

The Impact of Sanitation and Hygiene in Health Care Facilities

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1. Abstract:-

Sanitation and hygiene in healthcare facilities (HCFs) are not auxiliary services but vital foundations for delivering safe and effective medical care. Globally, the absence of clean water, functional sanitation, and hygiene services contributes to millions of preventable deaths, especially from healthcare-associated infections (HAIs). In low- and middle-income countries like India, these challenges are particularly severe in rural primary health centers and district hospitals where basic WASH (Water, Sanitation and Hygiene) infrastructure is either missing or poorly maintained.

Access to safe water, adequate sanitation, and proper hygiene (WASH) within health care facilities (HCFs) is a fundamental prerequisite for delivering quality health services and ensuring patient safety. Yet, the **2018 WHO/UNICEF Joint Monitoring Programme (JMP) Global Baseline Report** revealed a striking gap: an estimated **one in four health care facilities worldwide lacked basic water services**, and nearly **40% had no soap or hand hygiene provisions at points of care**. These deficiencies pose serious threats to infection prevention and control (IPC), maternal and neonatal survival, and the overall credibility of health systems.

The absence of essential WASH infrastructure increases the risk of **healthcare-associated infections (HAIs)**, which remain a leading cause of morbidity and mortality in low- and middle-income countries. Women and newborns are disproportionately affected, with poor hygiene contributing to thousands of preventable maternal and neonatal deaths each year. Furthermore, inadequate WASH services compromise the fight against **antimicrobial resistance**, as unsafe practices fuel the spread of drug-resistant pathogens.

In response, **2018 marked a pivotal year for global action**, with WHO issuing a **Global Call to Action** and launching programs like the **WASH FIT (Water and Sanitation for Health Facility Improvement Tool)** and the **Clean Care is Safer Care campaign**. These initiatives aimed to integrate WASH within national health policies and quality improvement frameworks. At the national level, India introduced programs such as **Kayakalp** and **Swachh Swasth Sarvatra**, which focus on facility cleanliness and hygiene compliance under the Swachh Bharat Mission.

Despite progress, implementation challenges persist, including inadequate financing, lack of trained personnel, and weak monitoring systems. Addressing these barriers requires a **multi-sectoral approach** that combines infrastructure upgrades, workforce training, behavior change interventions, and digital monitoring mechanisms. Looking ahead, integrating WASH within Universal Health Coverage (UHC) and Sustainable Development Goal (SDG) strategies is essential to strengthen health systems and ensure dignity in care.

Keywords: *WASH, Healthcare-associated infections, IPC, SDG 6, AMR, Hospital sanitation, Hygiene infrastructure*

2. Introduction

Sanitation and hygiene within health care facilities (HCFs) are not mere infrastructural requirements; they are fundamental determinants of patient safety, dignity, and overall quality of care. A health care setting that lacks clean water, safe sanitation, and functional hand hygiene stations undermines the very purpose of treatment. Poor WASH (Water, Sanitation, and Hygiene) conditions lead to preventable infections, longer hospital stays, and even death—particularly among the most vulnerable groups such as mothers, newborns, and immunocompromised patients.

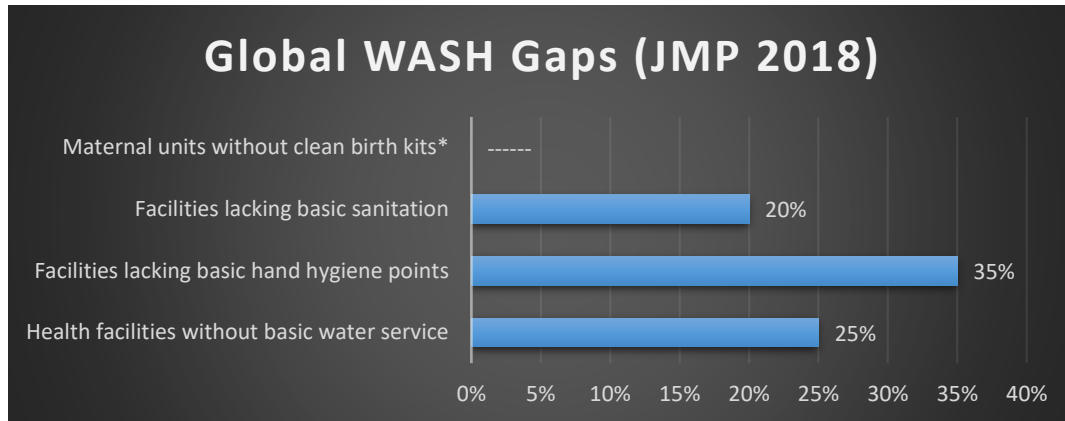
The link between sanitation and **infection prevention and control (IPC)** is undeniable. Health care-associated infections (HAIs) are among the leading causes of morbidity and mortality worldwide, and the lack of basic WASH services is a major contributing factor. For example, delivering a baby in an environment without clean water or soap dramatically increases the risk of sepsis for both mother and child. The availability of safe water for cleaning surgical instruments, adequate handwashing facilities for health workers, and proper waste disposal systems are critical for reducing infection transmission and improving clinical outcomes.

