



Mapping the evidence on WASH promotion in communities, schools and health facilities

Water, sanitation and hygiene (WASH) are fundamental human rights that underpin survival, dignity, productivity, reproductive health and happiness. According to a 2017 report by the World Health Organization and UNICEF Joint Monitoring Programme, 3 in 10 people worldwide (2.1 billion) lack access to safe, readily available water at home, and more than 6 in 10 (4.5 billion) lack safely managed sanitation.¹

The Sustainable Development Goals – as well as other major policy initiatives, such as the *Swachh Bharat Abhiyan* (Clean India Mission) in India – go further than the Millennium Development Goals with a call for ending open defecation, which is still practised by more than 900 million people globally. The Sustainable Development Goals also set the target of universal access to WASH facilities by 2030.

¹ WHO/UNICEF JMP, 2017. *Progress on drinking water, sanitation and hygiene – 2017 update and SDG baselines.*

Highlights

- The number of rigorous studies on WASH promotion in households, schools and communities has increased substantially.
- Very few rigorous studies exist on WASH promotion in medical facilities.
- Many new studies evaluate previously under-researched approaches, such as community-led total sanitation, and measure important sector outcomes, including school attendance and reducing open defecation.
- More studies are needed to measure programme effects on the sustained use of technologies and slippage back to open defecation.
- A critical need exists for studies on promotional approaches for vulnerable populations, especially people living with disabilities, for whom no studies are available.
- New, high-quality systematic reviews are available, including ones on the effectiveness of hygiene and sanitation behavioural approaches and menstrual hygiene management.
- Synthesis gaps remain for high-quality reviews on WASH interventions in schools and on decentralised delivery.

Improved WASH services can lead to a wide range of health, social and economic outcomes. Poor WASH conditions contribute to high rates of diarrhoeal disease and acute respiratory and parasitic worm infections. Chronic high infection rates are a leading cause of undernutrition and death in children in developing countries; UNICEF estimates that diarrhoea alone kills 480,000 children each year.² Beyond the serious health

consequences, poor conditions can also diminish educational attainment and cause danger and stress for vulnerable populations, especially women and girls.

To help achieve universal targets and reach the most disadvantaged populations, decision-makers need access to high-quality evidence on what works in WASH promotion in different contexts and for different groups of people.

3ie's sector-wide WASH evidence gap map provides an assessment of the evidence base for behaviour change, health and socio-economic outcomes resulting from WASH promotional approaches in households, schools, health facilities and communities. This brief articulates the primary and synthesised evidence available in the map and what evidence is needed across different low- and middle-income countries (L&MICs) and regions.

Sustainable Development Goal for water and sanitation

Sustainable Development Goal 6 aims to 'ensure the availability and sustainable management of water and sanitation for all' and includes these goals:

- End open defecation, ensuring everyone has access to at least a basic toilet and a safe waste disposal system;
- Provide universal access to safe and affordable drinking water;
- Pay attention to the specific needs of women and vulnerable populations; and
- Expand international cooperation and strengthen the capacity of local and national bodies to manage their water and sanitation systems.

Main findings

WASH interventions have two important components – the 'what' and the 'how'. The what describes the technology, service or practice the participants end up with (for example, a latrine), and the how describes the mechanism or promotional approach of the intervention (for example, whether you give a toilet directly to a household or use a subsidy to help them buy one for themselves, see Figure 1). Before the early 2000s, the focus of the conversation was on what works, but in the last 15 years it has increasingly switched from not only what technology to provide but also the best way to do so in order to have high uptake and sustained use. Given this changing focus, the evidence gap map presents intervention mechanisms

against outcomes. There is then a filter for the technology, which allows easy comparison of the evidence for providing, for example, latrines via these different channels.

