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The last-mile challenge: Water, sanitation, and hygiene (WASH) in the Philippines

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The Last-Mile Challenge: Water, Sanitation, and Hygiene (WASH) in the Philippines

Valerie Gilbert Ulep, Jann Trizia Talamayan, Lyle Daryll Casas, Jon Michael Villaseñor, and Elmira Bacatan



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Abstract

Over the years, the Philippines has made progress in improving water, sanitation, and hygiene (WASH) services. Despite this progress and sustained economic growth, waterborne diseases remain a leading cause of morbidity and hospitalization, particularly among the poorer segments of the population. Further, much still has to be done to achieve universal coverage of safely managed WASH services across all settings—schools, child development centers, health facilities, and households. These disparities contribute to a substantial disease burden driving poor health and nutrition outcomes. Using various secondary data sources, this paper deep dives into the current state of WASH in the Philippines, including its link to nutrition. This paper explores the disease burden associated with WASH, the current conditions of WASH in the Philippines pertaining to both demand and supply factors, and the governance challenges hindering the achievement of universal WASH coverage. Significant disparities in access to WASH persist, particularly among the poorest households in the poorest areas. The last mile challenge in WASH is particularly evident in the poorest regions where even basic water and sanitation services are lacking. This highlights the need to improve services for the vulnerable populations. Bridging these gaps through streamlined governance, efficient resource allocation, and targeted local interventions in underserved areas is vital to achieving universal and equitable access to safe water and sanitation.

Keywords: water, sanitation, and hygiene, last-mile challenge, Philippines

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The Last-Mile Challenge: Water, Sanitation, and Hygiene (WASH) in the Philippines

Valerie Gilbert Ulep, Jann Trizia Talamayan, Lyle Daryll Casas, Jon Michael Villaseñor, and Elmira Bacatan¹

Introduction

Access to water, sanitation, and hygiene (WASH) is critical in promoting population health and nutrition. The remarkable improvements in sanitation and access to clean water in the past century worldwide have helped reduce mortality rates and increase life expectancy at remarkable rates (Als et al. 2020; Mills and Cumming 2016). Adequate WASH facilities and practices prevent waterborne diseases, reduce childhood illnesses, and support maternal health (Arowosegbe et al. 2021; Chitty and Esteves-Mills 2015).

In the Philippines, 83% and 97% of the population were found to have access to *basic* sanitation and drinking water facilities, respectively, in recent decades. However, the urgency emphasized by the sixth Sustainable Development Goal (SDG) underscores the need for *safely managed* WASH services. In line with the overarching principle of leaving no one behind emphasized across all SDGs, SDG No. 6 highlights the need to target WASH programs toward vulnerable populations. After all, WASH is an essential service that everyone in a modern and dignified society should be able to access.

Despite the improvement in the coverage of WASH facilities, the country has not achieved universal coverage since only half of the Philippine population have access to safely managed water and sanitation services. The 2022 National Demographic and Health Survey (NDHS) further revealed that about two-thirds of the poorest Filipinos still lack access to basic WASH facilities (PSA 2022).

This paper deep dives into the current state of WASH in the Philippines, including its link to nutrition, using various secondary data sources. It explores the disease burden associated with WASH, the current conditions of WASH in the Philippines pertaining to both demand and supply factors, and the governance challenges hindering the achievement of universal WASH coverage.

Water, sanitation, and hygiene-related infections and diseases in the Philippines

Water-borne infections can lead to diarrhea due to the bacteria and viruses in contaminated water or feces (Prüss-Ustün et al. 2014). Diarrhea can harm children's overall well-being, including their physical health and nutritional status. This, in turn, can significantly impact their growth and development (Ferdous et al. 2013).

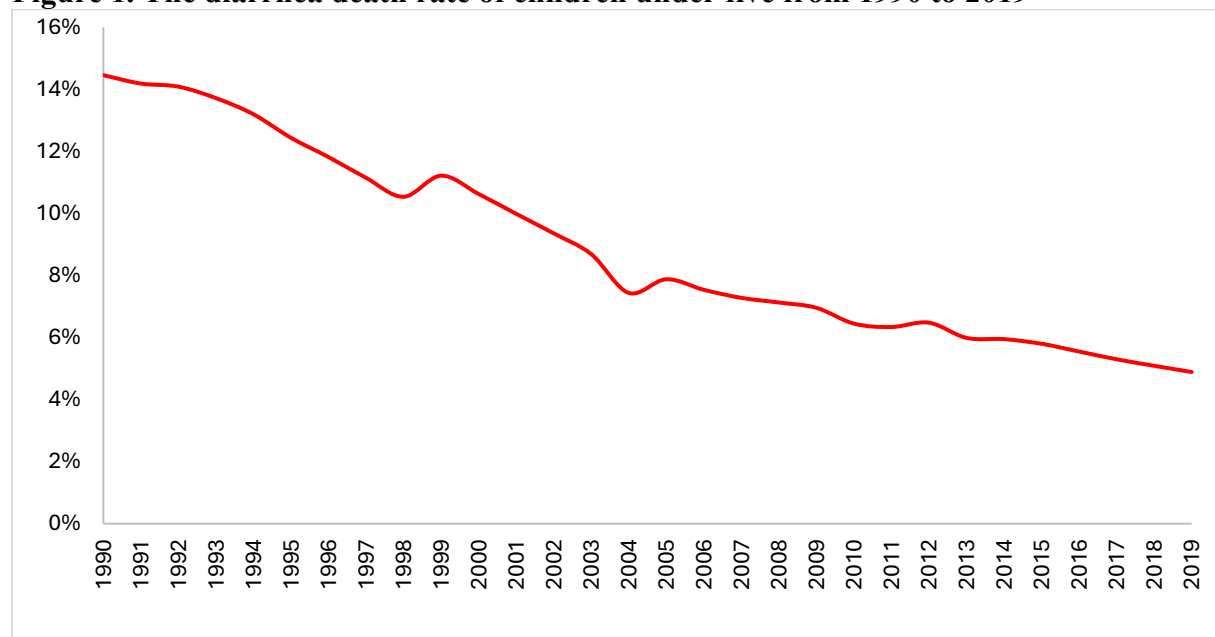
In the Philippines, around 86% of all diarrhea-related deaths in 2019 can be linked to poor access to WASH. Children under five years old constituted 35% of these deaths (IHME 2024).

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Beyond the immediate health impact, diarrhea affects nutritional well-being as it causes nutrient loss and suppresses appetite (Ferdous et al. 2013). In the Philippines, where chronic malnutrition is a persistent concern, inadequate access to WASH significantly contributes to the high prevalence of chronic malnutrition, especially among poor children (Ulep, Uy, and Casas 2022).