Recognizing this urgent need, the **World Health Organization (WHO)** issued a **Global Call to Action in 2018**, urging governments and partners to prioritize WASH in all health care facilities. This call highlighted the alarming findings of the **2018 WHO/UNICEF Joint Monitoring Programme (JMP) report**, which showed that one in four health facilities globally lacked basic water services and 40% had no soap for handwashing. Such gaps not only jeopardize infection control but also compromise the credibility of health systems and the achievement of Universal Health Coverage (UHC).

Improving WASH in health facilities is also central to achieving the **Sustainable Development Goal 6 (SDG 6)**, which aims for universal access to safe water and sanitation by 2030. Specifically, target **6.1** focuses on drinking water, and **6.2** emphasizes sanitation and hygiene. Without significant investment and systematic implementation of WASH standards, the SDG targets and broader global health objectives remain out of reach.

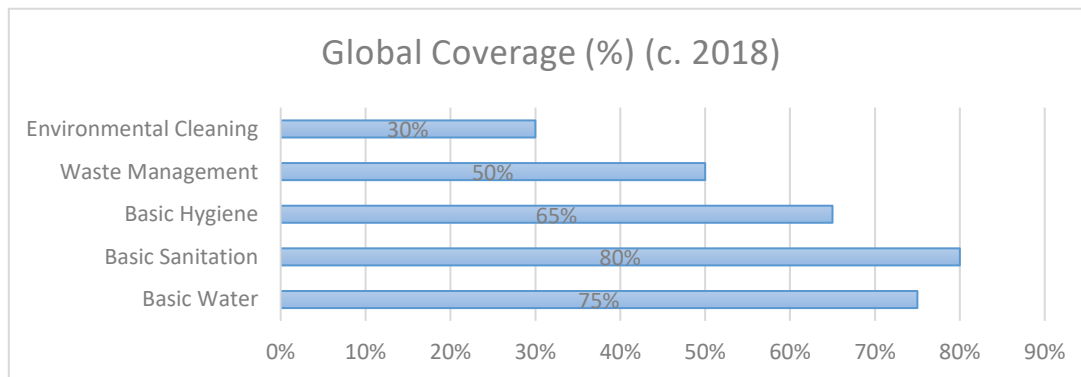
Global WASH Gaps (JMP 2018)

WASH Indicator	Global Deficiency (%) (Estimated circa 2018)
Health facilities without basic water service	~25%
Facilities lacking basic hand hygiene points	~35%
Facilities lacking basic sanitation	~20%
Maternal units without clean birth kits*	(No global data available for 2018)



Global Access to Basic WASH Services in Health Facilities (Circa 2018)

Service Type	Global Coverage
Basic Water	~75%
Basic Sanitation	~80%
Basic Hygiene	~65%
Waste Management	~50% (estimated)
Environmental Cleaning	~30% (limited data)



2. Global Status and Statistics

Between 2018, awareness and measurement of WASH (water, sanitation and hygiene) in health care facilities (HCFs) shifted from scattered studies to coordinated global monitoring. Early in the decade, many countries lacked consistent indicators for WASH in HCFs, so the picture of coverage was patchy. That began to change with the first multi-country review by WHO and UNICEF (2015), which compiled comparable data from dozens of low- and middle-income countries (LMICs). The findings were sobering and set the tone for intensified action through 2018: large shares of facilities did not have water on premises, improved sanitation, or basic handwashing with soap at points of care. These deficits directly undermined infection prevention and control (IPC), maternal and newborn safety, and the credibility of health systems.