Impact evaluations

In the last 10 years, there has been huge growth in the number of impact evaluations being conducted. There are at least 367 completed or ongoing rigorous impact evaluations in L&MICs – nearly three quarters conducted since 2008. Although studies are spread over 87 countries around the globe, there is a high concentration of work in Bangladesh, India and Kenya, each with more than 40 studies (see Figure 2).

Research has shifted to cover a broader set of mechanisms. This reflects the change of focus to how a technology is provided. In particular, there has been an increased focus on behaviour change communication that uses psychosocial 'triggering' and a shift away from simply providing a good (see Figure 3). In sanitation, this is most commonly community-led total sanitation, which aims to increase the use of latrines by leveraging social cohesion to make collective behavioural changes, but also can include information campaigns focused on disgust or being a good parent, as opposed to factual information.

² UNICEF, 2018. *Diarrhoeal disease – current status and progress*.

Figure 1: WASH promotional approaches

<p>Direct hardware provision</p> 	<p>All interventions for which the required infrastructure is provided by an external authority. This includes, for example, boreholes, piped water systems, water filters, soap, handwashing stations, latrines and public sewer connections.</p>
<p>Behaviour change communication</p> 	<p>All informational campaigns including health messaging – an educational approach to increase participants’ knowledge or skills – and psychosocial approaches, which use social or emotional motivators and pressures to change behaviour.</p>
<p>Systems-based approaches</p> 	<p>Approaches that try to change people’s behaviour and how hardware is accessed by changing the wider system around them. This includes subsidies; microfinance; and working with the suppliers of a service, such as improving current providers’ performance and decentralisation.</p>
<p>Behaviour change communication combined with other promotional approaches</p> 	<p>Interventions for which direct hardware provision or systems-based approaches are combined with a behaviour change communication campaign. An example is community-led total sanitation with marketing to sanitation providers.</p>