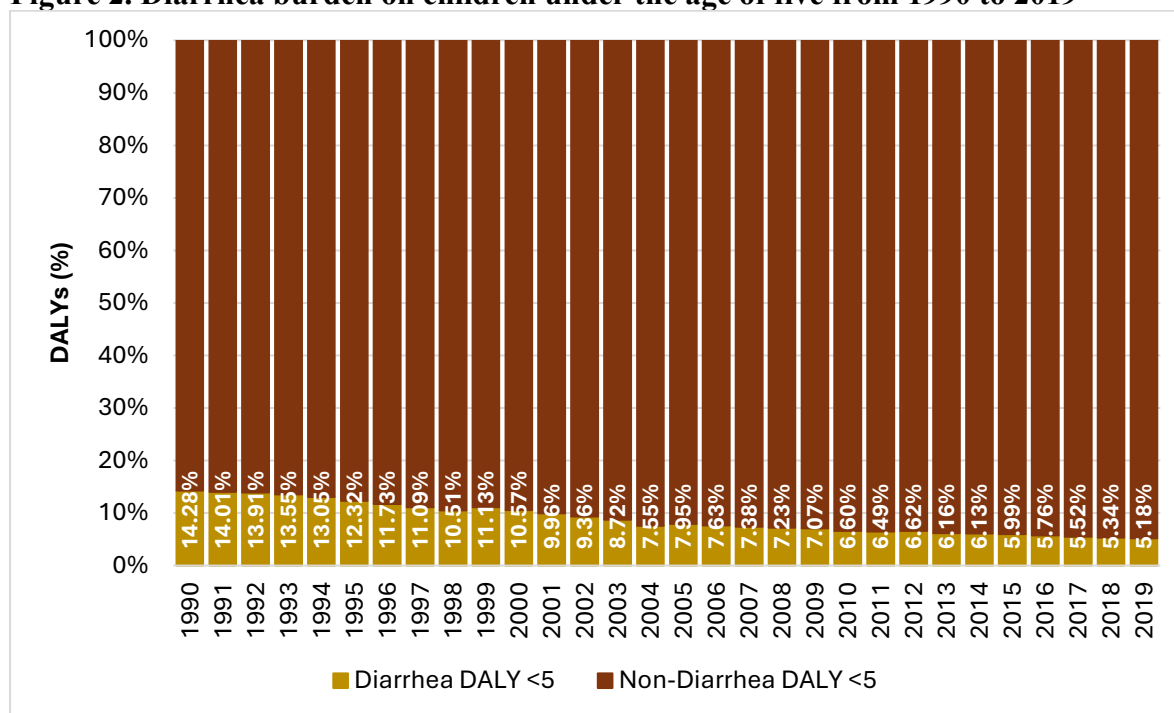
There has been, however, a decline in the burden of diarrhea in the country in recent years as characterized by an improvement in mortality rates (Figure 1) and a reduction in Disability-Adjusted Life Years (DALYs) from 14% in 1990 to 5% in 2019 among children under five (Figure 2). Several factors, such as increasing household income, which improves access to sanitation and water facilities and healthcare services, reduce diarrhea death rates (Black et al. 2019; Merid et al. 2023).

Figure 1. The diarrhea death rate of children under five from 1990 to 2019



Source: Authors' illustration of data from the Institute for Health Metrics and Evaluation (2019)

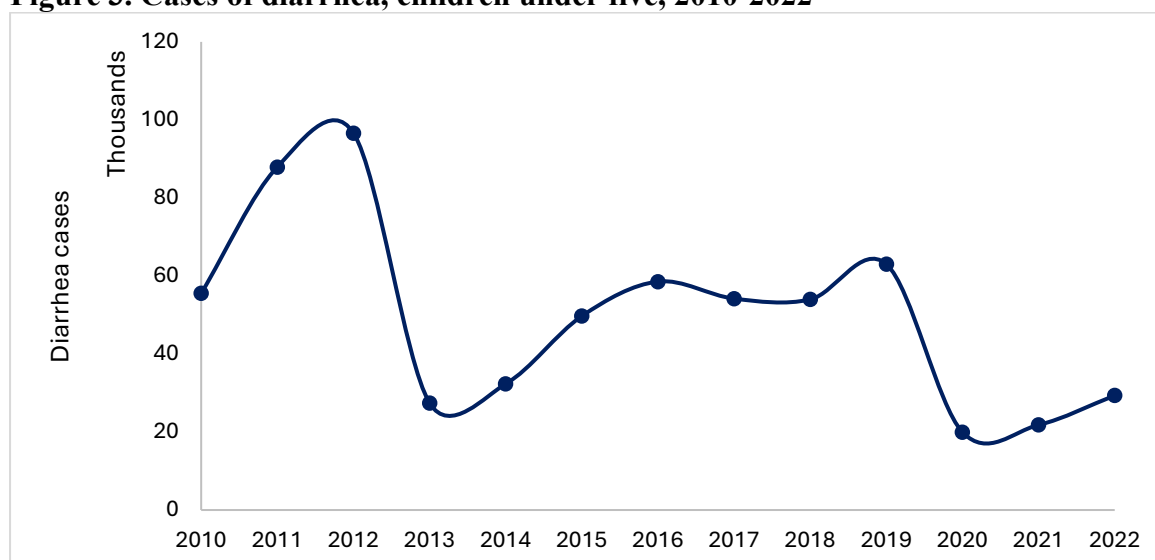
Figure 2. Diarrhea burden on children under the age of five from 1990 to 2019



Source: Authors' illustration of data from the Institute for Health Metrics and Evaluation (2019)

Figure 3 shows that cases of diarrhea among children under five significantly dropped in the last decade, although diarrhea remains one of the top causes of morbidity (DOH 2022). The significant drop may be due to the disruption in surveillance systems during the COVID-19 pandemic. In addition, diarrhea was the third most prevalent reason for hospital admissions, leading to PhilHealth reimbursement claims totaling PHP1 billion (PhilHealth 2022).

Figure 3. Cases of diarrhea, children under five, 2010-2022

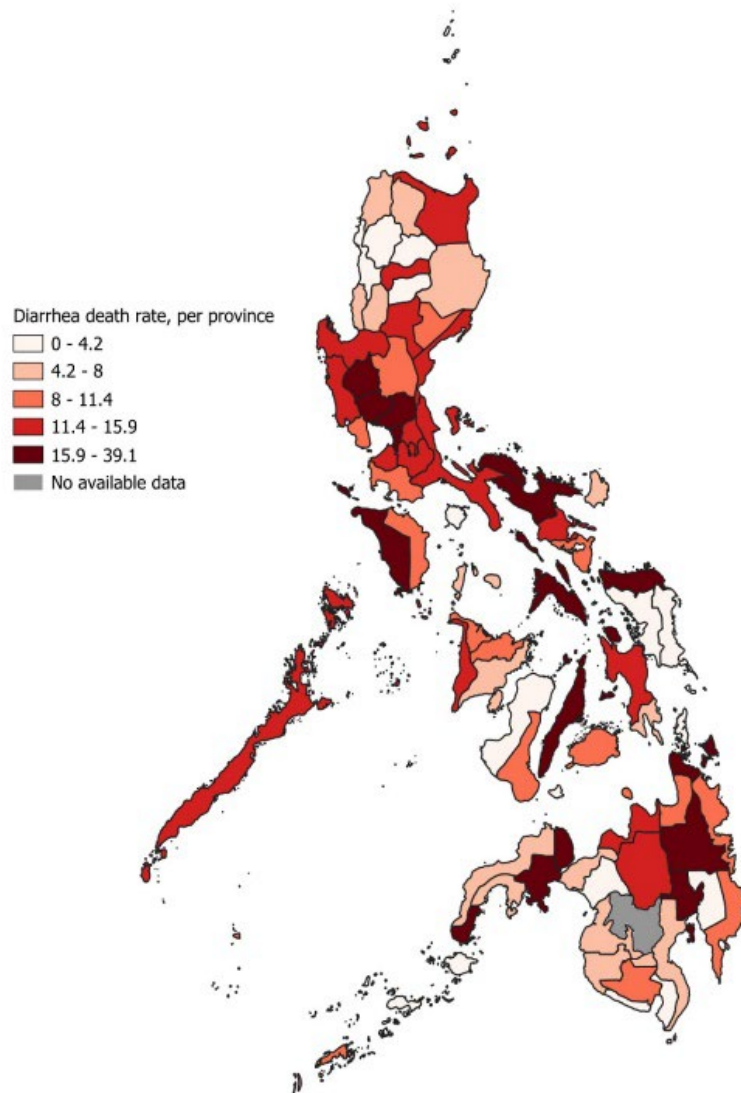


Note: The drop between 2019 and 2020 may be due to the disruption in the surveillance systems during the COVID-19 pandemic.

Source: Authors' visualization of data from the Field Health Service Information System of the Department of Health

Diarrhea death rates of children under five vary across provinces (Figure 4). There is also a positive correlation between province-level poverty incidence and diarrhea-related death rates. That is, although the country has made progress in reducing the death rate from diarrhea nationwide, certain provinces with higher poverty incidence struggle with elevated death rates from the preventable diarrheal disease.

