## Impact case study (REF3)

<b>Institution:</b> London School of Hygiene & Tropical Medicine (LSHTM)		
<b>Unit of Assessment:</b> 2		
<b>Title of case study:</b> Shaping public health strategies by monitoring and building public trust in vaccines		
<b>Period when the underpinning research was undertaken:</b> 2007-2020		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b> Heidi Larson Pauline Paterson & associated research teams	<b>Role(s) (e.g. job title):</b> Associate Professor; Professor Research Fellow; Assistant Professor	<b>Period(s) employed:</b> 1/10/10-present 1/2/13-present
<b>Period when the claimed impact occurred:</b> 2013-2020		
<b>Is this case study continued from a case study submitted in 2014?</b> No		
<b>1. Summary of the impact</b> (indicative maximum 100 words)		
<p>The research conducted by LSHTM's Vaccine Confidence Project (VCP) put vaccine hesitancy on the international policy agenda as a major threat to disease control and health. Its work shaped the activities of key organisations, including the development of national strategies and the formation of mechanisms by the World Health Organization (WHO) and European Union (EU) to tackle the problem. The VCP research identified emerging issues and was used to inform trust building strategies and counter anti-vaccination discourse. Lessons and VCP expertise were applied to new outbreaks, for example to build trust in the Ebola vaccine in Africa in 2014, and to monitor public sentiment around COVID-19 vaccines and the overall COVID-19 response.</p>		
<b>2. Underpinning research</b> (indicative maximum 500 words)		
<p>LSHTM researchers pioneered the development of metrics to measure and monitor vaccine confidence, developing concepts and practical tools to study people's attitudes and emotions around vaccines. They also led the way by exploring determinants, monitoring changes, and developing guidance for vaccine clinical trials as well as routine immunisation programmes on building trust and managing risk.</p> <p>Despite the historic success of immunisation in reducing the burden of childhood illness and death, episodes of public concern and rumours around vaccines spread quickly. These can seriously damage public confidence in immunisation, leading to people refusing vaccines and to disease outbreaks. The internet has fuelled and amplified the ability of like-minded people to share their concerns about vaccination. In 2013, the World Economic Forum highlighted 'digital wildfires in a hyper-connected world' and 'the dangers of hubris on human health' as dominant global risks. Monitoring vaccine hesitancy around the world is crucial to address non- or under-vaccination and factors that affect perceptions of vaccine risks, such as safety concerns and religious beliefs and politics, which vary geographically over time and by vaccine. Building confidence in vaccines is vital to ensure that vaccination, vaccine providers, and the range of private sector and political entities involved with vaccines, serve the best health interests of the public.</p> <p>The Vaccine Confidence Project (VCP) at LSHTM, established in 2010 and led by Larson, is an innovative cross-disciplinary research initiative combining anthropology, political science, digital analytics, epidemiology, psychology and policy. The VCP and its partners (including WHO and Imperial College London) conduct research on a range of vaccines worldwide, and explores, measures and monitors public confidence in immunisation programmes by horizon scanning for early signals of public distrust and questioning. It also provides risk analysis and guidance to engage the public and pre-empt potential disruptions to programmes.</p>		

In 2014, Larson led a systematic review of global vaccine hesitancy literature published between 2007 and 2012. The review found many factors associated with vaccine hesitancy, and reinforced the view that there was no single determinant influencing hesitancy, but rather a mix of determinants which vary across time and place (3.1).

In 2015, the VCP developed and introduced the Vaccine Confidence Index (VCI) to investigate and monitor changes in vaccine sentiment over time and place to create geospatial mapping to provide guidance on where to prioritize confidence building. The VCI was modelled after the Consumer Confidence Index which measures the prevailing degree of optimism about the state of the economy. In collaboration with WIN Gallup International, the VCP developed a methodology involving a standardised set of survey questions to measure confidence in immunisation programmes as compared to confidence in other government health services, drivers of vaccine hesitancy, ultimate vaccination decisions, and how they varied based on country contexts and demographic factors (3.2). As part of the effort to map vaccine confidence globally, the team surveyed 5 countries initially in 2015 (UK, Georgia, India, Nigeria and Pakistan) (3.3). In 2016, the VCP implemented a 67-country survey, finding wide variability in vaccine confidence across world regions (3.4). In 2018, the VCP was commissioned by the European Commission to continue to monitor and assess vaccine confidence across all 28 European Union member states and among general practitioners in 10 member states (3.5) to guide their investments and interventions.

