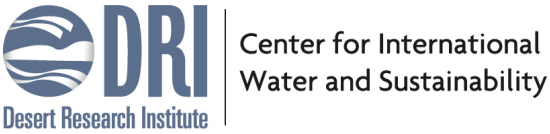

WATER, SANITATION, AND HYGIENE IN HEALTH CARE FACILITIES

The global landscape of sustainability

July 2019

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Introduction

The World Health Organization and UNICEF Joint Monitoring Programme (JMP) recently released *WASH in Health Care Facilities - Global Baseline Report 2019*, a global assessment presenting the stark inadequacy of water, sanitation, and hygiene (WASH) services in health care facilities (HCFs). Using data from over 560,000 facilities across 125 countries, the report shows that as of 2016, there were large gaps across water, sanitation, hygiene and waste management services throughout low- and middle-income countries, supporting the UN Secretary-General's 2018 call to action for prioritizing work on WASH in health care facilities. Achieving WASH coverage across all HCFs is crucial for reaching Sustainable Development Goals (SDGs) 3, of ensuring healthy lives and promoting well-being at all ages, and 6, of ensuring availability and sustainable management of water and sanitation for all. It has become clear that WASH coverage has implications for health outcomes, via patients' health-seeking behavior, as well as health care delivery itself at the facility. Thus, the gaps found in the JMP report are alarming, and highlight the need to act immediately to ensure that HCFs in low-resource settings obtain the WASH coverage that they desperately need. While various organizations have been making efforts over the past decade to achieve SDG 6, the JMP report shows that there is still much work to be done.

This project has been undertaken with the following goals:

1. Review current literature (academic and grey) to understand what has been learned by others about WASH in HCFs and how best to increase sustainability;
2. Work with the northern Malawi Transform team to provide a baseline regarding services and conditions of all HCFs in Rumphi District, Malawi;
3. Develop a Monitoring, Evaluation, Resolution, and Learning (MERL) tool that can be applied to increase sustainability of WASH services in HCFs;
4. Test the tool and evaluate its usefulness.

This landscape document addresses item 1 above. It identifies factors that are associated with gaps in coverage, assesses the various tools, programs, and frameworks that have been implemented to address the gaps, and identifies what must be addressed on an ongoing basis to ensure that WASH service at HCFs is sustained over the long term. In Part 1 of this report, we discuss the gaps in coverage highlighted by the JMP, the implications of these on public health, and the need for sustainability of WASH in HCFs. In Part 2, we review case studies and discuss factors that influence the failures and success of sustained WASH service provision, both within and outside the context of HCFs. In Part 3, we discuss how to measure success and sustainability of WASH in HCFs, as well as methods for overcoming the previously identified challenges to sustaining service.

Many of the challenges in sustaining WASH services at HCFs are similar to those found across WASH service provision in low-resource settings, whether they are communities or schools. Yet there are challenges and opportunities unique to HCFs, and many valuable lessons to be learned from the health sector at large that can be applied to WASH service sustainability. It is evident that there is a need to incorporate WASH operation and maintenance tasks from various levels into a broader, facility-wide Quality Improvement framework, supported by local government or regional institutions.

In June 2019, numerous stakeholders gathered in Washington, D.C. to solidify their commitments to achieving universal WASH coverage in HCFs. Transform International and the Desert Research Institute have jointly committed to work towards developing a framework for sustainability within this field. This landscape report is the first step toward that goal. Following this landscape, in collaboration with our partners in the field, TI and DRI will design a framework to address these gaps, and implement a pilot project to test the framework.

Part 1: Background

Global coverage of WASH in HCFs

The WHO/UNICEF JMP's 2019 global assessment presents the large gaps in coverage across five WASH domains in HCFs: water, sanitation, hygiene, waste management, and environmental cleaning. Each is graded on a ladder, having basic, limited, or no service; definitions for each level of service vary depending on the WASH service category.

Water	Sanitation	Hand hygiene	Health care waste	Environmental cleaning
Advanced service To be defined at national level	**Advanced service** To be defined at national level	**Advanced service** To be defined at national level	**Advanced service** To be defined at national level	**Advanced service** To be defined at national level
Basic service Water is available from an improved source[16] located on premises.	**Basic service** Improved sanitation facilities[18] are usable with at least one toilet dedicated for staff, at least one sex-separated toilet with menstrual hygiene facilities, and at least one toilet accessible for people with limited mobility.	**Basic service** Functional hand hygiene facilities (with water and soap and/or alcohol-based hand rub) are available at points of care, and within 5 meters of toilets.	**Basic service** Waste is safely segregated into at least three bins and sharps and infectious waste are treated and disposed of safely.	**Basic service** Basic protocols for cleaning available, and staff with cleaning responsibilities have all received training.
Limited service An improved water source is within 500 meters of the facility, but not all requirements for basic service are met.	**Limited service** At least one improved sanitation facility, but not all requirements for basic service are met.	**Limited service** Functional hand hygiene facilities are available at either points of care or toilets, but not both.	**Limited service** There is limited separation and/ or treatment and disposal of sharps and infectious waste, but not all requirements for basic service are met.	**Limited service** There are cleaning protocols, or at least some staff have received training on cleaning.
No service Water is taken from unprotected dug wells or springs, or surface water sources; or an improved source that is more than 500 m from the facility; or the facility has no water source.	**No service** Toilet facilities are unimproved (pit latrines without a slab or platform, hanging latrines and bucket latrines), or there are no toilets or latrines at the facility.	**No service** No functional hand hygiene facilities are available at either points of care or toilets.	**No service** There are no separate bins for sharps or infectious waste, and sharps and/or infectious waste are not treated/disposed of.	**No service** No cleaning protocols are available, and no staff have received training on cleaning.