Figure 4. The diarrhea-related death rate of children under five years old per province, 2018

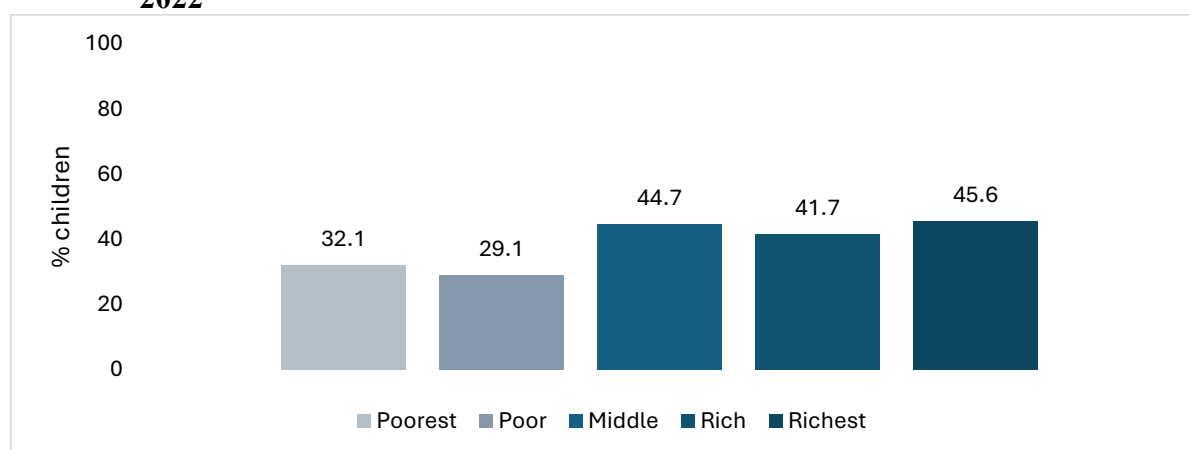


Note: The diarrhea-related death rate per province is calculated by dividing the number of deaths from diarrhea by the population of children under five years old using the Philippine Statistics Authority 2018 mortality data set with International Classification of Diseases (ICD) codes.

Source: Authors' visualization of data from Philippine Statistics Authority (2018)

The burden of diarrhea shows a socio-economic gradient. In 2021, children from poor households were found to be three times more likely to experience diarrhea compared to their affluent counterparts. Exposure of poor children to diarrhea suggests an increased susceptibility to illnesses and reinforces the need to improve access to essential primary healthcare services. Zinc and oral rehydration salts (ORS) that are delivered in primary care facilities serve as supplementary measures to prevent the severity of diarrhea. The NDHS 2022 revealed that children with diarrhea from households in the three top quintiles were more likely given advice or treatment than their counterparts (Figure 5). Further, approximately 20% of individuals who experienced diarrhea did not receive zinc and ORS.

Figure 5. Children with diarrhea for whom treatment was sought, by wealth quintile, 2022



Source: Authors' visualization of data based on National Demographic and Health Survey 2022 from the Philippine Statistics Authority

Aside from diarrhea, other diseases that stem from poor sanitation and hygiene persist. For instance, worms transmitted through soil, or soil-transmitted helminths, affect 28.4% of school-aged children in the country—a figure that exceeds the global average of 24% (Tangcalagan et al. 2022). The presence of these diseases is known to be more prevalent in resource-constrained areas facing challenging environmental conditions and where there is a higher prevalence of open defecation (Centers for Disease Control and Prevention 2022; Paller and de Chavez 2014). Soil-transmitted helminths infections make children nutritionally and physically impaired, thus hindering their growth and development. For girls and women of reproductive age, the infection leads to blood loss, which exacerbates iron deficiency anemia and increases the risk of maternal and infant mortality (WHO 2023).

Other diseases include dengue and malaria, which are infections transmitted by mosquito vectors that thrive in unsanitary areas. Poor sanitation and water management practices (such as leaving water containers uncovered) contribute to the proliferation of mosquito breeding sites (Olagunju 2023). In the Philippines, around 80,000 dengue cases were reported in 2021, with a national case fatality rate of 0.4 percent (around 300 deaths) (Department of Health 2021). In 2019, deaths in the Philippines from dengue were at 4-6 per 1,000 population of children under-five and 5-14 years old. This is the highest compared to its ASEAN peers (IHME 2024).

Poor and improper hygiene, on the other hand, creates pathways for other diseases, such as respiratory infections. Acute respiratory infections (ARI) are categorized into upper and lower

respiratory infections, with the latter bearing a significant burden of the disease and remaining one of the top causes of morbidity and mortality in children in the Philippines (DOH 2022). The burden of lower respiratory infection in the Philippines has been estimated to have reached 1.9 million DALYs, and half of this burden occurred among children under five (IHME 2024). Improved, safe, and clean WASH facilities could have prevented 15% of all acute respiratory infection-related deaths in 2019 (Amsalu, Akalu, and Gelaye 2019; Windi et al. 2021).

An increased risk for these diseases may also be attributed to climate change because of changes in the quality of water sources and the frequency of natural disasters that might contaminate water supplies. The Philippines, which is climate vulnerable and the third most disaster-prone nation globally, experiences high temperatures and abundant rainfalls in a year. These events can contaminate water sources with sewage, pathogens, and pollutants, heightening the risk of infections and diseases (Levy, Smith, and Carlton 2018).

Population's access to water, sanitation, and hygiene

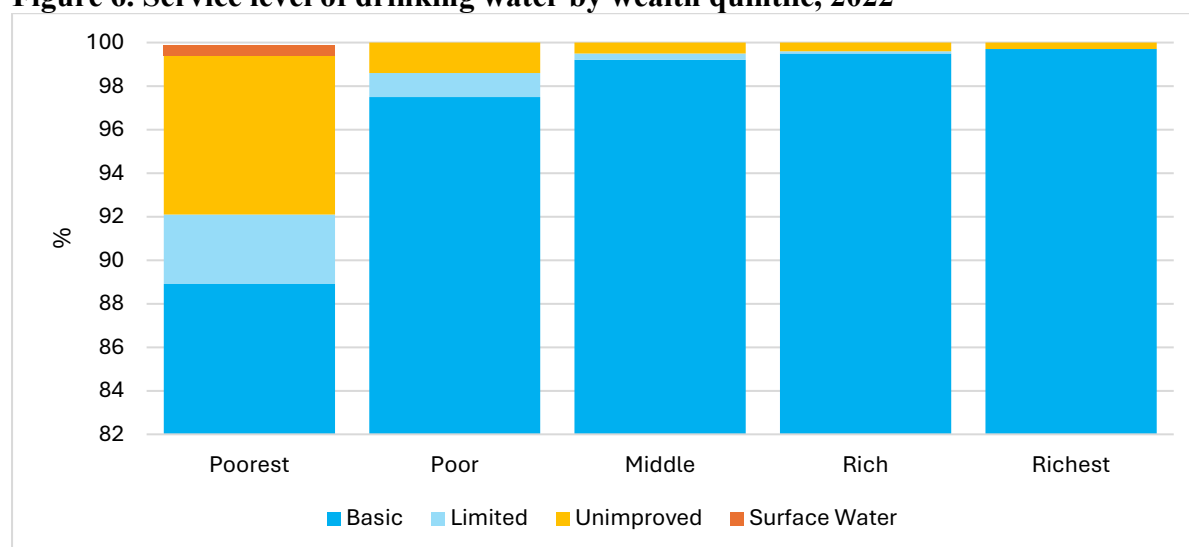
In today's society, WASH services are essential. However, achieving universal coverage remains a challenge in the Philippines. The longstanding issue of WASH in the Philippines underscores the “last mile” challenge: the difficulty in delivering essential services to the poorest population and areas to attain a universal coverage.