In 2020, the Vaccine Confidence Project designed and implemented a global study to track public sentiment and emotions around measures to contain, control and treat COVID-19. Through a mix of social media monitoring, population surveys and analysis over time, the study identified changing perceptions, behaviours and concerns towards the pandemic. The team collected data in real time on attitudes towards potential treatments and vaccines, with a view to supporting public engagement strategies and helping to build preparedness for potential vaccine introduction. This highlighted the need for international collaboration and knowledge exchange about the epidemic and effective control measures for individual countries, and emphasised the importance of clear government guidance and clarification of rumours to encourage science-driven engagement from the public (3.6).

### 3. References to the research (indicative maximum of six references)

**3.1 Larson HJ, Jarrett C, Eckersberger E, Smith DM, Paterson P.** 2014. Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: A systematic review of published literature, 2007–2012. *Vaccine*. 32: 2150-2159. doi: [10.1016/j.vaccine.2014.01.081](https://doi.org/10.1016/j.vaccine.2014.01.081)

**3.2 Larson HJ, Jarrett C, Schulz WS,** Chaudhuri M, Zhou Y, Dube E, Schuster M, MacDonald NE, **Wilson R,** SAGE Working Group on Vaccine Hesitancy. 2015. Measuring vaccine hesitancy: The development of a survey tool. *Vaccine*. 33(34):4165-75. doi: [10.1016/j.vaccine.2015.04.037](https://doi.org/10.1016/j.vaccine.2015.04.037)

**3.3 Larson HJ, Schulz WS,** Tucker JD, **Smith DM.** 2015. Measuring vaccine confidence: introducing a global vaccine confidence index. *PLOS Currents*. doi:[10.1371/currents.outbreaks.ce0f6177bc97332602a8e3fe7d7f7cc4](https://doi.org/10.1371/currents.outbreaks.ce0f6177bc97332602a8e3fe7d7f7cc4)

**3.4 Larson, HJ,** de Figueiredo A, Xiahong Z, **Schulz WS,** Verger P, Johnston IG, Cook, AR, Jones NS. 2016. The State of Vaccine Confidence 2016: Global insights through a 67-country survey. *EBioMedicine*. 12:295-301. doi: [10.1016/j.ebiom.2016.08.042](https://doi.org/10.1016/j.ebiom.2016.08.042)

**3.5 Larson HJ,** de Figueiredo A, **Karafillakis E,** Rawal M. 2018. A report for the European Commission that assesses the overall state of confidence in vaccines among the public in all 28 EU member states and among general practitioners (GP) in ten EU member states.

**3.6 Hou Z,** Du F, Zhou X, Jiang H, Martin S, **Larson H,** **Lin L.** 2020. Cross-country comparison of public awareness, rumours, and behavioural responses to the COVID-19 epidemic: infodemiology study. *Journal of Medical Internet Research*. 3;22(8):e21143. doi: [10.2196/21143](https://doi.org/10.2196/21143)

We believe this body of research meets the 'at least 2\*' definition given its reach, significance and rigour.

#### 4. Details of the impact (indicative maximum 750 words)

The work of LSHTM on trust and attitudes towards vaccination has helped change the way in which the world thinks about vaccines, and influenced immunisation strategies around the world, bringing crucial evidence and insights to fast-moving and challenging situations affecting public health. The need for locally adapted approaches has been repeatedly championed by the VCP, Larson, and her team.

##### **Informing international vaccination strategy**

In 2014, the World Health Organization (WHO) endorsed the definition of vaccine hesitancy proposed by the WHO Strategic Advisory Group of Experts (SAGE) Working Group on Vaccine Hesitancy, of which Larson was a member (5.1). This raised the issue as a major global health threat. The discussions were informed by Larson's global systematic review of vaccine hesitancy literature between 2007-2012. As a result, WHO SAGE recommended each country should develop a strategy to increase acceptance and demand for vaccination, including ongoing community engagement and trust-building, active hesitancy prevention, regular national assessments of concerns, and crisis response planning (5.2).