Figure 1. JMP service ladders for monitoring WASH in HCF in the SDGs (*Core questions and indicators for monitoring WASH in health care facilities in the Sustainable Development Goals*, 2018)

For the purposes of this report, and in the WHO report, HCFs "encompass all formally-recognized facilities that provide health care, including primary (health posts and clinics), secondary, and tertiary (district or national hospitals), public and private (including faith-run), and temporary structures designed for emergency contexts."

The report shows that in 2016, a significant global proportion of HCFs completely lack or have only limited water, sanitation, and hygiene services. In particular:

- 74% of HCFs had basic water service, indicating that the remaining 26% had limited or no service. Among the least developed countries, only 55% had basic water service.
- 21% of HCFs had unimproved toilets or no toilets at all.
- 16% of HCFs had no hygiene service. They lacked hand hygiene facilities at points of care, and soap and water at toilets.
- 40% of HCFs lacked systems for segregating waste.
- Data on environmental cleaning was insufficient; only 4 counties had sufficient data to estimate their coverage – highlighting the need to improve global monitoring on this domain.

Further, the report shows that beyond a simple "presence/absence" assessment of WASH services, functionality poses a problem as well. In facilities where an improved water supply is available, there may be service disruptions, rendering their service level "limited"; where improved sanitation is available, latrines may not be usable due to uncleanliness; handwashing stations may lack water, soap, or even be so poorly located as to inhibit usage. In some countries, hand hygiene is promoted, but handwashing facilities are not available. Detailed statistics on service levels and conditions can be found in the report, which makes it evident that WASH services are lacking not only in infrastructure, but also in proper usage, operation, and maintenance practices. These deficiencies pose significant barriers to the long-term sustainability of WASH at these facilities. They need to be addressed not only by fixing immediate problems, but also by implementing frameworks to ensure continual functionality.

Implications of poor WASH service

Without the proper infection prevention and control that is supported by access and proper use of clean water, sanitation facilities, proper hygiene practices, cleaning routines, and safe waste disposal, patients and health care staff are at risk for health care-acquired infection. A 2011 meta-analysis found that in developing countries, 15% of patients suffered from health care-acquired infections compared to 7.1% in Europe and 4.5% in the United States, and that surgical-site infections were among their leading cause (Allegranzi, Nejad, et al., 2011). At the same time, risk of water, food and hand-borne infection is heightened with inadequate environmental hygienic conditions and poor infrastructure. Apart from the lack of handwashing facilities and treated water, poor management of human and medical waste can cause contamination to the local water supply and cause a cycle of disease.

In addition to the obvious impact to health, inadequate WASH infrastructure can also adversely affect patient satisfaction of HCFs, thus indirectly impacting their health outcomes. Poor WASH service provision has been identified as a reason for women to choose home delivery instead of hospital delivery (Bouzid, Cumming, et al., 2018). While the data on health care-acquired infections support their case for making this choice, women in sub-Saharan Africa still have a higher chance of survival when delivering at a health facility compared to delivering outside a health facility (Doctor, Nkhana-Salimu, et al., 2018). Thus, improving WASH at HCFs will improve patient outcomes not only by preventing the spread of infections, but also by encouraging patients to seek professional care.

Approach to improving WASH services at HCFs

Many initiatives by both governments and non-governmental organizations are seeking to improve WASH coverage at health care facilities in low and middle-income countries. The WHO and UNICEF propose a target of 100% coverage of basic WASH services by 2030, which will help achieve SDGs 3 and 6.

The barriers to achieving full WASH service coverage are multi-faceted, with infrastructure only being a part of the problem. The WHO and UNICEF cite issues such as incomplete standards, inadequate monitoring, disease-specific

budgets and disempowered workforce, as well as other barriers (*Water, Sanitation, and Hygiene in Health Care Facilities: Practical steps to achieve universal access to quality care*, 2019). Even when focusing on problems of infrastructure, abundant literature shows that water systems in rural sub-Saharan Africa have a high rate of failure after implementation (Montgomery, Bartram, et al., 2009), and the 2019 JMP report itself also shows that disrepair, service disruptions, and uncleanliness often render existing infrastructure of limited value.