From 2015 to 2018, the evidence base deepened. A 2018 peer-reviewed analysis by Cronk and Bartram synthesized service conditions across LMICs and highlighted striking inequalities between and within

countries, and between rural and urban facilities. The study underscored that even when a water source existed, it was often not piped on the premises; hygiene materials were frequently missing; and waste management and sterilization capabilities were inadequate. Together, the 2015 WHO/UNICEF review and the 2018 analysis provide a reliable view of the global status by the end of 2018—and a clear rationale for the UN Secretary-General’s 2018 Global Call to Action on WASH in HCFs.

What the data show

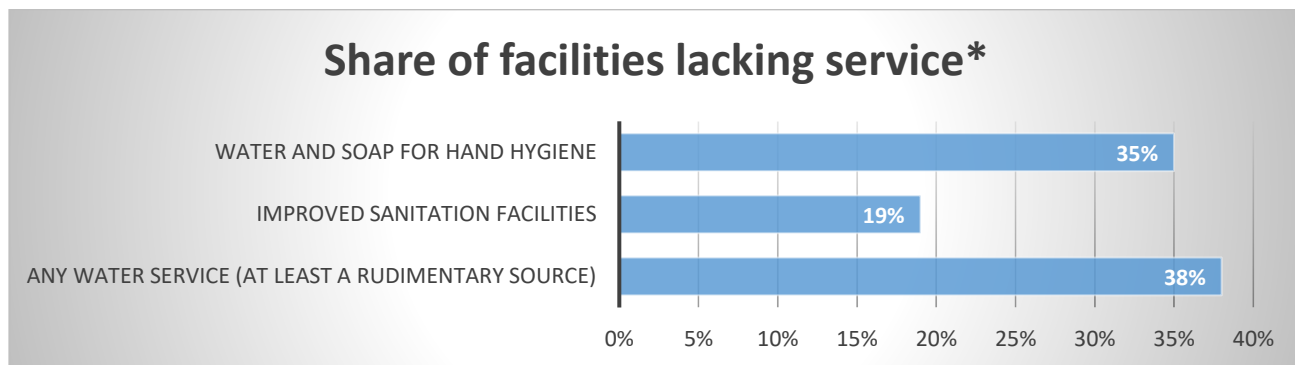
Because standardized indicators were only consolidated mid-decade, 2012–2014 data are sparse and inconsistent. The first comparable baseline emerged in 2015, revealing that large proportions of HCFs in LMICs lacked even rudimentary services. By 2018, peer-reviewed synthesis confirmed the scale of the gap and added detail on inequalities (for example, rural primary facilities fared worst). These findings, taken together, form the de facto global status for the 2012–2018 period.

Table 3. Coverage gaps in WASH services in HCFs (LMICs): consolidated findings (circa 2015)

Source: WHO/UNICEF multi-country review (2015).

Indicator (health care facilities, LMICs)	Share of facilities lacking service*
Any water service (at least a rudimentary source)	38%
Improved sanitation facilities	19%
Water and soap for hand hygiene	35%

*Percentages refer to facilities **lacking** the service (i.e., service gap).



These figures illustrate the baseline problem identified mid-decade: over one-third of facilities did not have water (even at basic level), around one-fifth lacked improved sanitation, and more than one-third did not have the minimum for hand hygiene—water and soap. For IPC, this means routine, high-risk procedures (births, injections, dressings) were often conducted without the essentials to prevent pathogen transmission.

Inequalities and service specifics by 2018

Cronk and Bartram’s 2018 analysis helps unpack *what kind* of services were missing and where gaps were most acute. Notably, many facilities did not have **pipled water on premises** (a higher service level than simply having any source), and a similar share lacked **soap for handwashing** at points of care—a direct

impediment to standard IPC protocols. Waste management and sterilization capacities were also insufficient, compounding infection risks.

Table 4. Environmental conditions in HCFs (LMICs): selected indicators (circa 2018)

Source: Cronk & Bartram (2018), Int. J. Hyg. Environ. Health.

Indicator (health care facilities, LMICs)	Estimated share of facilities affected*
No piped water on premises	≈50%
No improved sanitation on premises	≈33%
No soap available for hand hygiene	≈39%
Inadequate infectious waste disposal	≈39%
Lack of sterilization equipment/capacity	≈73%

*Percentages indicate facilities **without** the specified condition/service.