Figure 2: WASH evidence in L&MICs

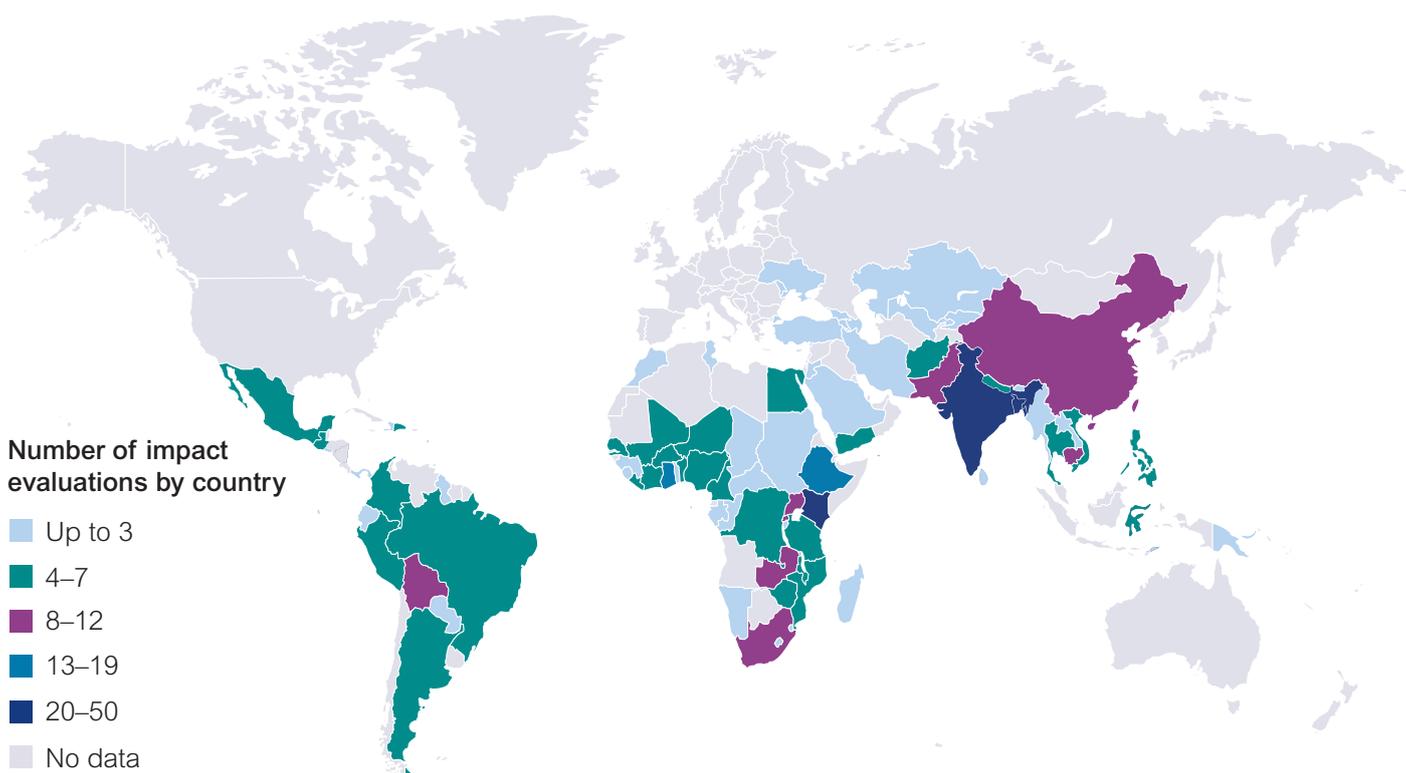
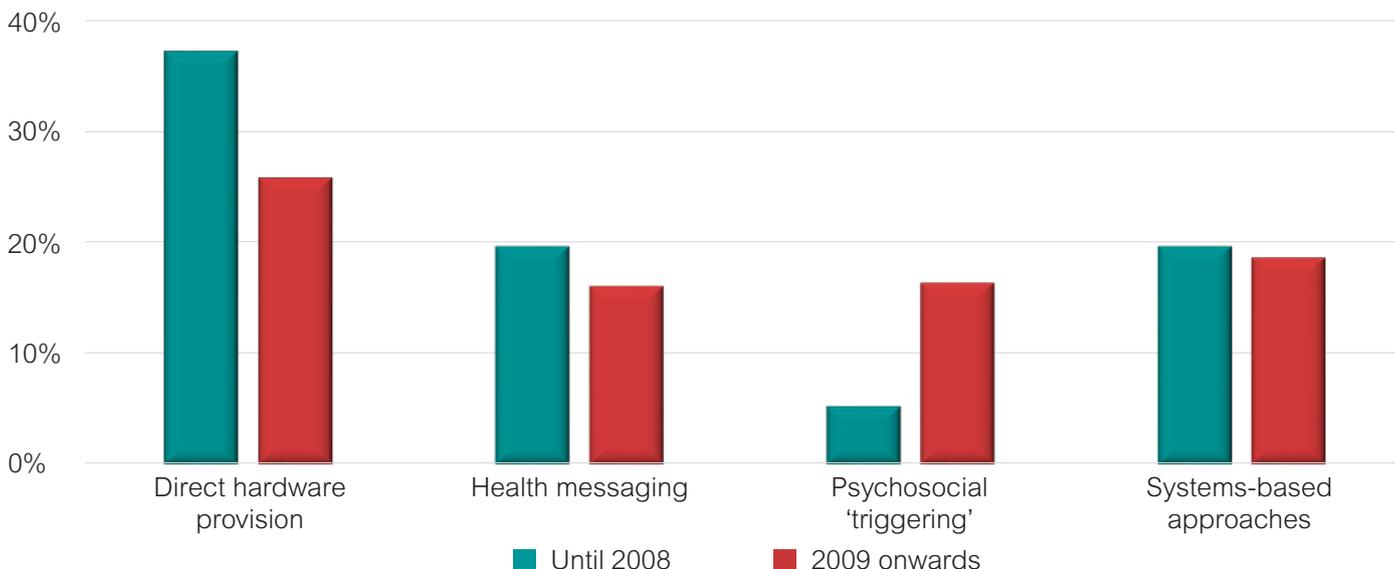