Water

Access to improved water sources refers to safe and clean drinking water that meets quality standards. It is crucial for public health because it helps prevent waterborne diseases and supports overall hygiene.

Access to potable water in the Philippines has a socio-economic gradient, as only 90% of households in the bottom wealth quintile are able to avail of improved sources compared to almost 100% of the top 20% wealth quintile (Figure 6). About 8% of the poorest 20% even lack access to clean drinking water (PSA 2022).

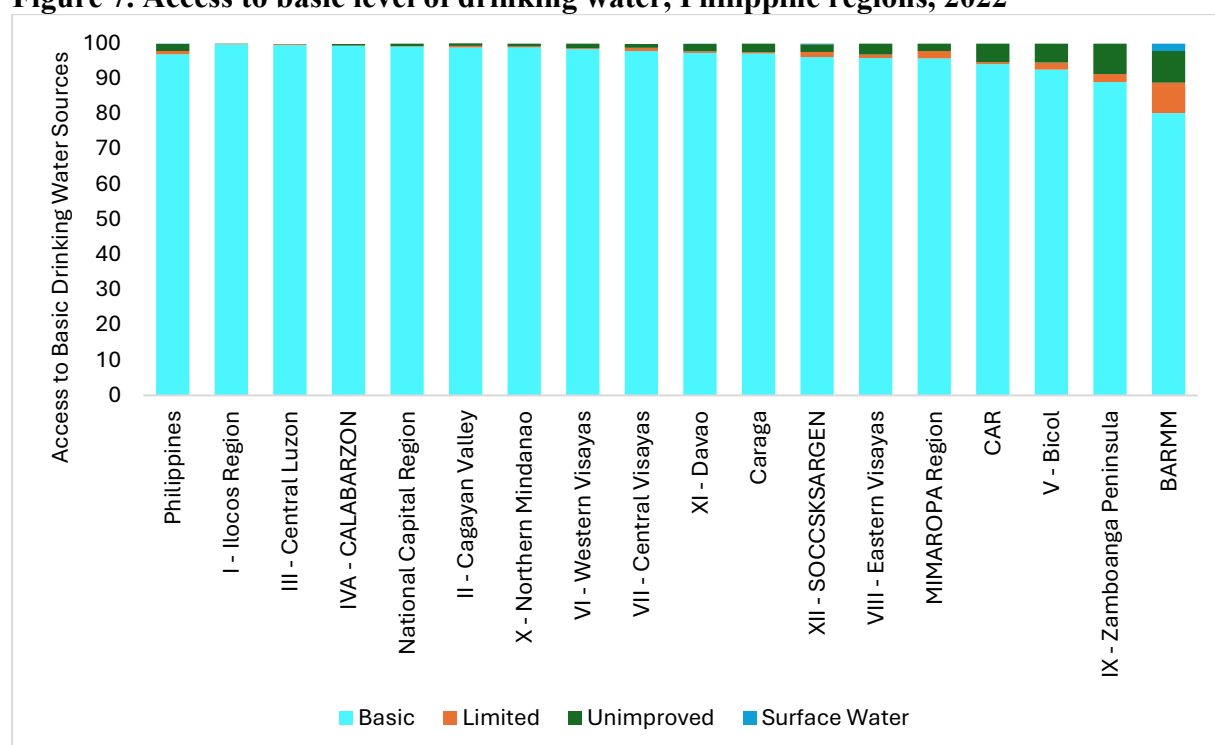
Figure 6. Service level of drinking water by wealth quintile, 2022



Source: Authors' visualization of data from the Philippine Statistics Authority (2022)

In 2022, basic drinking water² was accessible to at least 97% of households in the Philippines, although there were variations in coverage across regions. Ilocos Region exhibited a high access rate to safe water sources while the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM), one of the poorest regions in the country, reported the lowest access rate. The 20-percentage point gap between BARMM and Ilocos—the region with the lowest and highest access to potable water, respectively—emphasizes this disparity (Figure 7).

Figure 7. Access to basic level of drinking water, Philippine regions, 2022



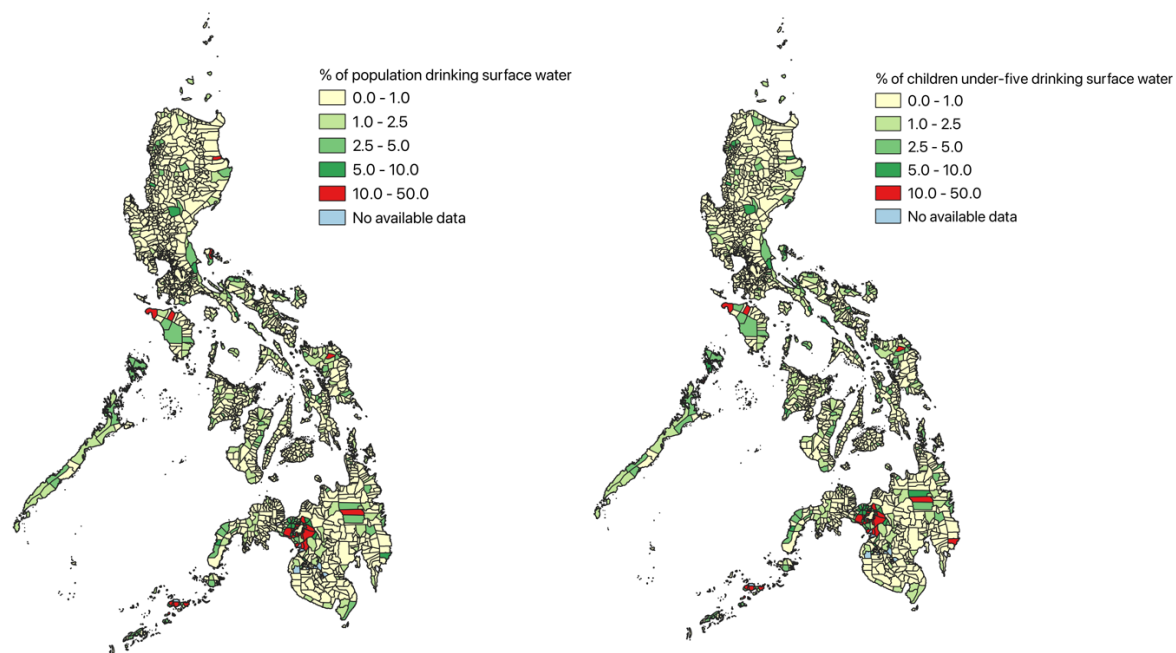
Source: Authors' visualization of data from the Philippine Statistics Authority (2022)

Note: BARMM = Bangsamoro Autonomous Region in Muslim Mindanao; CALABARZON = Cavite, Laguna, Batangas, Rizal, and Quezon, and one highly urbanized city; MIMAROPA = Mindoro, Marinduque, Romblon, and Palawan; SOCCSKSARGEN = South Cotabato, Cotabato, Sultan Kudarat, Sarangani, and General Santos City.

Although the overall percentage of the Philippine population accessing surface or unsafe water remains low at around <1%, there are resource-constrained areas where a bigger rate of their population drinks unsafe water. Of the total population and children under five in select BARMM and MIMAROPA municipalities, 10-50% still drink surface water (Figure 8).

² Safely Managed = an improved water source that is accessible on premises and free from fecal and priority chemical contamination; Basic Drinking Water = an improved water source with no more than 30 minutes for a roundtrip collection including queuing; Limited = an improved water source for which could exceed to 30 minutes for a roundtrip collection including queuing; Unimproved = water source from an unprotected dug well or unprotected spring; Surface Water = water sources and drink directly from a river, dam, lake, pond, stream, canal or irrigation canal.