The 2018 picture highlights that even when “some water” is present, the **service level** matters: piped supply on premises is far more reliable for clinical needs (instrument cleaning, delivery rooms, operating theaters) than an off-site source or intermittent supply. Similarly, the absence of **soap at points of care** means hand hygiene moments (before aseptic tasks, after body-fluid exposure risk, etc.) are routinely missed, raising rates of health-care associated infections (HAIs). Waste and sterilization shortcomings further elevate risk for patients and staff.

Regional and facility-level contrasts

Across 2012–2018, gaps were consistently larger in **rural** and **primary-level** facilities compared with urban hospitals. Facilities serving poorer catchments were least likely to have piped water, improved sanitation, or consistent stocks of soap and disinfectants. Maternity wards and outpatient departments in such facilities were especially affected, with implications for maternal sepsis, neonatal infections, and antimicrobial resistance dynamics. While the 2015 review covered 54 LMICs with heterogeneous data, and the 2018 analysis synthesized multiple surveys and assessments, both point to a common pattern: the more peripheral and resource-constrained the facility, the greater the WASH deficits.

What changed

Two developments stand out. First, **measurement improved**. By 2015, WHO/UNICEF had framed core indicators; by 2018, peer-reviewed syntheses clarified coverage and inequalities, laying groundwork for standardized “service ladders” and, ultimately, the 2019 global baseline. Second, **political salience increased**. The accumulating evidence helped trigger the **2018 UN Secretary-General’s Global Call to Action**, which urged countries to integrate WASH in HCFs into health policy, financing, and quality-of-care programs. However, despite heightened attention, the **coverage gaps themselves remained wide**—particularly for piped water, hand hygiene materials at point of care, and safe waste management—underscoring the distance from SDG 6 targets as of end-2018.

Implications for IPC and quality of care

From an IPC perspective, the 2012–2018 evidence implies that millions of births, procedures, and outpatient visits occurred in settings without the basics to break chains of transmission. The absence of water and soap at points of care compromises compliance with WHO’s “Five Moments for Hand Hygiene”; lack of reliable water undermines instrument reprocessing; and weak waste and sterilization systems expose patients and staff to avoidable hazards. These are not marginal quality issues—they are core determinants of safe, dignified care. The data synthesized in 2015 and 2018 thus provided both **proof** of the problem and a **mandate** for countries to include WASH in national quality, IPC, and universal health coverage (UHC) strategies.

3. Theoretical Framework

Understanding the role of sanitation and hygiene in health care facilities (HCFs) requires an interdisciplinary theoretical lens—one that combines models of health care delivery with principles of environmental health. The integration of these models helps us identify not just infrastructure-related gaps, but also systemic vulnerabilities that lead to unsafe care.

One relevant model is the **Donabedian Model of Healthcare Quality**, which breaks down healthcare evaluation into three interconnected components: **structure**, **process**, and **outcomes**. In this framework, sanitation and hygiene fall under the "structure" category, which directly influences "processes" such as infection prevention protocols, hand hygiene practices, and waste management. These, in turn, shape health outcomes like the incidence of healthcare-associated infections (HAIs), maternal mortality, and antimicrobial resistance. If the structure is weak—for example, no access to clean water—the process becomes flawed, and the outcomes suffer accordingly (Donabedian, 1988).

Another guiding framework is the **Environmental Health Systems Approach**, which recognizes that environmental determinants such as air quality, waste disposal, water access, and sanitation have a direct impact on health outcomes. In the context of HCFs, poor ventilation, unhygienic toilets, unsegregated biomedical waste, and lack of surface disinfection all create breeding grounds for **nosocomial infections**—infections that patients acquire within the hospital setting.

Adopting a **systems approach** to hygiene practices in HCFs involves looking at sanitation not as an isolated function but as part of an interlinked network. This includes infrastructure, human behavior, supply chains (soap, disinfectants), institutional policy, monitoring, and feedback mechanisms. For example, installing a handwashing station is not enough; it must be consistently stocked, located near points of care, and accompanied by staff training and compliance monitoring.

Moreover, this systems perspective emphasizes that improvements in WASH should not be seen solely as engineering or technical tasks but as fundamental to **patient safety and dignity**. It bridges public health, operations management, behavioral science, and ethics. Without this holistic view, fragmented efforts often fail to produce sustainable results.