Figure 3: Change in intervention mechanisms studied since 2008



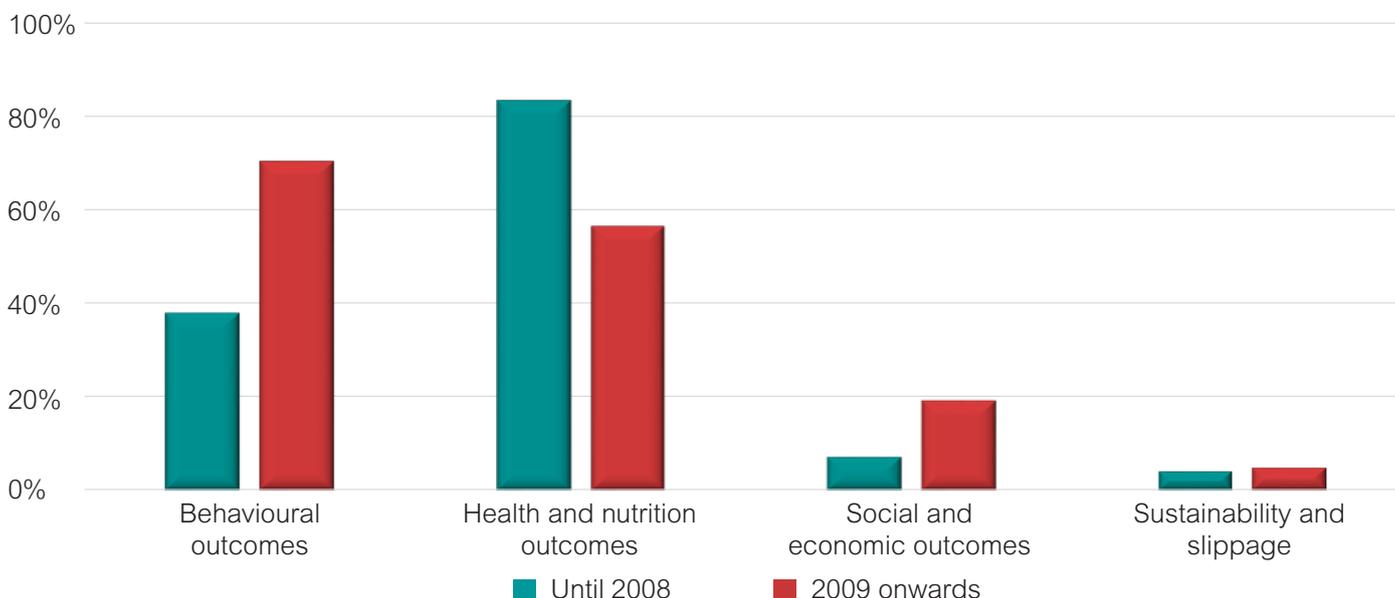
There has been a large increase in the number of studies on sanitation technologies, particularly latrines. This followed the United Nations International Year of Sanitation in 2008, which brought attention to the importance of sanitation technologies, an area previously considered too difficult or costly for applying rigorous impact evaluations. Until 2008, only 6 studies had been conducted on promoting or providing latrines, but now there are more than 50.

Behavioural outcomes, such as whether individuals are actually washing their hands or using a water filter or latrine, are now being reported by the majority of studies (see Figure 4). It is important that studies measure

improved behaviours as accurately as possible. The principal argument used by proponents of alternative delivery mechanisms is that they are more effective at changing these behaviours and therefore more effective at improving lives. There has also been an increase in social and economic outcomes, such as school attendance and labour market outcomes. Having said this, by far the most commonly reported outcome is still carer-reported diarrhoea amongst children, sometimes alongside more objective, observed measures of disease incidence. Research in the sector also underutilises recent advances, such as list experiments and vignettes, which aim to elicit views from participants on topics that are difficult to measure.