All of this points to a need for improvement and maintenance of existing services, in addition to the development of new infrastructure. The WHO and UNICEF, in their 2019 report, have defined the following eight practical steps at the national level:

1. Conduct situation analysis and assessment
2. Set targets and define roadmap
3. Establish national standards and regulation
4. Improve infrastructure and maintenance
5. Monitor and review data
6. Develop health workforce
7. Engage communities
8. Conduct operational research and share learning

The document also states that "[a]cross all eight practical steps…, strong institutional leadership from the Ministry of Health and good governance at all levels (national, sub-national, and facility) of the health system is required…. Overall coordination requires a high level of leadership beyond any one ministry to ensure a common, cohesive approach." In examining factors that impact sustainability, we will look at the need for coordination of high level leadership, and good governance at all levels.

What is sustainability?

Put most simply, sustainability can be defined as the ability of something to continue working over time. WaterAid's Sustainability Framework notes: "Sustainability is about whether or not WASH services and good hygiene practices continue to work and deliver benefits over time. No time limit is set on those continued services, behavior changes and outcomes. In other words, sustainability is about permanent beneficial change in WASH services and hygiene practices" (Carter, Casey, et al., 2011).

Sustainability is not a static concept, and enabling WASH systems to continue functioning over time may require evolving and adaptive delivery mechanisms (Carter, Tyrrel, et al., 1999). As such, they need to continue being monitored, evaluated, and adapted. On-going training is necessary to ensure staff retain the skills they need. A monitoring, evaluation, resolution, and learning (MERL) program, involving field staff but supported strongly by the local government or Health Department, will help maintain these processes.

Part 2: Trends in WASH service sustainability

The JMP report provides a thorough overview of the global landscape. While global data demonstrate the scale of the issue, a ground-level examination is necessary to understand what the gaps in service actually look like in practice.

A few studies conducted across HCFs in Africa highlights them.

An evaluation was conducted by Improve International of 20 HCFs in Kenya and Ethiopia that had previously received support in water and waste management from Millennium Water Alliance and other NGOs (Davis, 2018). The findings showed that across both countries, HCFs generally scored poorly on availability of soap, cleanliness of toilets, and functionality of water access points. In Kenya, consistent water access was also a problem, while in Ethiopia, facilities severely lacked incinerators as well as functional and accessible toilets. As these HCFs had received external support in the past, the inadequacies uncovered in this evaluation indicate that sustaining WASH services past the departure of such support can be a challenge.

In Rwanda, an assessment was performed across 17 rural HCFs that had piped water and a power supply in order to determine the suitability of the HCFs to receive a donation of a water treatment system (Huttinger, 2017). Despite having more advanced infrastructure than the average rural HCF, they showed significant gaps in water quality and hand hygiene. For instance, only 20 liters of water were treated each day at the HCFs, only 32% of handwashing stations had both soap and water, and only 44% of sanitation facilities were hygienic and accessible to patients.

In an assessment conducted by Emory University across 15 HCFs in Northern Malawi using the WASH Conditions (WASHCon) tool, hand hygiene and water supply were again found to have the largest gaps, with unimproved or no hygiene services available in 7 of the 15 facilities, and limited service in almost all facilities across the domains of water supply, sanitation, and waste management (Ferrey, et al). Meanwhile, a separate study conducted within the Ntcheu district of Malawi found that even though 99% of the 81 surveyed clinics had a year-round source of water, only 11% of them had water and soap for handwashing, and 42% had an improved sanitation facility (Mmanga, Holm, et al). Further, 71% of the clinics disposed of medical waste in the pit latrines instead of in a separate collection area.

These examples support the JMP global findings that there are significant gaps in WASH coverage at HCFs. Moreover, they highlight the challenge in maintaining quality WASH services even when infrastructure does exist. What factors contribute to these low rates of service? A review of lessons from the broader WASH sector, in addition to some specifically from the health sector, provides valuable insight.

Literature on the failures and successes of WASH services is abundant, and can be broken down into the hardware and software factors.

Hardware

Infrastructure must be appropriate for the context, with considerations not only for the physical design and construction, but also for the practicality of its operation and maintenance, considering the available resources such as water or energy supplies, supply chain for spare parts and any materials, and local operational skills. Further, the infrastructure must be environmentally sustainable such that natural resources are not irreversibly depleted, and the surrounding environment is not irreparably damaged.

Design and construction of infrastructure have direct implications on their use and sustainability. For example, research in South Africa has shown that suboptimal design and construction of latrines led to poor structural integrity, odors, and flies, making latrines undesirable to use (Bhagwan, Still, et al., 2008). In the context of an HCF, for health reasons alone patients should expect a clean and functional latrine, but unpleasant facilities will only further discourage use. Beyond the physical construction, all factors for operation and maintenance of the infrastructure need to be in place for continual functionality. Studies of rural water supplies in sub-Saharan Africa have found that apart from hydrogeological factors that cause eventual deterioration in hand pumps, factors preventing regular maintenance, including distance of the pump from spare parts, lack of a technician, and lack of a fee collection system were associated with pump failure (Foster, 2013; Foster, Willetts, et al., 2018).