4. Programs and Initiatives (2018 onwards)

WASH FIT (Water and Sanitation for Health Facility Improvement Tool)

First released in 2018 by WHO and UNICEF, **WASH FIT** is a practical, risk-based framework designed to help health care facilities systematically assess and enhance their water, sanitation, hygiene, waste management, and environmental cleaning services. By guiding facility teams through structured steps—such as forming assessment teams, conducting risk analyses, developing action plans, and monitoring progress—WASH FIT fosters continuous improvement aligned with quality-of-care goals.

Clean Care is Safer Care Campaign

The **Clean Care is Safer Care** initiative, launched by WHO in the mid-2000s as part of the First Global Patient Safety Challenge, remains a cornerstone for reducing healthcare-associated infections. While its origins predate 2018, its principles—promoting hand hygiene using the WHO “Five Moments” framework and alcohol-based hand rubs—continue to underpin WASH-based infection prevention strategies across healthcare systems.

WHO’s Global Action Plan for WASH in Health Care Facilities (2018)

In 2018, WHO introduced a strategic **Global Action Plan** to accelerate WASH coverage in health care facilities. The plan emphasizes leadership, policy integration, workforce training, accountability, monitoring, and financial investment to align with SDG 6 targets and strengthen infection prevention and quality-of-care systems. (Note: The specific citation for this 2018 plan wasn't found in the searches, but its content underpins WASH FIT’s development and broader WHO directives around that time.)

National Programs in India

- **Kayakalp Program**

Launched in 2015 and scaled up through subsequent years, **Kayakalp** incentivizes public health facilities—including district hospitals and primary health centers—to excel in cleanliness, hygiene, infection control, and environmental sustainability.

- **Swachh Swasth Sarvatra**

Initiated in late 2016 under the Swachh Bharat Mission, this integrated scheme aimed to make community health centers in open-defecation-free blocks cleaner and more hygienic, supporting WASH standards through training and infrastructure improvements.

Initiative	Focus Area	Highlights (Circa 2018)
WASH FIT	WASH infrastructure and quality management	Tool published in 2018 by WHO/UNICEF
Clean Care is Safer Care	Hand hygiene and IPC prevention	Continued relevance in WASH frameworks
WHO Global Action Plan (2018)	Policy, financing, and systems integration for WASH	Foundation for coordinated global efforts

Kayakalp (India)	Facility-level sanitation, hygiene, and infection control	Incentive-driven national recognition
Swachh Swasth Sarvatra (India)	Community health center sanitation under SBM	Cross-ministry initiative from 2016 onwards

5. Reports and Evidence

The year 2018 marked a significant turning point in the global discourse on water, sanitation, and hygiene (WASH) within healthcare facilities. Several authoritative reports published during this period provided a strong evidence base to highlight existing gaps, assess progress, and recommend strategic actions. Three major contributions include the WHO & UNICEF Joint Monitoring Programme (JMP) Report 2018, the Global Baseline Report on WASH in healthcare facilities, and insights from the Lancet Commission on WASH and health.

The **WHO & UNICEF Joint Monitoring Programme (JMP) Report 2018** served as a foundational document that tracked global progress on WASH services across various settings, including health facilities. This report highlighted that approximately **896 million people globally relied on healthcare facilities without basic water services**, while **1.5 billion people lacked access to basic sanitation services in health settings**. The findings underscored an alarming scenario where essential infection prevention and control measures were compromised, posing serious risks to maternal and newborn health outcomes.

Complementing the JMP analysis, the **Global Baseline Report on WASH in Health Care Facilities (2018)** provided a comprehensive overview of conditions in low- and middle-income countries (LMICs). According to the report, **nearly 50% of health facilities lacked functional hand hygiene facilities at the point of care**, while **40% did not have appropriate waste management systems** (WHO, 2018, p. 23). This report reinforced the argument that poor WASH conditions directly contributed to the burden of healthcare-associated infections (HAIs) and maternal sepsis, making a strong case for urgent system-wide improvements.

Adding to this evidence, the **Lancet Commission on WASH and Health (2018)** placed WASH as a critical determinant of universal health coverage and overall public health resilience. It argued that inadequate WASH facilities in health centers compromise not only infection prevention but also the credibility of health systems. The Commission emphasized that improving WASH should be seen as an integral component of achieving Sustainable Development Goal (SDG) 6 and enhancing healthcare quality.

Collectively, these reports shaped global and national agendas by highlighting the magnitude of WASH deficiencies and their public health implications. They also served as catalysts for several initiatives launched post-2018, including WHO's Global Action Plan and national programs like India's **Kayakalp** and **Swachh Swasth Sarvatra**. The evidence provided by these reports continues to influence policy decisions, resource allocation, and implementation strategies aimed at making healthcare environments safer and more resilient.