Larson was also a key participant, speaker and contributor in the 2019 Global Vaccination Summit in Brussels, co-hosted by the European Commission and the WHO (5.3), which brought together around 400 participants from around the world including political leaders, representatives from international organisations, and health ministries. The event was structured around 3 round table sessions, the first of which was 'In Vaccines We Trust: stepping up action to increase vaccine confidence' with Larson as a panel member. As a result of the summit, the European Commission and WHO published '10 Actions Towards Vaccination for All.' Number 4 pledged to 'tackle the root-causes of vaccine hesitancy, increasing confidence in vaccination, as well as designing and implementing evidence-based interventions.'

Many countries used VCP data and expertise to adapt their immunisation programmes to respond to this evolving threat. Larson and Paterson held workshops in 2019 with 41 participants from the network of countries transitioning from Global Vaccine Alliance (Gavi) support to full domestic financing of their national immunisation programmes: Armenia, Georgia, Ghana, Indonesia, Lao PDR, Moldova, Nigeria, Sao Tome and Principe, Sudan, Timor-Leste, Uzbekistan and Vietnam. LSHTM staff, in collaboration with Results for Development, Curatio, Gavi, UNICEF EURO and WHO EURO, then hosted a two-day vaccine hesitancy workshop in Geneva in November 2019, where countries developed action plans to address vaccine hesitancy challenges (5.4).

The VCP's 'State of Vaccine Confidence in the EU 2018' report was requested by the EU Commission to inform their decision making. In the same year, the EU Council adopted a recommendation to strengthen EU cooperation on vaccine-preventable diseases. A roadmap committed to a range of initiatives between 2018 and 2022 to counter online vaccine misinformation and develop evidence-based information tools and guidance to support member states (5.5). These included development of e-learning modules for primary healthcare providers to improve their skills to manage hesitant populations and promote behaviour change. An EU 'Coalition on Vaccination' in 2019 brought together European associations of healthcare workers to support delivering accurate information to the public, combating myths around vaccines and vaccination. This followed the VCP's production of a catalogue of interventions, commissioned by the European Centre for Disease Prevention and Control in 2017 to create a practical tool for organisations in the EU to address vaccine hesitancy (5.6).

##### **Drawing on expertise to promote new Ebola vaccines**

The VCP team coordinated the consortium that developed the communication strategy, tools and mobile technology to promote acceptance and uptake of new Ebola vaccines. The Ebola Vaccine Deployment, Acceptance and Compliance (EBODAC) project, led by Larson, started in 2014. It

supported vaccine trials in Sierra Leone and preparation for the future deployment of a licensed vaccine, with partners including Janssen, the College of Medicine and Allied Health Sciences, University of Sierra Leone, the Grameen Foundation and World Vision.

The EBODAC project drew on its research-based knowledge on drivers of vaccine hesitancy, and community engagement and social science expertise, to organise effective participant-driven meetings to address rumours circulating among vaccine clinical trial participants. Participant advisory groups set up in clinics administering the vaccine raised important issues. For example, the project team tackled fears around giving blood by following the local tradition of offering condensed milk to make participants feel better after giving blood. Another challenge was ensuring adherence to the two-part vaccine schedule. The team used automatic text reminders and fingerprinting/ iris scanning to make sure the same person received the second vaccination. The EBODAC project contributed to the successful vaccination of all participants in the Ebola vaccine trials (over 700), and is now used as an exemplar of how a good community engagement strategy can ensure the smooth running of clinical trials (5.7).

In 2017, this practice was shared with over 100 experts from across Africa at a symposium in Senegal organised by the EBODAC team: 'Community engagement, communications and enabling technology in Ebola clinical trials'. The symposium featuring lessons learned in the EBODAC project led to the development of an open access training tool for stakeholders in community engagement, communications and enabling technologies such as mobile training platforms and mobile biometrics for outbreak settings, which are now being adapted for COVID-19 in collaboration with WHO (5.8).