Figure 8. Percentage of population and children under five drinking surface water, by city/municipality, Philippines 2020

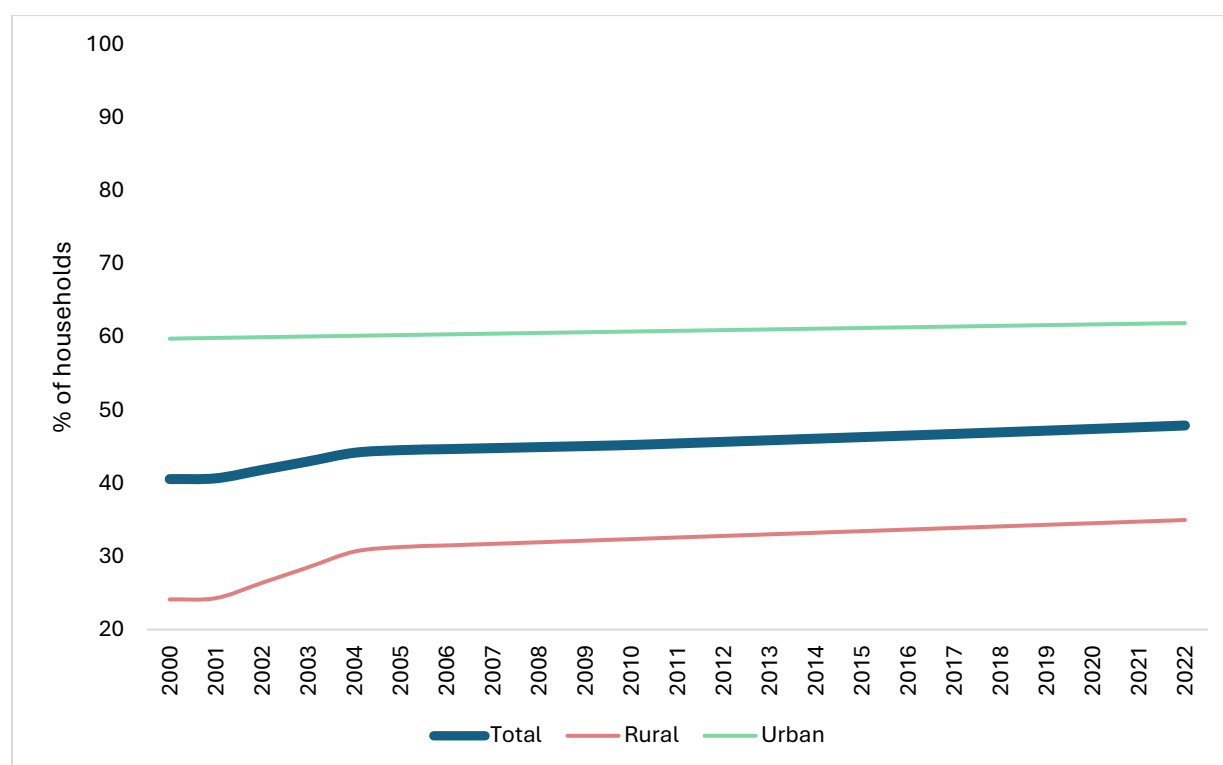


Source: Authors' analysis of Census of Population and Housing 2020 (PSA 2020)

While a huge part of the Philippines has access to basic water services, SDG 6 calls for providing safely managed water services for everyone in all settings. The country has been on an upward trajectory, albeit gradually—i.e., averaging an increase of less than 1% annually since 2000—in terms of access to safely managed water sources over the years. Given this rate, the availability of safely managed water sources remains elusive to half of the Philippine population in 2022.

The inability of certain locations to access safe water has been associated with the urban-rural disparity, with millions of Filipinos in poor regions enduring unsafe water conditions. Rural populations have access to barely half of what urban populations have (Figure 9).

Figure 9. Access to safely managed water sources, Philippines, 2022



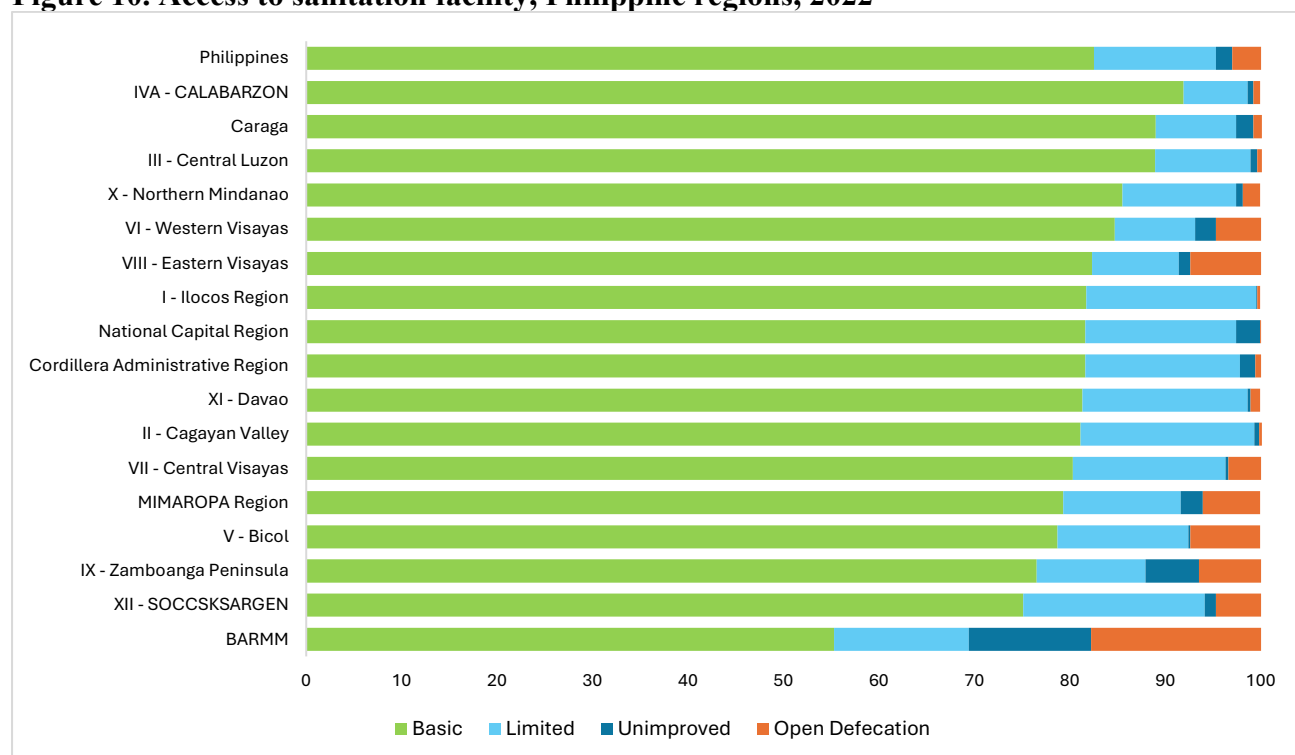
Source: Authors' visualization of data from WHO and UNICEF Joint Monitoring Program

Sanitation

Sanitation facilities include structures such as toilets and latrines and waste management systems for proper and safe disposal of human excreta. Access to sanitation facilities is critical for disease prevention, maintenance of hygienic conditions, and overall well-being. In 2022, only 83% of Filipino households have access to basic sanitation facilities, and disparity exists across regions (Figure 10). In BARMM, about 20% of households still practice open defecation, which presents considerable public health risks due to environmental contamination and the spread of waterborne diseases. UNICEF data estimated that access to safely managed sanitation services³ was experienced by only half of Philippine households in 2022 (WHO and UNICEF JMP 2024).

³ Safely managed sanitation services refer to the use of improved facilities that are not shared with others and where excreta are safely disposed of onsite or removed and treated offsite (Cominetti et al. 2024, p.2).