Examples of the applications of medical technology also highlight the importance of appropriate hardware in a health care context. A review of devices for perinatal care in low-income countries shows that devices must be robust, simple to use, and have a long lifespan in order to address the challenges that facilities face, including constrained budgets, rugged environments, and shortages of staff (Wyatt, 2008), not unlike the requirements and challenges of WASH infrastructure.

However, for hardware to be sustained, robust software factors to support it are required as well.

Software

The software components to a WASH system ensure that the hardware, whether they are sinks, latrines, or waste collection pits, are sustainably used and operated. There must be financial resources to support operations, strong leadership and proper management, adequate on-site capacity and training available as needed, adequate support and motivation, and the proper attitudes and behavior among staff and users.

Financing

Finances must be in place to pay for the recurrent costs of continually operating, maintaining, and repairing WASH infrastructure. Since breakdowns are inevitable, there must be a cost recovery mechanism in place to pay for repairs; otherwise, the infrastructure will certainly fail. It is critical that adequate financial planning take place from the beginning, including determination of life cycle-costing of the WASH infrastructure and services. For example, an in-depth study of rural water supplies in Tanzania showed that financial management was highly correlated with functionality, indicating that communities without collected fees were unable to rehabilitate dysfunctional infrastructure (Haysom, 2006). Apart from costs associated with hardware, finances are needed to support capacity building efforts, training, and staff incentives. Funding is often a major challenge, and it therefore must be planned for thoroughly in advance.

In Ethiopia's Clean and Safe Health Facilities (CASH) program, which works to improve WASH services across HCFs nationwide, initial funding was provided in large part by the Ministry of Health, but subsequently health facilities have become responsible for reinvesting their own revenue into the program. This is a challenge that has been identified in the program; facilities often do not have sufficient funding to make all of the improvements they need, such as the simple replenishment of soap. A dedicated and consistent budget within the MOH for such ongoing needs would be helpful for sustaining the improvements.

In some contexts, selling water to the community may be a feasible option for generating revenue as it was in 8 out of 9 HCFs in Rwanda involved in a study assessing the performance of their water kiosks (Huttinger, 2017). This

would only be feasible in HCFs that have an adequate and reliable supply of water, and the study authors state that the profits were unlikely to be sufficient to cover future maintenance and repair costs. However, in the right context and with other sources of funding, this model could be a possible funding stream.

While there are various models for financing the health care systems, an in-depth discussion of these is outside of the scope of this project. However, as health institutions make budgeting decisions, they should keep in mind that WASH service provision is an important branch of preventative health care, and should be allocated as such.

Leadership and management

Any WASH system requires strong leadership and proper management of the system. Ethiopia's CASH Program mentioned above, launched in 2014, provides an excellent example of the effects of strong leadership specifically within the context of WASH in HCFs. CASH is a Ministry of Health initiative with extensive support from partner organizations, well known public figures, and community representatives. Recognizing the need to improve WASH within their HCFs, the program involves nation-wide staff training, implementation of an audit tool, and development of cleanliness charters. As a national program, one of CASH's strength is the fact that leadership at the highest level is invested in setting and achieving targets. Further, it has been observed that facilities that achieved the most change were those that had the most "dynamic and engaged leaders and senior management" (World Health Organization, 2017).

To further support this point, lack of strong leadership can evidently lead to poor service coverage. In India, misplaced motivations and lack of leadership capacity for the Total Sanitation Campaign led to poor and haphazard construction of latrines, preventing the achievement of the sanitation coverage that the nation hoped for (Hueso and Bell, 2013). Successful construction, on the other hand, was found in villages with strong government facilitation. Meanwhile, in their study on Malawian HCFs, Mmanga, et al, observed that the further down that WASH responsibilities were pushed, the larger gaps there were in coverage: whereas water supply was managed by the national government and reflected very high coverage, distribution of soap was managed by Health Surveillance Assistants at the field level with limited budgets, potentially explaining the low availability of soap at the observed HCFs.

Leadership and management who are motivated to improve WASH conditions can set the right priorities, allocate sufficient resources, and encourage staff behavior, thus contributing to long-term sustainability. The success of Tanzania's use of the 5S management tool to improve health services quality provides a good example. Among fifteen countries where Japan International Cooperation Agency (JICA) implemented 5S, Tanzania was the quickest to achieve their goals and extend the program beyond the pilot site, due to their establishment of policies and institutional frameworks for quality improvement prior to the start of the program (Honda, 2012). This illustrates that when leadership are invested from the beginning of the program, programs are more likely to succeed.