### **Influencing public discourse**

A key component of the VCP's work has been to counter false information leading to vaccine hesitancy and provide factual, evidence-based information. In 2019 alone, Larson made over 1,000 media appearances, in print, television and online. Examples with the widest reach included comments in the Guardian, Daily Mail, the Telegraph, Fox News, CNN, Associated Press, Science and BBC World (5.9). The vast reach of these media appearances is a critical element of improving vaccine confidence, when levels of trust in vaccines rely strongly on public sentiment, which can be influenced by media coverage.

During the COVID-19 pandemic from April 2020 onwards, the VCP provided social media monitoring reports in partnership with Public Health England with a focus on five preventive behaviours (hand washing, social distancing, self-isolation, wearing masks, and the COVID-19 vaccine) (5.10). This informed the UK government on public sentiment, areas of criticism, and where to reinforce campaign messages to improve public safety. Larson continually contributed to high-profile media discussion during the pandemic, including a feature in the New York Times, and comment in The Times on ways to reassure high-risk groups on the safety of a potential COVID-19 vaccine.

## **5. Sources to corroborate the impact** (indicative maximum of 10 references)

**5.1** World Health Organization. Report of the SAGE working group on vaccine hesitancy. 12 November 2014.

- lists Larson as member and cites evidence

**5.2** World Health Organization. Meeting of the Strategic Advisory Group of Experts on Immunisation, October 2014 – conclusions and recommendations. Weekly Epidemiological Record. 12 December 2014. No 50, 2014, 89, 561-576.

- SAGE Vaccine Hesitancy Working Group (Larson member, report above) report to SAGE on its deliverables pg 575. Endorsement of definition of vaccine hesitancy

**5.3** World Health Organization and European Commission. Global Vaccination Summit. Brussels, 12 September 2019.

- Larson input stated pg 4

**5.4** De Graaf K, Paterson P, Larson HJ. Supporting Learning Network for Countries in Transition (LNCT) countries in assessing and addressing their vaccine hesitancy: report of interviews with in-country stakeholders. 2019.

De Graaf K, Adamia E, Beradze N, Chikovani I. Takeaways from the LNCT Vaccine Hesitancy workshop: Geneva, Switzerland (November 18-19, 2019). LNCT Network Coordinators. Accessed at:

<https://lnct.global/blog/takeaways-from-the-lnct-vaccine-hesitancy-workshop-geneva-switzerland-november-18-19-2019/>

**5.5** EU commission vaccination overview. Accessed at:

[https://ec.europa.eu/health/vaccination/overview\\_en](https://ec.europa.eu/health/vaccination/overview_en)

- outputs resulting from the 'State of Vaccine Confidence in the EU' report, mentions the coalition, links to roadmap, council recommendation. Report listed as 'related information'
- Roadmap for the implementation of actions by the European Commission based on the commission communication and the council recommendation on strengthening cooperation against vaccine preventable diseases, accessed at: [https://ec.europa.eu/health/sites/health/files/vaccination/docs/2019-2022\\_roadmap\\_en.pdf](https://ec.europa.eu/health/sites/health/files/vaccination/docs/2019-2022_roadmap_en.pdf)

**5.6** European Centre for Disease Prevention and Control. Catalogue of interventions addressing vaccine hesitancy. Stockholm: ECDC; 2017.

**5.7** Innovative Medicines Initiative. Of vaccines, rumours, and the success of IMI's EBODAC project. 9 March 2017. Accessed at: <https://www.imi.europa.eu/projects-results/success-stories-projects/vaccines-rumours-and-success-imis-ebodac-project>

**5.8** EBODAC Consortium organises symposium on community engagement, communications and technology in Ebola clinical trials. 20-21 February 2017. EBODAC Symposium Report. Accessed at: <https://www.ebovac.org/ebodac-symposium-report/>

Smout B, Schulz W, Larson H, Willems A, McKenna P. 2018. A guidebook on Community Engagement, Communications, and Technology for Clinical Trials in Outbreak Settings.

**5.9** Heidi Larson vaccine confidence media coverage report

**5.10** Marks T, Larson HJ, Paterson P. Media monitoring report: Social media conversations and attitudes in the UK towards the coronavirus disease (COVID-19) outbreak 06 to 19 April 2020.

- Methods, funding and aims

Media monitoring reports accessed at: <https://www.vaccineconfidence.org/research-feed/social-media-conversations-and-attitudes-in-the-uk-towards-covid-19>