Despite the importance of sustained use and the need to prevent slippage back to open defecation, only 18 studies examine whether the interventions promoted these outcomes. Sustainability of behaviours (defined here as being measured 12 or more months after implementation) is most commonly measured for handwashing practices, rather than latrine use and sustained open defecation-free status. More generally, although there are some innovations towards more rigorous outcome measurement based on objective tests, most studies measuring behaviour change do so through self-reporting, which is considered less reliable.

Figure 4: Changes in the percentage of studies reporting outcomes over time



Some new studies evaluate interventions and outcomes that disproportionately affect women and girls, but more studies evaluating interventions in more contexts are needed.

Women and girls carry most of the burden of water collection – including time, calories spent, musculoskeletal injuries, and risk of assault or attack – and have to use unsafe places to defecate, where water and sanitation services are not accessible. They also experience particular hardships where inadequate services constrain menstrual hygiene management. Studies measuring time use (22 studies), psychosocial health outcomes (7 studies), and safety and vulnerability (4 studies) have been available since 2008, but there are still very few studies examining pain and musculoskeletal disorders due to water collection (1 study) and menstrual hygiene management (5 studies). And there are no studies of sanitation for non-binary or transgender individuals.

More generally, gender analysis is rarely used as part of the framework for understanding gendered programme effects. This is due, in part, to a lack of sex-disaggregation in the reporting. Only a minority of studies

included in the map (19% of impact evaluations and 20% of systematic reviews) report any sex-disaggregated outcomes. In impact evaluations, some of the most commonly sex-disaggregated outcomes are psychosocial health, education and cognitive development, open defecation, and time use. Most studies are not taking sex or gendered determinants into account or targeting women's specific needs.

The evidence base on the impact of WASH interventions on vulnerable populations is sparse. There are no rigorous studies examining WASH promotional approaches that target people living with disabilities or the success of standard WASH interventions in improving outcomes for them. There are also very few studies that look at the needs of people living with HIV or people living in refugee camps (see Figure 5).

In terms of place of use, the vast majority of studies look at providing technologies for use at home or by the general community. There has also been a large increase in the number of studies looking at the impact of providing WASH hardware in schools, with at least 39 rigorous studies on the topic.

The authors found only one rigorous study of WASH improvements for use in a

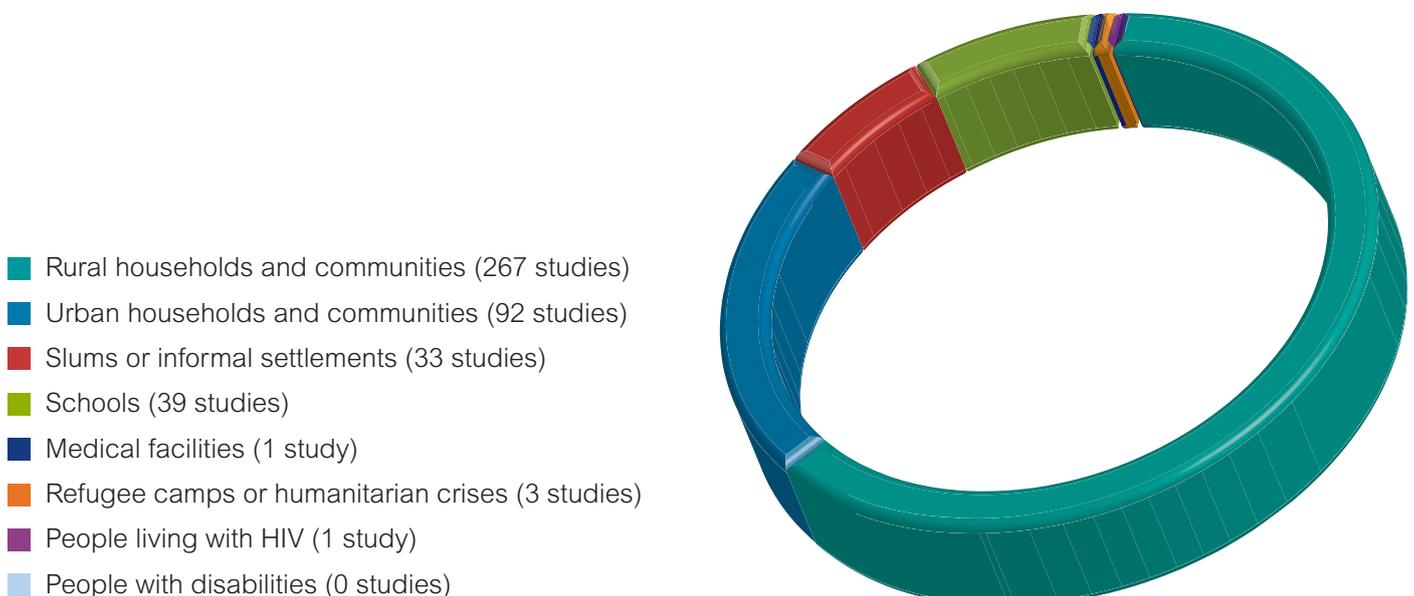
health facility, despite its importance for reproductive health and infection control.