On-site capacity

Even with strong leadership, a system cannot work continually without adequate on-site capacity. Skills and knowledge pertaining to WASH services must be available within the community or institution managing the WASH system. As stated by WaterAid, "there is no such thing as maintenance-free technology" and as such, there must be personnel who are available and dedicated to conducting maintenance. Routine operation and maintenance provided by on-site personnel helps prevent systems from falling into disrepair and leading to a need for costly repairs. On-site capacity can also sustain user demands and appropriate WASH behavior. For instance, having dedicated personnel who ensure the functionality of handwashing stations would encourage people to continue using them, whereas the absence of such personnel leads to dysfunctionality and thus discourages sustained use.

Medical staff's capacity and willingness to comply with processes is important too. Though they may not be responsible for conducting repairs, they still play their role in maintaining hygienic environments by washing hands, disposing of waste correctly, practicing clean habits, and reporting problems that arise to the responsible party.

In Nigeria, a lack of the necessary knowledge among staff at an HCF led to their handling of waste incorrectly, exposing themselves and others to health risks (Coker, Sangodoyin, et al., 2009). While cleaning staff are often overlooked, their responsibilities have a direct impact on infection prevention and control, and therefore should be engaged with, acknowledged, and trained properly, thus building up capacity at the ground level (Cross, Gon, et al., 2019). Thus, in maintaining WASH services at HCFs, capacity must be built at every level of staff: cleaners, technicians, medical staff, and administrators, as each play a unique role in the system. Adequate capacity also impacts ongoing management, leadership, and behavior change, which are all key issues for building sustainability.

Technical and Administrative Support

Having adequate support can be the difference between success and failure, as inevitably there comes a time when a community or a facility faces issues they do not have the ability to manage, even if there is strong local capacity. HCFs often have staff on site for regular maintenance activities such as water treatment, cleaning, and waste management, but may not have the capacity to deal with more complex problems, nor plumbing or electrical repairs. Support may also be needed for guidance on management issues, such as material procurement and staff training. It can also facilitate the adherence of WASH standards, and the sharing of lessons learned between various HCFs.

While the Community-Led Total Sanitation (CLTS) approach argues against external support in favor of heightened community motivation, evidence shows that without such support, communities end up with faulty designs and are unable to maintain the infrastructure properly (Papafilippou, Templeton, et al., 2011).

Further, post-construction support (PCS) has shown to be associated with better performing water systems, with higher rates of functioning taps, cost recovery, and user satisfaction, among rural communities in Bolivia (Davis, Lukacs, et al., 2008; Kayser, Moomaw, et al., 2014). Such post-construction support systems involved the supervision by a skilled individual who was able to offer technical and administrative assistance on communities' infrastructure. Because water infrastructure can involve technical knowledge and significant financial resources to maintain, skilled and knowledgeable individuals should be available. Local technicians can provide regular oversight, but external supervisory support may be necessary for more in-depth knowledge. Also, since community enthusiasm can wane after a few years, these support agents should be responsible for follow up to ensure that systems continue to function well (Carter, Tyrrel, et al., 1999).

Within a health care context, support visits and periodic monitoring were some of the many factors attributed to the successful implementation of the 5S quality improvement model in Sri Lanka and Tanzania. In addition to visits by experts from the implementing agency JICA, periodic meetings between HCF leaders provided an opportunity for them to discuss lessons learned and ways forward. Thus, a forum of support outside of the HCF is crucial to sustainability.

Attitudes and behavior

Attitudes and behaviors of users and providers of a service underlie all of the other factors, encompassing demand for services, consistent, correct and sustained use, sense of ownership, and motivation to take action. Interactions between health care staff, patients, and families and other visitors, also present a unique opportunity to enhance

the community's understanding of the benefits of good WASH services, and hence build demand generally as well as encourage accountability on the part of the HCF to provide these services.

Demand is the "foundation for understanding and prioritizing needs" (Montgomery, Bartram, et al., 2009), without which WASH infrastructure at HCFs will fail to be operated, maintained, and used by patients, visitors, and staff. Demand by users, which comes about as a result of changes in the relevant attitudes and behaviors, is necessary for management and leadership to allocate the resources to sustain such systems. In cases where populations may be unfamiliar with why WASH services are beneficial or even necessary, training and education are essential for influencing demand, as well as for sustaining motivation to undertake relevant actions.

However, it is often the case that staff are well aware of the necessities of WASH behavior. This is illustrated in an example about hand hygiene. Handwashing compliance at health care facilities has been shown to be remarkably low at 40% (Erasmus, Daha, et al., 2010), with health care workers reporting that they comply more than the reality. While health care workers understand the importance of hand hygiene, prioritization of other tasks sometimes cause the task of hand washing to be neglected. In the evaluation of HCFs in Ethiopia and Kenya mentioned earlier, Davis also observes that WASH appears to be a low priority for staff, and this may be influencing the poor quality of WASH services more than the lack of funding. These examples show that there are important implications for infrastructure planning; by decreasing barriers towards certain tasks, such as placing handwashing facilities in more convenient locations, handwashing behavior could improve, as demonstrated through Nudge theory (Harris, 2005).

