In Memoriam

The H in WASH: a reflection on the contribution, style and legacy of Professor Val Curtis

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ABSTRACT

In this paper we reflect on the contribution, style and legacy of Professor Val Curtis, an important, and sometimes controversial, figure in the water, sanitation and hygiene (WASH) sector who sadly passed away on October 19, 2020. Across numerous scientific articles, and several books, and operational programmes, she established herself as a world-renowned scientific expert in the field of hygiene and behaviour change, as well as a major thought-leader in the WASH sector. We identify four major scientific contributions which she made over three decades of research that spanned multiple fields, including engineering, epidemiology, and psychology. Beyond her research, she tirelessly championed hygiene as a public health priority, using her talents as a communicator to secure concrete changes in relevant policy and practice. We are confident that her example, as both a public health researcher, and as a hygiene champion, will inspire future generations of WASH researchers and practitioners to be bold and ambitious.

Key words | behaviour change, hygiene, sanitation, water

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Here, we reflect on the contribution, style and legacy of Professor Val Curtis, an important, and sometimes controversial, figure in the water, sanitation and hygiene (WASH) sector who sadly passed away on 19 October 2020. Her husband, Dr Robert Aunger, and children, Naima and Abidine Sakande, were at her side.

Professor Curtis forged her career at the London School of Hygiene & Tropical Medicine (LSHTM) which she joined as a Research Fellow in 1989, later rising to the rank of Professor. Before that, she was a practising civil engineer, first for Arup Associates and then working for different humanitarian agencies, including Oxfam. Most recently, she served as Director of the Environmental Health Group at LSHTM, a dynamic cross-disciplinary research group focused on WASH and public health. Across numerous scientific articles and several books, and indeed operational programmes, she established herself as a world-renowned scientific expert in the field of hygiene and behaviour change, as well as a major thought-leader in the WASH sector.

She wrote that, 'hygiene is a complex and confusing subject (Curtis *et al.* 2000) and she dedicated her academic life to unpacking that complexity and to bringing light where there had been darkness. With passion and curiosity, she took aim at a major public health enigma: how a seemingly cost-effective, live-saving intervention was not an investment priority. Read in retrospect, her body of work seems wilful in its design; a deliberate and bold attempt over decades to establish sufficient evidence for hygiene to be taken seriously in the water and sanitation sector, and beyond.

Earlier work had established the importance of 'water-washed' transmission of diarrhoeal diseases and the importance of having a sufficient quantity of water available in the household to practise good hygiene (White *et al.* 1972; Cairncross & Feachem 1993). What was less clear was if, and how, domestic hygiene behaviours could be effectively changed through cost-effective interventions, especially in settings where diarrhoea remained a major cause of child deaths. She picked up this baton in her doctoral work at Wageningen University in the Netherlands and carried it through to the end of her life. We see four major contributions through which her work has supported the prioritisation of hygiene within WASH research, policy and practice.

The first contribution was to use detailed mixed methods research to elucidate child and caregiver hygiene behaviours related to childhood diarrhoeal disease transmission. Based on her work in Burkina Faso, she sought to understand what drives these behaviours and proposed 'a model of the cultural, psycho-social and infrastructural proximate determinants of hygiene behaviour' that might guide better hygiene interventions (Curtis *et al.* 1995). Along the way, she strengthened how we measure hygiene behaviours in studies (Curtis *et al.* 1993) – a longstanding limitation in research in this area – and she provided practical guidance to operational agencies, including UNICEF, on how to conduct rapid formative research as a basis for locally appropriate hygiene interventions (Curtis *et al.* 1997; Curtis *et al.* 2001). And, she also demonstrated in Burkina Faso that a large-scale hygiene programme could be cost-effective (Borghi *et al.* 2002).

Second, she strengthened the evidence base for the health impact of hygiene on important infectious diseases. Two systematic reviews in particular sought to establish robust estimates for the impact of community interventions to promote handwashing with soap on two leading causes of child mortality: diarrhoea and pneumonia. The first, with Professor Sandy Cairncross, provided rigorous pooled estimates for the effect of hygiene on diarrhoeal disease (Curtis & Cairncross 2003). In retrospect, it seems strange that previous seminal reviews had overlooked hygiene, largely focusing instead on water and sanitation infrastructure. A few years later, with Dr Tamer Rabie, she led a second systematic review on the effect of handwashing on the risk of respiratory infections. Although studies were of generally low quality, they found that handwashing was associated with reduced risk of respiratory infection (Rabie & Curtis 2006). Together these two studies provided a powerful case for greater investment in hygiene – as demonstrated in her advocacy for the inclusion of hygiene in the Sustainable Development Goals (Greenland *et al.* 2013).