The World Health Organization estimates that nearly 40 per cent of facilities in L&MICs lack handwashing facilities and 20 per cent lack basic sanitation; research on what mechanisms are the most effective in this context is a key to improving health outcomes and could have secondary effects on practices at home.

The majority of rigorous studies that examine effectiveness are randomised controlled trials. However, more opportunities exist to conduct rigorous evaluations of existing data on natural experiments. This approach is used when the rollout of a programme was not controlled by the investigator, but the process governing who received the intervention created comparable control and intervention groups. It is underused in the WASH sector and could prove to be a very cost-effective approach for future research.

A great number of studies continue to be conducted without a control group, simply measuring outcomes before and after; these are not usually able to attribute changes to the intervention.

Figure 5: Populations targeted by interventions studied



Systematic reviews

There are 42 completed systematic reviews and 1 protocol that summarise the findings of the impact evaluations for policymakers, programme managers, researchers and practitioners. Many of these are of high quality (12 systematic reviews) and cover a breadth of technologies, mechanisms and outcomes. A recent review of hygiene and sanitation behavioural approaches found that involving the community in different stages of programme design and implementation was particularly effective, whereas health promotion was ineffective in changing

behaviour. Another review confirmed the limited extent to which implementers were engaging with different technological needs across the human life cycle.

Evidence from medium- and high-quality systematic reviews indicates that introducing piped water supplies, point-of-use water treatment systems with safe storage containers, and handwashing with soap could be particularly effective at improving health outcomes. Community-led total sanitation also seems to reduce open defecation, at least in the short term, but the evidence does not corroborate the widespread claims of

ending open defecation found in village case studies. Finally, the evidence suggests that community-based approaches and social marketing are particularly effective in promoting sanitation behaviour change, whilst participatory communication works well in handwashing promotion.

However, there are still many gaps with significant bodies of evidence in need of synthesising. For instance, there are no high-quality systematic reviews on WASH in schools, water use and treatment behavioural outcomes, community-driven approaches, and subsidies.