User behaviors pertaining to WASH are also highly influenced by attitudes and perception, as demonstrated in qualitative studies on latrine use. Barriers to the use of latrines include perceptions that they are far away, the presence of user fees, and a preference for defecating in the open (Obeng, Keraita, et al., 2015). While knowledge of the latrines' prevention of spreading disease was cited, reasons for using or owning a latrine among community members were overwhelmingly due to dignity, prestige, and well-being (Jenkins and Curtis, 2005).

Favorable attitudes, essentially user demand, toward any kind of WASH infrastructure can therefore have a profound effect on how it is used. Anecdotal evidence from HCFs in Malawi provides another interesting example: in the absence of colorful bins for waste separation, innovative frontline staff created hand-made labels for existing containers to designate separate streams of waste, showing that the right attitudes are key to making and sustaining positive change especially in the face of constrained resources.

The successful implementation of the 5S management model in Sri Lankan HCFs documented by Withanachchi, et al, demonstrate the importance of influencing staff behavior and attitudes as a first step to making system-wide change. The authors note that staff resisted implementing any changes initially, but upon seeing the benefits of the 5S model, feeling empowered as employees, and gaining a strong sense of team spirit, they were much more inclined to participate. The rest of the 5S model, which involves continual assessment and improvement, hinge on these crucial motivation and attitudes, and sense of ownership on the part of the staff.

Summary

Being a relatively new field of focus, WASH within the HCF context still lacks an abundance of literature about its successes and failures, particularly around sustainability. Numerous similarities between HCF and community-based WASH systems exist, and the factors influencing their sustainability are very much alike, as shown above. However, it is also important to keep in mind that unlike communities, health care facilities have a wide range of staff, have a direct effect on public health, and require some specialized infrastructure, such as health care waste management, showers, and clean water for sterilization.

The figure below, developed by USAID's Maternal and Child Survival Program, outlines the key components of sustainable WASH services in a health care facility, and captures the points raised above.

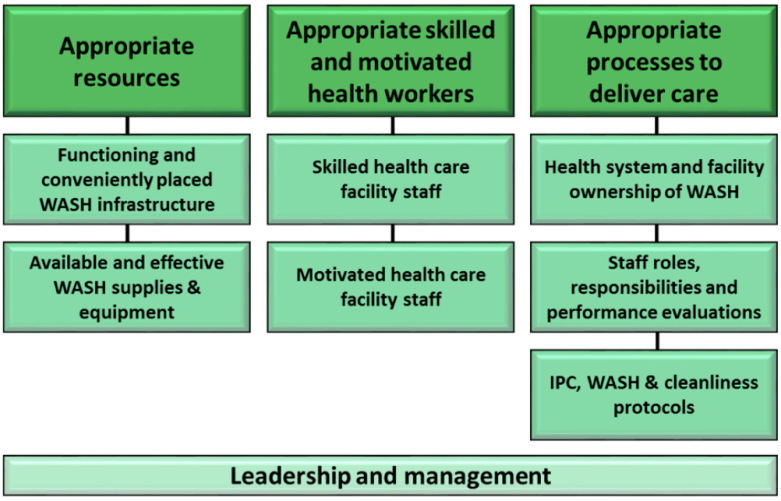

Figure 2. USAID's Maternal and Child Survival Program's framework for providing high-quality health care via WASH. (WASH in Health Care Facilities: A Toolbox for Improving Quality of Care, Accessed 2019)

Part 3: Overcoming challenges and promoting sustainability

Measuring success and sustainability

In 2018, the JMP published "Core questions and indicators for monitoring WASH in health care facilities in the Sustainable Development Goals." The global indicators are primarily used to monitor the availability of WASH services. They do not however monitor the quality, condition or use and depending on the frequency of monitoring may not provide a full picture of WASH services (i.e., availability of water during dry and rainy season). Although these are important data to collect, the indicators will not necessarily help a facility assess sustainability nor the status of factors that result in long-term sustained improvements unless it is integrated into a framework that is suitable for facility-level use. Therefore, additional tools are needed to provide ongoing monitoring data that lead to evaluation, resolution and learning (MERL). For a more thorough understanding of a particular health care facility, success can be measured through two lenses: first to assess the system's functionality, and secondly to assess its sustainability. The broad question areas, which should be answered through ongoing monitoring and evaluation, may be posed as such:

Functionality:

- Is the infrastructure adequate and well placed to meet needs, and is it functioning properly enough of the time?
- Are adequate processes in place?
- Are the infrastructure and processes used continually, correctly, and consistently?