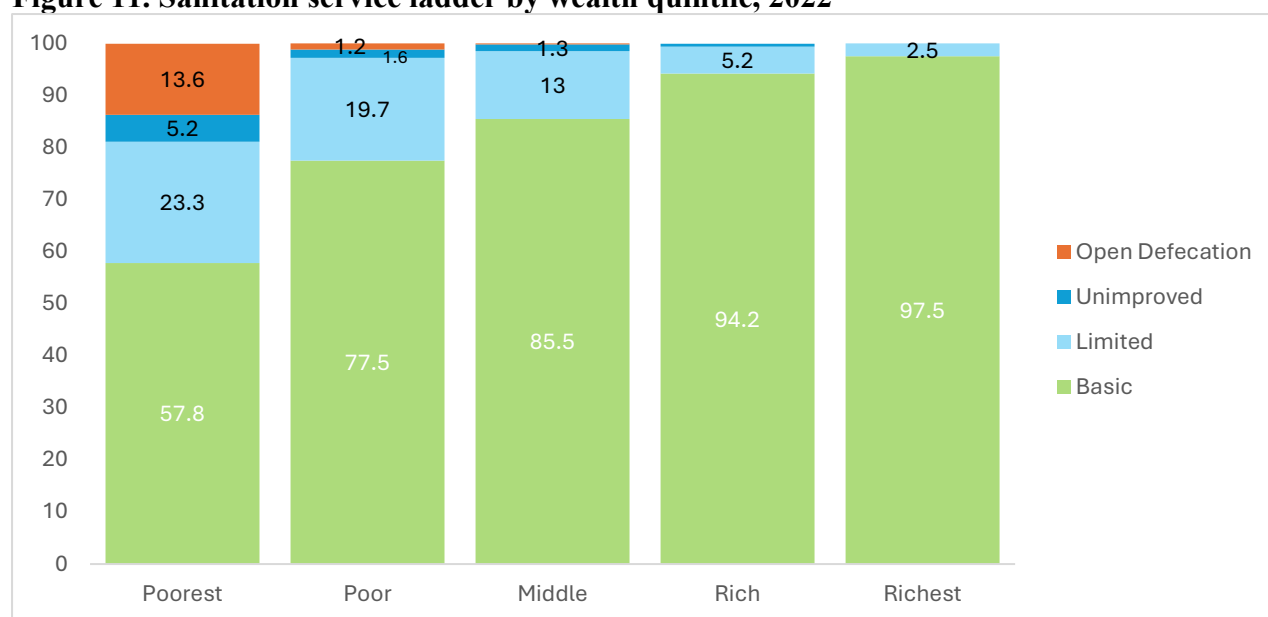
Figure 10. Access to sanitation facility, Philippine regions, 2022



Source: Authors' visualization of data based on National Demographic and Health Survey 2022 from the Philippine Statistics Authority

There, too, is a socio-economic disparity in access to sanitation facilities. Almost all households from the richest quintile have access to basic sanitation facilities, while only 58% of households in the bottom wealth quintile have the same privilege (Figure 11).

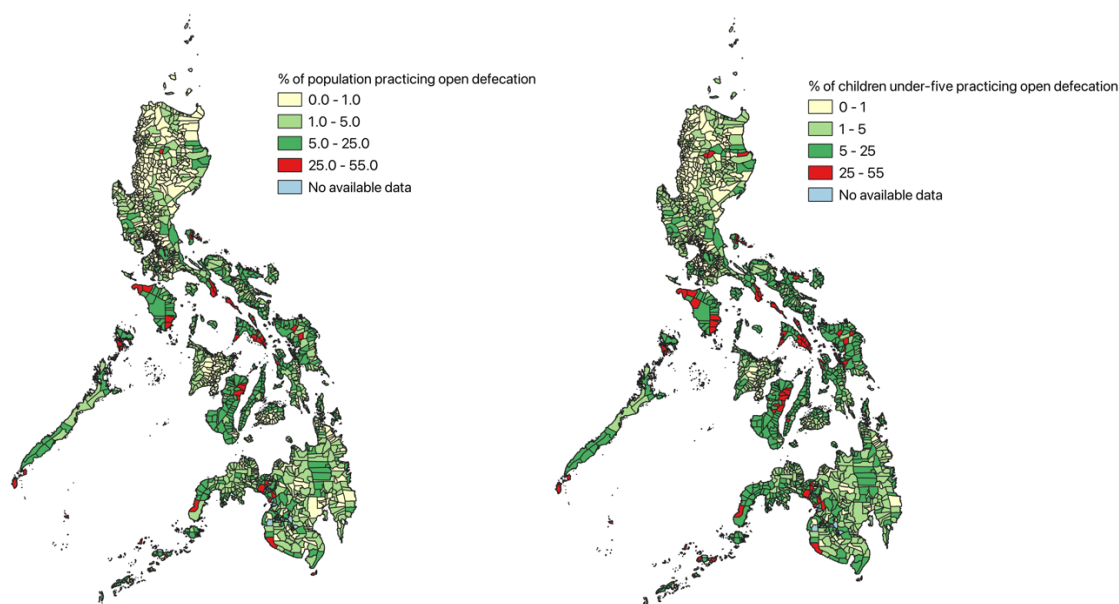
Figure 11. Sanitation service ladder by wealth quintile, 2022



Source: Authors' visualization of data on National Demographic and Health Survey 2022 from the Philippine Statistics Authority

When disaggregated further by cities/municipalities, a large disparity is seen in the percentage of the population and children under five with access to safe sanitation facilities (Figure 12). In fact, in some cities/municipalities in Quezon, Masbate, Samar, Negros, Lanao, Basilan, Sulu, Mindoro, and Palawan, approximately 4 in 10 children under five are practicing open defecation. These areas are usually far-flung and not consistently reached by the usual health and nutrition services.

Figure 12. Percentage of the population and children under five practicing open defecation



Source: Authors' analysis of Census of Population and Housing 2020 (PSA 2020)

While 2% of households use unimproved toilet facilities, many facilities accessible to low-income communities are shared (i.e., limited sanitation facilities). (Heijnen et al. 2015) argued that communal sanitation facilities are unclean and more likely to include excrement and flies, which are factors linked to a higher risk of illness. Less usage of restrooms leads to the practice of defecating elsewhere.

Sharing sanitation facilities is often the only option for most low-income residents (Heijnen et al. 2015). Thus, despite data showing increased availability of improved facilities, sanitation-related illnesses, particularly the high incidence of diarrhea, persist.

The Department of Health (DOH) has taken the initiative to align with global WASH initiatives through various programs and to set national targets. Aside from ensuring that 97.48% of all households will have access to safely managed water by 2028, the National Sustainable Sanitation Plan (NSSP) aims for universal access to basic sanitation services during the same period. One of the programs under the NSSP is the Zero Open Defecation Program, which uses the Community-Led Total Sanitation approach to end open defecation.