Third, in her quest to strengthen behaviour change interventions, she delved deeper into understanding human behaviours by drawing on evolutionary biology and ecological psychology. Initially, focusing on disgust she argued that these 'aversions can be better explained from an

evolutionary perspective as evolved aversions to potential sources of disease which pose the threat not just of mortality, but of genetic extinction' (Curtis & Biran 2001). She then assembled evidence that the human disgust emotion was an evolved response to objects posing infectious disease risks (Curtis *et al.* 2004). Based on the inference that the human brain evolved to provide adaptive behavioural responses to rapidly changing or complex environmental conditions, she co-developed the Evo-Eco approach to behaviour change with her husband, and colleague, Dr Aunger (Aunger & Curtis 2014).

Underlying her work on the emotion of disgust and the development of the Evo-Eco approach was a practical question: why do behaviour change interventions so often fail, and how can we improve them? Her answer, at root, was that traditional behaviour change interventions appealed to reason whereas emotion and our environment is what drives behaviour. Knowing that her primary audience was not evolutionary biologists or psychologists but public health professionals she again sought practical proof-of-concept. Using her training in epidemiology, she led a rigorous cluster-randomised controlled trial to demonstrate that a scalable intervention based on emotional drivers – and not transfer of knowledge – could successfully change behaviour. The results of the Super Amma trial, conducted in Andhra Pradesh, India, provided this proof-of-concept (Biran *et al.* 2009).

The fourth and final contribution we highlight is the culmination of her work: the co-creation of a general framework for behaviour change programming, known as Behaviour Centred Design (Aunger & Curtis 2016). Together with Dr Aunger, she joined the different strands together: her insights into domestic hygiene practices, and the public health programmes that sought to change these, her understanding of the epidemiological basis for these interventions, evolutionary and environmental psychology, as well as best marketing practice. This approach has since been used by researchers, policymakers, and practitioners across the world not just for hygiene interventions but also for sanitation (Tidwell *et al.* 2019; Schmidt *et al.* 2020) and beyond WASH in the broader child and maternal health and nutrition sectors (Greenland *et al.* 2016; White *et al.* 2016).

Professor Curtis was more than a researcher though. She was a powerful communicator who often saw public health struggles in political terms. She knew that good science alone was rarely enough to persuade decision-makers and she actively entered the fray. The British Medical Journal named her 'Health Communicator of the Year' in 2009 but throughout her career she had a reputation as a compelling speaker, someone who could force her audience to sit up and engage with her arguments. Not everyone agreed with her all of the time but no one could deny her effectiveness as a public health champion. It is easy to sit on the sidelines as an academic, it is another level of contribution to enter the political and policy fray armed with your research and demand change.

Nowhere were her skills as a communicator more evident though than in her teaching. She was a forceful teacher who demanded the intellectual engagement of students and pushed them to think critically about public health in general and WASH interventions and strategies in particular. Today, her former students can be found in most corners of the WASH sector; in universities and other research organisations but also in operational agencies, in governments and in the private sector. Her influence as a teacher will continue on in the work and achievements of her students.

Her efforts yielded many concrete changes in WASH policy and practice, from co-founding the Global Handwashing Partnership, to helping to establish Global Handwashing Day, to fighting for the inclusion of hygiene in Sustainable Development Goal 6. In recent years, she threw her energy into supporting national government efforts, notably the Swachh Bharat Mission in India, relishing the opportunity to work with colleagues in government to realise ambitious policy goals (Curtis 2019). She seemed undaunted by the world; whereas others would retreat in the face of seemingly intractable problems, she actively sought these out and threw herself completely into addressing them. Most recently, she was invited to join the Independent Scientific Pandemic Insights Group on Behaviours (SPI-B) to support the UK government's response to COVID-19. She again rose to the challenge, even joining meetings from her hospital bed after major surgery. At the same time, and looking beyond the UK, she published a 'strategic blueprint' to help governments around the world to design effective communication strategies to combat COVID-19 (Curtis *et al.* 2020).

Professor Curtis set out to understand hygiene and to convince the WASH sector that basic hygiene behaviours

were a critical component of global health efforts, and to provide the practical tools to policymakers and practitioners to enable action. It was an ambitious project but one which she ultimately realised. It is our view that, without her work, and the courage and conviction which underpinned it, there might be no H in WASH today. Her legacy will be felt for decades to come; by those who know her work but also by countless others who may not know her name but who will nonetheless benefit from WASH programmes that work better because they are informed by her work. We are confident that her example, as both a public health researcher and hygiene champion, will inspire future generations of WASH researchers to be bold and ambitious.

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