Sustainability:

- Is there adequate leadership, clear roles and responsibilities, and supervision of processes and facilities usage?
- Is there adequate motivation and education to sustain changed behaviors?
- Is there sustained human capacity to use, operate and maintain WASH services at this facility?
- Is there sufficient funding to support WASH services at this facility?

By addressing the broad question areas above, we can determine if appropriate resources, appropriate skilled and motivated health workers, and appropriate processes to deliver care are in place.

Regarding monitoring and evaluation itself, there are still barriers to implementing sustainable practices. An evaluation of M&E in WASH in schools programs (Deroo, Walter, et al., 2015) revealed several challenges including logistics, M&E capacity, and funding. In particular, human resource capacity posed a challenge in terms of the time constraints and higher workload that M&E activities led to, as well as a lack of sufficient training by field staff to carry out M&E. The study suggests that a key to sustainability is to integrate M&E practices into government systems, thus incorporating external support into WASH services. Further incorporating the resolution and learning aspects of MERL into these processes will ensure a stronger system of WASH services, as changes are continually incorporated, adaptations made, and lessons shared.

It will not be sufficient to address the gaps individually or on a one-time basis; rather, they need to be addressed in a continuous and holistic manner keeping in mind the role that WASH plays in a larger health care delivery system. In this section, we will discuss how existing tools can be adapted to improve sustainability of WASH services in HCFs.

Existing Tools

What tools are available to assist WASH in HCF work? Do these tools address sustainability? What are the gaps?

Numerous tools have been developed to improve WASH conditions at HCFs. Summarized in the table below by Emory University, these tools are designed to conduct assessments on existing WASH facilities (WASHCon, WASH FIT, FACET), provide guidance on programming improvements (WASH FIT, Clean Clinic Approach), and facilitate training (TEACH-CLEAN). These tools have been reviewed in more depth in Appendix A. Other tools that address WASH sustainability also included in the appendix are Emory's Safe Water Sustainability Metric, Engineers Without Borders' health center water system rehabilitation manual, and school-specific O&M manuals. Programs and models are also reviewed in the apppendix: WaterAid Malawi's Deliver Life Project, USAID's Clean Clinic Approach, the Circuit Rider Methodology, and the 5S management method.

WASH in HCF Tool Comparison Chart	FACET	WASH & CLEAN	WASHCon	Clean Clinic Approach	WASH FIT	TEACH-CLEAN
Type of tool	Assessment	Assessment	Assessment	Programming	Programming	Training
Degree of developer involvement[1]	•	••	••	••	•	••
ASSESSMENT						
Facility-level assessment to inform interventions	•	•	•	•	•	•
Assessment tool for national monitoring	•	•	•		•[2]	
Inclusion of JMP indicators	•	•	•	•[3]	•	
Inclusion of additional topics (e.g., management)			•	•	•	•
Mobile platform for data collection/visualization	•		•		•	
Data to inform advocacy	•	•	•	•	•	•
PROGRAMMING						
Creation of facility WASH committee				•	•	
Progress monitoring for WASH committee		•[3]			•	•
WASH improvement planning and continuous follow-up based on minimum package/WASH standards		•		•	•	•
Competitions between facilities				•		
Behavior change training						•
Integration into district/national-level activities				•		
LANGUAGES						
	EN, FR, AR, Nepali	EN	EN, FR	EN, FR, SP	EN, FR, Khmer Russian, Lao; Forthcoming: SP, AR	EN, FR, Gujarati

[1] These tools require varying levels of involvement and support from the organizations which developed them.
[2] Data collected through WASH FIT can be used at the national level, however for more regular or larger scale data collection, FACET or WASHCon would be more suitable.
[3] CCA is a programming tool that incorporates the JMP standards by leveraging WASH FIT, WASH Clean, WASHCon, or other tools. CCA refers to JMP indicators and WHO Standards for Environmental Health and IPC.
[4] WASH & CLEAN doesn't require a facility to create a WASH committee but does include tools that can be used as part of the continuous quality improvement cycle within facilities driven by WASH and/or IPC committees.

Figure 3. WASH in HCF Tool Comparison Chart. (Denny, 2018)

Though each of these tools is effective in achieving their intended purposes of assessment, programming, or training, there still remains a gap in MERL at the facility level. Once a facility uses any of these tools (or a combination) to conduct an initial assessment and plan improvements, there are few mechanisms provided to the facility that are integrated with their existing daily operations to enable continual self-assessments on whether their improvements are on track, and once improvements have been made, whether they are sustained. While WASH FIT, for example, does outline a framework for implementing and tracking improvements, it lacks guidance on how those activities can be incorporated into day-to-day activities of HCF staff with the requirement of few resources and minor behavior changes.

Another important consideration is the requirement for human resource capacity in making and sustaining improvements. Some existing tools, such as Clean Clinic Approach, rely on an external entity returning to assess the facility and determine its achievements. Though this is a motivating factor and an important component to facilitating improvements, it is not sufficient to build local capacity to enable a continual improvement process. As demonstrated in the previous sections, support from a local administrative body should be available in conjunction with strong local capacity, so that WASH services can be routinely maintained but backed by higher levels of expertise, knowledge, or resources when needed.