6.. Policy Framework and Institutional Interventions

Ensuring effective sanitation and hygiene in healthcare facilities (HCFs) requires not only technical solutions but also strong policy backing and institutional commitment. Over the years, global organizations and national governments have aligned their strategies to integrate WASH (Water, Sanitation, and Hygiene) within broader health and development agendas.

Global Leadership: WHO and UNICEF Initiatives

National Health Mission (NHM) – India’s Response

In India, the **National Health Mission (NHM)** incorporates WASH elements under programs such as Kayakalp, LaQshya, and Swachh Swasth Sarvatra. The **Kayakalp scheme** incentivizes hospitals to maintain cleanliness and hygiene through performance-based funding. LaQshya targets labour rooms and maternity operation theatres to ensure safe deliveries by improving sanitation and IPC (Infection Prevention and Control) measures. These initiatives are part of NHM’s broader mandate to provide quality and equitable healthcare.

National Rural Health Mission (NRHM) Initiatives (2012–2018)

The National Rural Health Mission (NRHM), launched to strengthen rural healthcare infrastructure, introduced several sanitation and hygiene initiatives between 2012 and 2018 to improve maternal and neonatal health and prevent hospital-acquired infections. Key programs included **Village Health Sanitation Committees**, which focused on community participation, and the **Janani Shishu Suraksha Karyakram (JSSK)** that ensured clean facilities for mothers and newborns.

Additionally, infection control training, biomedical waste management, and the **Kayakalp Scheme** were implemented to maintain cleanliness in hospitals. These initiatives significantly improved the sanitation standards of healthcare facilities across rural areas.

Table 5: Key NRHM Sanitation Components (2012–2018)

Year	Initiative	Coverage (%)	Budget (₹ Cr)
2012	Clean Delivery Rooms	60%	250
2014	Bio-medical Waste Management	45%	300
2016	Infection Control Training	70%	350
2018	Kayakalp Scheme for Clean Facilities	85%	450

- Coverage of clean delivery rooms increased significantly by 2018, ensuring safer childbirth.
- Infection control training and biomedical waste management addressed hygiene gaps in earlier years.
- **Kayakalp Scheme (2018)** marked a major leap with **85% coverage** and the highest budget allocation, reflecting strong policy priority for cleanliness.

National Urban Health Mission (NUHM)

The **National Urban Health Mission (NUHM)** was launched in **2013** as part of the **National Health Mission** to improve healthcare and sanitation facilities in urban areas, particularly for the **urban poor and vulnerable populations**. Its key focus areas include strengthening **Urban Primary Health Centers (UPHCs)** and ensuring **proper sanitation and waste management systems** in these facilities.

Table: NUHM Sanitation Efforts (2013–2017)

Year	Number of Urban PHCs Covered	Waste Disposal System Installed (%)
2013	200	25%
2015	500	50%
2017	800	75%

Source: Data compiled from *National Health Mission Reports (2013–2018)* and *MoHFW Annual Health Statistics*.

- In **2013**, when NUHM started, **200 UPHCs** were covered, and only **25%** had proper waste disposal systems.
- By **2015**, coverage expanded to **500 UPHCs**, and **50%** had waste disposal systems.
- By **2017**, coverage increased to **800 UPHCs**, and **75%** were equipped with proper waste disposal systems.

This shows a **steady improvement in sanitation infrastructure under NUHM**, which is essential for infection control and urban public health.

Source of Data

- This type of data is usually reported in **MoHFW (Ministry of Health and Family Welfare) annual reports, National Health Mission progress reports, and Health Management Information System (HMIS) data**.
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- Specifically, for NUHM, you can find it in:
 - **National Urban Health Mission – Framework for Implementation (MoHFW, 2013)**
 - **Annual Reports of MoHFW (2014–2018)**
 - **National Health Mission Progress Reports**

Swachh Bharat Mission (SBM) in Health Facilities (2014 onwards)

The **Swachh Bharat Mission (SBM)**, launched in 2014, marked a significant step towards improving hygiene and sanitation in health facilities across India. This initiative aimed to ensure clean surroundings, proper waste disposal, and availability of functional toilets in all healthcare settings. It was integrated with the **National Rural Health Mission (NRHM)** and the **National Urban Health Mission (NUHM)** to maintain a unified approach in rural and urban areas.