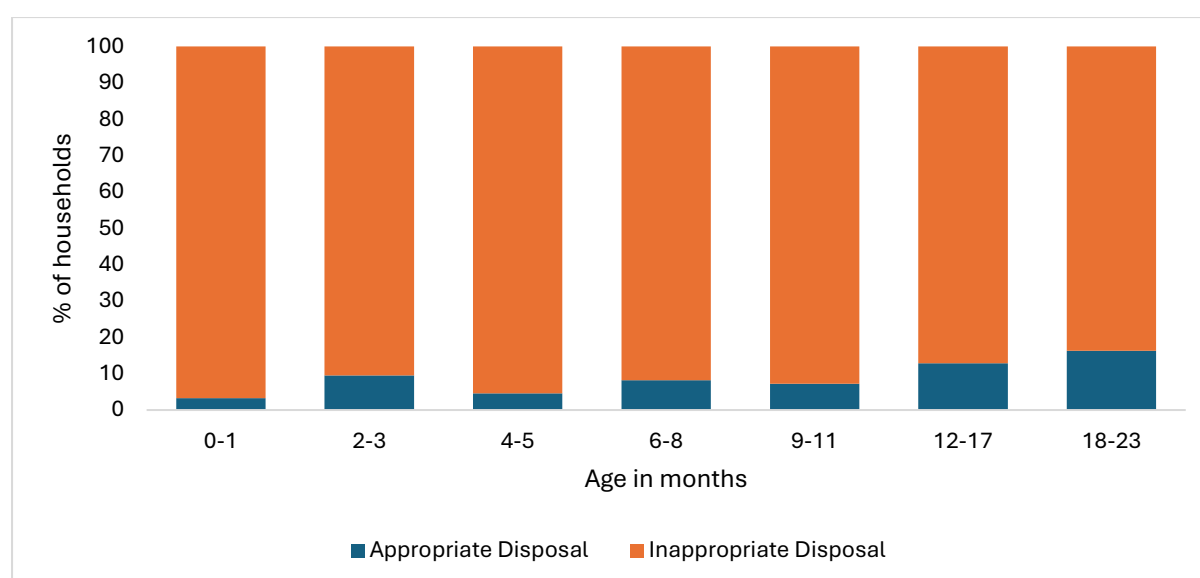
The country is still far from reaching zero open defecation (Department of Health 2019). Only 33% of barangays in the country have received certification that they no longer practice open defecation. Meanwhile, at the city or municipal level, only 43.02% have achieved a municipal-

wide zero open defecation status, which is just half of the 2023 target of 80%. To be granted the zero open defecation status, LGUs must meet certain criteria, such as the presence of open spaces, drains, and bodies of water free of human excreta, 100% hygienic toilet usage (with a maximum of 15 users per toilet), and safe disposal of child feces.

Child feces disposal

Many households still report that they practice unsafe disposal of their children's stools. It has been observed that during the first year of a child's life, parents often resort to inappropriate disposal methods for their children's feces. Only less than 20% are managing child excreta properly (Figure 13). Figure 14 shows that the predominant method of disposing children's stools (across age groups) involves throwing them in the garbage (at 70%). Garbage disposal of children's stools is considered neither appropriate nor safe, given the subpar waste management practices in the country (Bain and Luyendijk 2015).

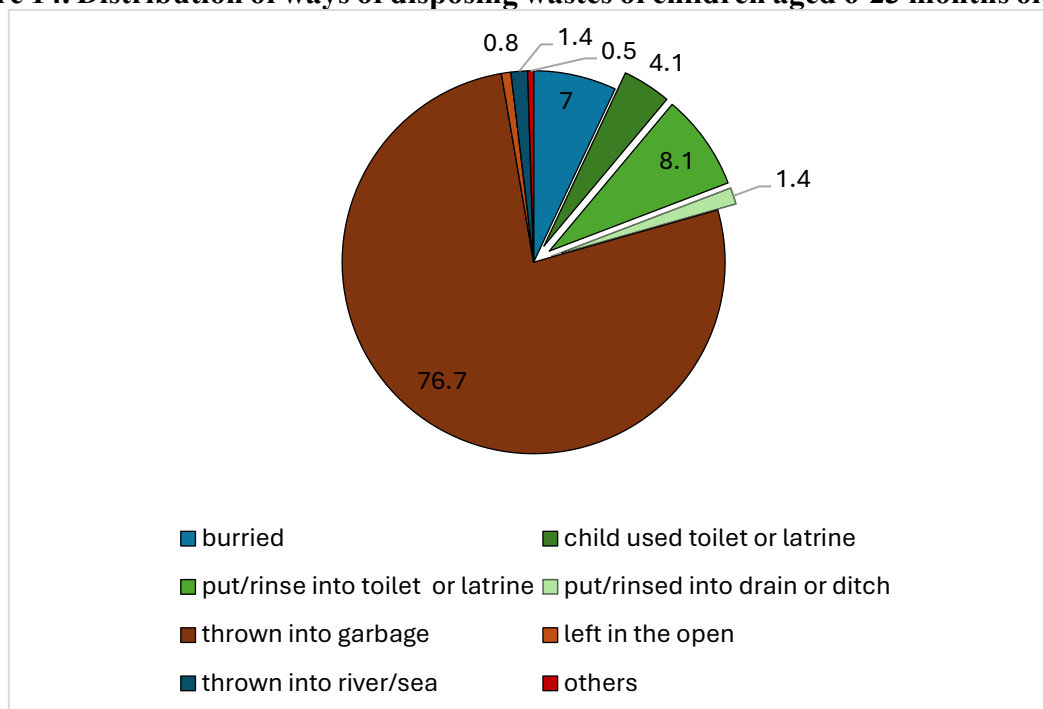
Figure 13. Disposal of children's stool, by age in months, 2022



Note: Appropriate disposal manner includes using toilet or latrine or putting or rinsing stools in toilet or latrine; Inappropriate disposal is one where waste is disposed by burying, putting or rinsing into drain/ditch, throwing into garbage, leaving in open area, and throwing into rivers/seas.

Source: Authors' visualization of National Demographic and Health Survey data from the Philippine Statistics Authority (2022)

Figure 14. Distribution of ways of disposing wastes of children aged 6-23 months old, 2022



Source: Authors' visualization of National Demographic and Health Survey data from the Philippine Statistics Authority (2022)

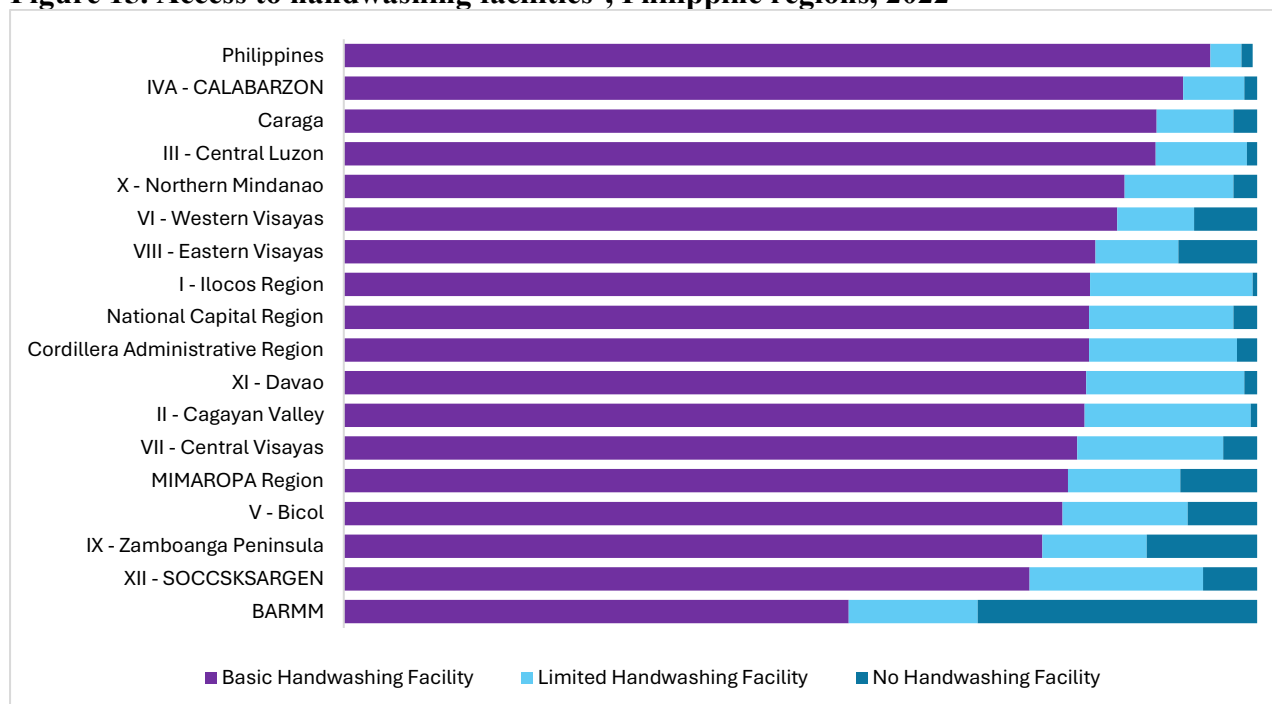
Several studies suggest that children's age influences their own disposal practices. As children grow older, they are more likely to use toilets or latrines themselves, shaping their behavior toward safer disposal of their excreta (Ellis et al. 2020; World Bank 2015).