A framework that centers its approach towards WASH improvement via strong support services by local government (or other entity) and building of local capacity is needed. Local capacity, at the HCF level, needs to be strengthened so that everyday staff are able to perform the routine activities that ensure smooth operation of a facility and minimizes the need for major overhauls. Relevant knowledge, skills, and attitudes must be continually improved so that positive WASH behaviors persist, enabling the necessary routine operations to take place, and reminding staff that maintaining WASH services is a shared responsibility.

While training is essential, a one-time training is insufficient to make the lasting changes that continuous training could achieve. Training plans at both the facility level and government level are crucial for ensuring that the human resources factors contributing to sustainability of WASH are maintained. Not only should health care providers, maintenance technicians, and cleaners participate in training, but also HCF managers and leaders who set the tone for how WASH services are operated. Local government administrators must also receive training, so that they are well equipped to support HCFs in issues beyond their everyday capacity, whether it is in a financial, technical, or administrative capacity, and of course, to facilitate continual training for HCFs. Effective monitoring data is also needed on a regular basis to track progress and trigger review and response.

It is important to consider that the ultimate goal of WASH services within HCFs is to provide quality health care to patients. Unlike community or school-based systems, WASH systems at HCFs do not exist only to provide water and sanitation services, but to achieve the higher goal of improving the public health of the communities they serve. Therefore, a useful tool would be incorporated into a health care delivery framework, rather than be a distinct program.

Integrating WASH improvements into the health care framework

Health systems globally are working on improving their quality of care through Quality Improvement (QI) frameworks. This is evident through the availability of a variety of WHO guidelines, including “Delivering quality health services: A global imperative for universal health coverage”, and “Handbook for national quality policy and strategy: A practical approach for developing policy and strategy to improve quality of care”. From national ministries of health, to district HCFs, Quality Assurance departments and Infection Prevention and Control committee are being established with the ultimate goal to improve public health. Within these efforts, WASH is recognized as a tenet of “accessible and well-equipped facilities” that is one of the foundations to quality care and is therefore compatible with existing QI efforts (Delivering quality health services: a global imperative for universal health coverage, 2018). Embedding WASH as such would contribute to long-term sustainability more than developing a separate, stand-alone program.

There is strong evidence on the effectiveness of QI frameworks in low-resource settings. Leatherman, et al, compiled a review of QI interventions and found that they led to improvements across the domains of emergency obstetric care, acute child illness, primary care, health systems, and prescribing practices (Leatherman, Ferris, et al.,

2010). Among these successes, key approaches involved addressing providers, patients, and systems concurrently, as well as establishing continuous measurement and feedback mechanisms.

While QI can encompass a large variety of interventions, the 5S management tool provides a good example of success. In Sri Lanka, it led to reduced rates of infection, stillbirth, and maternal mortality 2 years after its implementation, and in Tanzania, it led to reductions in patient wait times as a result of smoother operations that came about from 5S activities. The success of 5S as a QI tool is based upon its seamless integration of the factors that contribute to sustainability that were mentioned in Part 2. Following the establishment of buy-in from upper management (ensuring strong leadership from the onset), frontline staff are immediately included through cleaning and sorting their work environment, thereby acquiring their motivation and establishing the right attitudes and behavior. Next, the development of team guidelines and activities for maintaining cleanliness ensures that all staff are involved in capacity building, thus strengthening the skills of on-site staff. The continuing implementation of the model involves experts conducting monitoring and supervisory visits periodically. All of these steps can be applied to WASH services: beyond performing a basic cleaning of WASH infrastructure, checklists and protocols can be established to ensure their continuing operation through the involvement of designated staff. Such checklists can be used for monitoring and evaluation procedures, by which HCFs can continually learn what are the strengths and gaps in their WASH services.

There are a variety of QI tools that are already in use, and 5S is only one example. While WASH has not been explicitly applied to a QI framework before, aspects of existing tools like WASH FIT and CCA already incorporate tasks that are very much like 5S, illustrating that embedding WASH into existing QI frameworks would indeed be appropriate. Since QI frameworks are already familiar to government institutions, it may be relatively seamless to incorporate WASH within them. Doing so would ensure sustainability because government support is embedded from the beginning, making it more likely that HCFs have the technical support and financial resources they need to achieve their WASH goals.

Conclusion

There is still a long way until the achievement of universal WASH coverage at health care facilities, and ensuring sustainability of those WASH services will be an ongoing challenge. However, this landscape review shows that there are numerous opportunities for success, particularly because frameworks to improve quality of care at HCFs already exist. These frameworks provide an entry for WASH to become embedded more sustainably in the daily operations of HCFs, and may eventually lead to significantly improved coverage of WASH services globally.

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