© Jim Holmes / AusAID

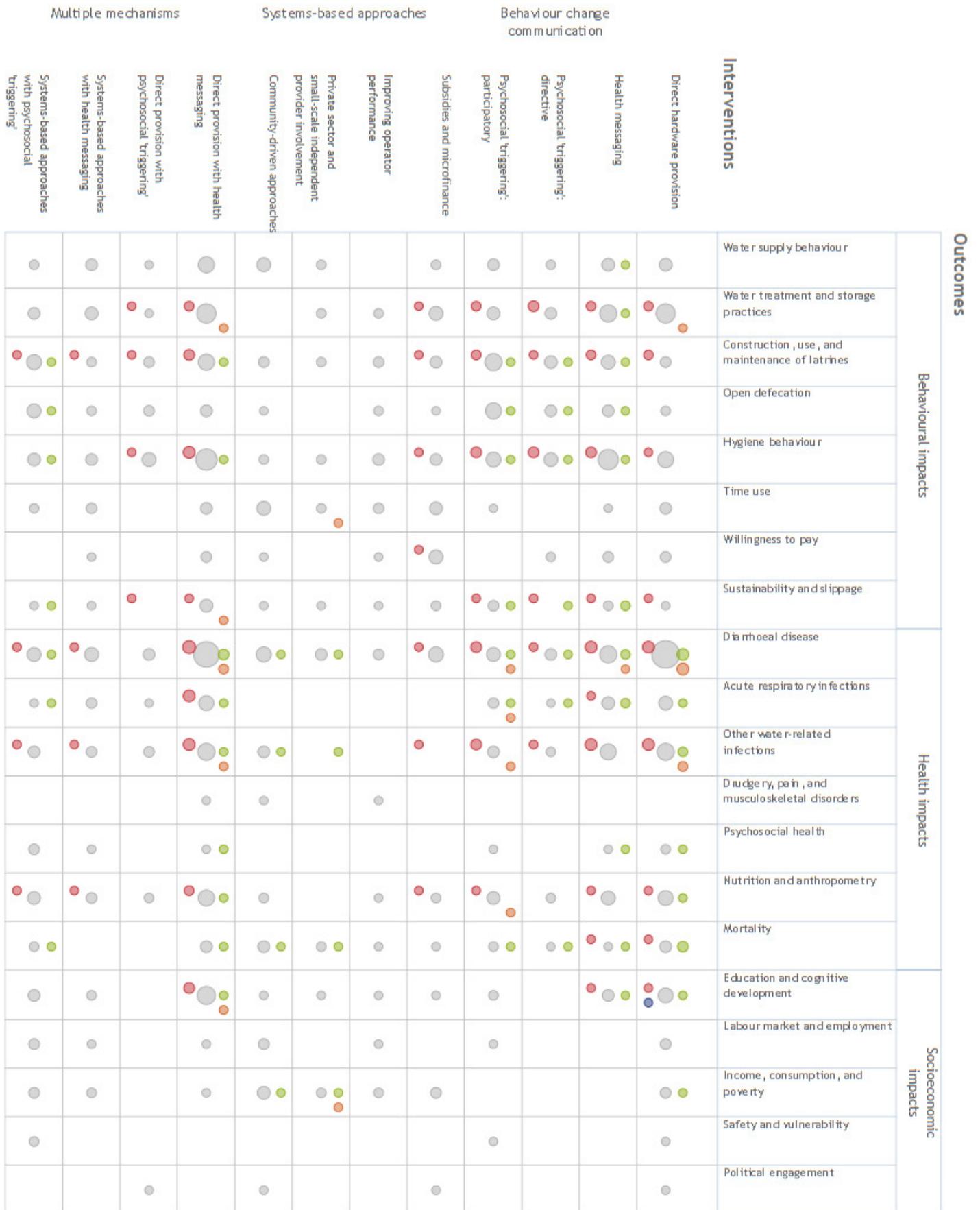
How to read an evidence gap map

3ie presents evidence gap maps using an interactive online platform that allows users to explore the evidence base of included studies and reviews. Bubbles appearing at intersections between interventions and outcomes denote the existence of at least one study or review. The

larger the bubble, the greater the volume of evidence in that cell. The colour of each bubble represents the type of evidence and, for a systematic review, a confidence rating (as indicated in the legend). In the online version, hovering over a bubble displays a list of the

evidence for that cell. The hyperlinks for these studies lead to user-friendly summaries in the 3ie evidence database. Users can filter the evidence by type, confidence rating (for systematic reviews), region, country, study design and population.