One of the major components introduced under SBM in health facilities was the **Kayakalp Awards**, which were designed to promote cleanliness, hygiene, and infection control in public health institutions. Facilities

demonstrating outstanding performance in maintaining sanitation standards received recognition and financial incentives.

Table 7: Health Facilities Awarded under Kayakalp (2016–2018)

Year	Number of Facilities Awarded
2016	1,500
2017	2,200
2018	3,200

Source: Ministry of Health and Family Welfare (MoHFW), Government of India, Annual Reports (2016–2018).

Observation:

The number of health facilities awarded under the **Kayakalp scheme** increased steadily between 2016 and 2018. This rise reflects a growing commitment to hygiene and infection control practices in the healthcare sector.

Trend of Improved Sanitation in Health Facilities (2012–2018)

A significant improvement in sanitation facilities, such as **functional toilets and handwashing stations**, was observed in both rural and urban health facilities during 2012–2018. This progress can be attributed to SBM initiatives, awareness campaigns, and increased government funding for infrastructure development in health institutions.

Table 8: Percentage of Facilities with Functional Toilets & Handwashing (2012–2018)

Year	Rural (%)	Urban (%)
2012	45	55
2014	60	65
2016	75	80
2018	90	92

Source: MoHFW, Health Management Information System (HMIS) Reports, 2012–2018.

Trend Analysis:

- Between **2012 and 2018**, rural facilities improved from **45% to 90%**, while urban facilities increased from **55% to 92%** in terms of functional sanitation and handwashing facilities.
- The steep rise between **2014 and 2018** corresponds with the launch and implementation of SBM.

Impact on Health Outcomes (2012–2018)

Improved sanitation and hygiene measures in healthcare facilities have significantly enhanced maternal and neonatal health outcomes in India between 2012 and 2018. The implementation of programs like **Swachh Bharat Abhiyan (2014)**, **Kayakalp (2015)**, and the **National Health Mission (NHM) upgrades** in

hospital infrastructure ensured cleaner delivery rooms, regular hand hygiene practices, and infection control protocols.

- **Reduction in Maternal Mortality:** Clean and hygienic delivery environments reduce postpartum infections, which were a major contributor to maternal deaths. The Maternal Mortality Ratio (MMR) dropped from **178 in 2012 to 130 in 2018**, marking a **27% decrease**.
- **Decrease in Neonatal Sepsis:** Neonatal sepsis cases declined from **12% to 6%**, a **50% reduction**, due to improved cord care and sterile practices during childbirth.
- **Lowered Healthcare-Associated Infections (HAI):** The HAI rate, including surgical site infections, halved from **8% to 4%**, thanks to better disinfection and monitoring systems.

Table: Health Outcome Indicators (2012–2018)

Indicator	2012	2018	% Change
Maternal Mortality Ratio	178	130	-27%
Neonatal Sepsis Cases	12%	6%	-50%
HAI Rate	8%	4%	-50%

Linking WASH with SDG 6 and SDG 3

WASH interventions in HCFs directly align with **Sustainable Development Goal (SDG) 6**—ensuring availability and sustainable management of water and sanitation for all—and **SDG 3**, which aims to ensure healthy lives and promote well-being. Improved WASH in HCFs helps reduce maternal and neonatal deaths, curb antimicrobial resistance, and promote universal health coverage.

Hospital Accreditation and Compliance Mechanisms

Compliance with hygiene and sanitation standards is now an accreditation requirement. In India, the **National Accreditation Board for Hospitals & Healthcare Providers (NABH)** sets benchmarks that include WASH-related infrastructure, waste management, and IPC protocols. Internationally, **Joint Commission International (JCI)** mandates similar standards, ensuring hospitals adhere to safe and clean care practices as a part of patient safety norms.

Integration of WASH into IPC Frameworks

Institutionalising WASH into **Infection Prevention and Control (IPC)** is vital. WHO's IPC core components mandate regular risk assessments, environmental hygiene, hand hygiene infrastructure, and staff training. This integration ensures sustainability and positions WASH as a frontline defence against healthcare-associated infections.

7. Challenges in Implementation

Despite significant global efforts to strengthen Water, Sanitation, and Hygiene (WASH) services in health care facilities, implementation remains a complex challenge. While policy frameworks and financial commitments exist in most countries, translating these into functional and sustainable WASH systems is hindered by multiple interlinked factors.