WASH Evidence Gap Map



Conclusions

Ensuring everyone has access to appropriate WASH facilities is one of the most fundamental challenges in international development. Rigorous evaluations of WASH programmes have been conducted since at least the 1970s, but the last decade has seen a revolution in the research being conducted in the sector, with an increasing focus on sanitation and hygiene behaviour change.

Researchers and funders need to consider carefully where there is the need for new primary evidence, such as impact evaluations, and for new evidence syntheses, such as systematic reviews. This evidence gap map suggests these priorities for future research:

- Understudied outcomes (such as sustainability and slippage, time use, musculoskeletal disorders, psychosocial health, safety and vulnerability) and final outcomes (such as education, income and poverty);
- Alternative mechanisms (such as community-led total sanitation or community-driven approaches), which could provide better incentives for communities to adopt beneficial practices, and the extent to which they should be implemented alongside systems-based approaches (such as microfinance) in certain contexts;
- Collecting data on objective measures of gendered behaviour change, health and socio-economic outcomes, whenever possible;
- Sex and age disaggregation and explicitly employing gender analysis to better understand not only differential outcomes, but also the role of gendered norms and discriminatory social and structural barriers facing vulnerable populations that need to be addressed during intervention design; and
- Synthesising the evidence in areas with sufficient impact evaluations, such as WASH in schools and water use and treatment behavioural outcomes, using mixed methods approaches to provide evidence on effectiveness and implementation.

What is a 3ie evidence gap map?

3ie evidence gap maps are collections of evidence from impact evaluations and systematic reviews for a given sector or policy issue, organised according to the types of programmes evaluated and outcomes measured. They include an

interactive, online visualisation of the evidence base, displayed in a framework of relevant interventions and outcomes. They highlight where there are sufficient impact evaluations to support systematic reviews and where more studies are

needed. Maps help decision-makers target their resources to fill these important evidence gaps and avoid duplication. They also facilitate evidence-informed decision-making by making existing research more accessible.

About this brief

This brief is based on the [Water, sanitation and hygiene \(WASH\) evidence gap map: 2018 update](#) by Hugh Waddington, Hannah Chirgwin, Duae Zehra, John Eyers and Sandy Cairncross. The 2018 update was funded by the Water Supply and Sanitation Collaborative Council. The authors systematically searched for published and unpublished studies since the original 2014 WASH

evidence gap map was produced and conducted new searches of behavioural outcomes and WASH provision in health facilities. The 2018 update includes 234 additional studies in L&MICs; overall, 320 are controlled impact evaluations, 42 are systematic reviews, 47 are impact evaluation trial registries and 1 is a systematic review protocol. The authors used machine learning to improve the

efficiency of the screening, enabling savings of 90 per cent in the number of studies screened.

Suggested citation: 3ie, 2018. *Mapping the evidence on WASH promotion in communities, schools and health facilities*, 3ie Evidence Gap Map Brief 10, New Delhi: International Initiative for Impact Evaluation. Available at: doi: <https://doi.org/10.23846/B/EGM/201810>



The International Initiative for Impact Evaluation (3ie) promotes evidence-informed, equitable, inclusive and sustainable development. We support the generation and effective use of high-quality evidence to inform decision-making and improve the lives of people living in poverty in L&MICs. We provide guidance and support to produce, synthesise and quality assure evidence of what works, for whom, how, why and at what cost.



For more information on 3ie's evidence gap map, contact info@3ieimpact.org or visit our website.

3ieimpact.org

[@3ieNews](https://twitter.com/3ieNews) [/3ieimpact](https://www.facebook.com/3ieimpact) [/3ievideos](https://www.youtube.com/channel/UC3ievideos)

[international-initiative-for-impact-evaluation](https://www.linkedin.com/company/international-initiative-for-impact-evaluation)

August 2018