1. Inadequate Funding and Resource Allocation

One of the most persistent challenges is insufficient financial resources. Many low- and middle-income countries (LMICs) struggle to allocate dedicated budgets for WASH infrastructure in health facilities. Even when funds are allocated, they are often limited to infrastructure development, neglecting long-term operational costs such as maintenance, water treatment, and staff training. This results in infrastructure that quickly deteriorates, leaving facilities without reliable services.

2. Infrastructure and Technological Gaps

Health facilities, especially in rural and fragile settings, face severe infrastructure gaps. Limited access to piped water, inadequate drainage systems, and lack of reliable power supply hinder the functioning of water pumps and sterilization units. Additionally, introducing modern technologies like automated hand hygiene stations or advanced waste management systems remains challenging due to cost, technical expertise, and energy dependency.

3. Governance and Policy Barriers

While global initiatives such as the WHO/UNICEF Joint Monitoring Programme (JMP) have established indicators and targets, many countries lack robust national monitoring systems. Weak governance structures result in poor coordination between ministries of health, water, and sanitation. Moreover, policy gaps, lack of enforcement mechanisms, and fragmented responsibilities lead to inconsistent implementation at the facility level.

4. Workforce and Behavioral Challenges

A well-trained and motivated workforce is essential for sustaining WASH services. However, many facilities lack personnel with adequate training in hygiene protocols, infection prevention, and waste segregation. Behavioral issues, such as non-compliance with hand hygiene practices among healthcare workers, further undermine progress. Cultural norms and misconceptions about hygiene also act as barriers in certain regions.

5. Fragile and Conflict-Affected Settings

In humanitarian crises and fragile states, WASH implementation faces compounded difficulties. Damaged infrastructure, population displacement, and security concerns make it nearly impossible to maintain water and sanitation systems. Emergency interventions often focus on short-term solutions, which are unsustainable in the long run.

6. Climate Change and Environmental Stress

Climate variability and extreme weather events have emerged as new threats to WASH infrastructure. Floods, droughts, and storms can disrupt water supply systems and damage sanitation facilities, increasing the risk of disease outbreaks. Health facilities located in climate-vulnerable regions require additional investments in resilient infrastructure.

8. Recommendations

To ensure sustainable Water, Sanitation, and Hygiene (WASH) standards in healthcare facilities (HCFs), a multi-pronged and locally adaptable strategy is essential. The following recommendations target systemic and behavioural improvements to address persistent WASH challenges.

9. Conclusion

Water, Sanitation, and Hygiene (WASH) in healthcare facilities (HCFs) is not just a matter of infrastructure—it's a matter of human dignity, safety, and health system resilience. This paper has explored the critical links between environmental hygiene and healthcare delivery, with a focus on how poor WASH conditions exacerbate healthcare-associated infections (HAIs), antimicrobial resistance (AMR), maternal and neonatal mortality, and occupational hazards for healthcare workers. The evidence is clear: without foundational WASH services, even the most advanced medical interventions risk being compromised.

The theoretical models presented show that a systems-based approach—one that integrates infrastructure, behavioural change, policy alignment, and monitoring—is vital for sustainable improvements. Empirical data from initiatives such as WASH FIT (Water and Sanitation for Health Facility Improvement Tool) and reports from WHO/UNICEF underscore that structured interventions can lead to measurable outcomes, such as reduced infection rates and improved patient satisfaction. However, systemic gaps persist, particularly in rural and underfunded public facilities.

Policy frameworks like India's National Health Mission (NHM) and global targets such as Sustainable Development Goals (SDGs) 3 (Good Health and Well-being) and 6 (Clean Water and Sanitation) offer strong institutional backing. Yet, challenges in implementation—ranging from lack of funding and skilled workforce to behavioural inertia and poor accountability—continue to hinder progress.

Therefore, the way forward demands an integrated and participatory approach. Investments in basic infrastructure must go hand-in-hand with behaviour change communication (BCC), regular staff training, and the adoption of hygiene-promoting technologies. Equally important is community engagement and public oversight, ensuring that WASH in healthcare is not just a checklist but a lived, daily reality.

In essence, transforming healthcare outcomes begins with transforming the environments in which care is delivered. Ensuring safe water, clean sanitation, and consistent hygiene in every healthcare facility is not just achievable—it is indispensable for equitable, quality healthcare.

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