Handwashing facilities and hygiene supplies

In handwashing facilities, hygiene supplies are likely to be available. In the Philippines, only 2% of those with handwashing facilities do not have available water and soap.

While the country has a large access to handwashing facilities (94%), there is an evident geographical disparity. Within each region, an average of 5% of households lack handwashing facilities. In BARMM, nearly half of the households have limited to no handwashing facilities (Figure 15).

Figure 15. Access to handwashing facilities⁴, Philippine regions, 2022



BARMM = Bangsamoro Autonomous Region in Muslim Mindanao; CALABARZON = Cavite, Laguna, Batangas, Rizal and Quezon, and one highly urbanized city; MIMAROPA = Mindoro, Marinduque, Romblon and Palawan; SOCCSKSARGEN = South Cotabato, Cotabato, Sultan Kudarat, Sarangani and General Santos City.

Source: Authors' visualization of National Demographic and Health Survey 2022 from the Philippine Statistics Authority (2022)

Access to WASH across different settings

In early childhood care and development (ECCD) facilities

Integrating WASH into early learning centers has been a key part of the government's initiatives to enhance child safety and protection. The release of the 2016 Joint Circular Memorandum by the Early Childhood Care and Development Council and the Department of the Interior and Local Government (DILG) underscores efforts to address hygiene knowledge gaps in early learning centers and improve WASH facility infrastructure.

Children under the age of five are covered by early childhood care and development (ECCD), which encompasses the initial phase of their transition to school. Children in this age group are particularly vulnerable to diseases related to poor and unsafe WASH, such as diarrhea and respiratory infections (IHME 2024). Thus, ensuring that WASH facilities are present across all settings, including child development centers, can significantly reduce risks of infections and diseases (Abrigo et al. 2019; Melariri et al. 2024; Tofail et al. 2018).

Despite efforts to ensure children's access to safe WASH, approximately 20,000 early learning centers still lack essential facilities in 2023. Nearly 30% of these centers do not have access to

⁴ "Basic service" is the availability of a handwashing facility with soap and water at home. "Limited" is the availability of a handwashing facility lacking soap and/or water at home. "No facility" refers to no handwashing facility on the premises (WHO UNICEF Joint Programme n.d., par.4).

clean water, functional toilets, handwashing facilities with soap, and deworming programs (Table 1). Some WASH interventions need to be prioritized in early learning settings to safeguard the health and well-being of the young.

Table 1. Access to important WASH facilities in ECCD centers

Indicator	% of ECCD Centers
Water	
Safe water for drinking, handwashing, and tooth brushing within the facility	68.57%
Proper drainage for wastewater	65.30%
Sanitation	
Functional sanitary toilet	71.63%
Hygiene	
Available soap, toothpaste, and toothbrush for hygiene activities	69.26%
Functional handwashing facility	64.13%

Note: ECCD-IS data is dependent on the encoding capacity of the local government units (LGUs). The dataset used is as of September 2023, with data from around 84% of the LGUs. Only 74% of the LGUs that utilized the ECCD-IS in 2023 encoded data on WASH in ECCD for their localities. Thus, these numbers may be an underestimation of the overall access to WASH in ECCD facilities.

Source: Authors' analysis of Early Childhood Care and Development Information System (ECCD-IS) data from the Department of Social Welfare and Development (2023)

In schools (DepEd WinS program)

Inadequate access to water supply and poor sanitation and handwashing facilities are not limited to homes or communities; such deficiency also beset school premises.

Studies suggest that WASH in schools programs positively impact child health, including reductions in diarrheal disease and other hygiene-related illnesses (McMichael 2019; Sangalang et al. 2022; Vally et al. 2019). The presence of safe WASH facilities in schools also stimulates children's own knowledge of and behavior toward proper hygiene practices from an early age.

DepEd Order Number 10, series of 2016, also known as the WASH in School (WinS) Program, is the established policy that provides the national standards for WASH in Schools. To fulfill these standards, the DepEd utilizes the Three Star Approach (TSA)⁵ as the implementing scheme for the operational standards, and monitoring and evaluation of WASH facilities in schools.

The WinS program is effective, according to studies (Sangalang et al. 2022). Participating schools in the WinS Program have been shown to have safer and cleaner water facilities, functional and private toilets, and proper waste management compared to non-participating schools (Vally et al. 2019). These improvements in WASH facilities have translated into better student hygiene knowledge and behaviors. For instance, handwashing with water and soap after using school toilets for defecation is more commonly observed among students from WinS-

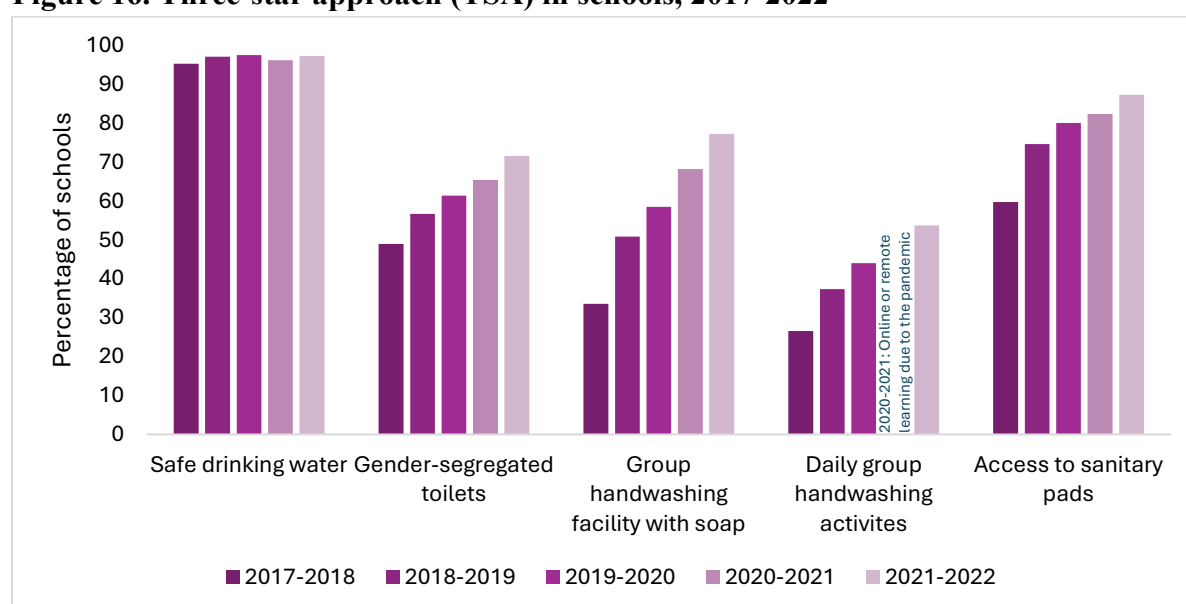
⁵ Three Star Approach (TSA) is a method to ensure a healthy and protective learning environment by improving the effectiveness of hygiene behavior change programs in schools (UNICEF and GIZ 2013). The TSA measures five crucial areas – safe drinking water, gender-segregated toilets, group handwashing facility with soap, daily group handwashing activities, and access to sanitary pads – to monitor the behavioral change in students based on the presence or absence of these indicators.

participating schools (Vally et al. 2019). More importantly, students from WinS schools are less likely to be absent due to WASH-related diseases such as diarrhea.

The TSA in Philippine schools focus on five crucial indicators. Due to a combination of interventions, such as encouraging students to bring water bottles to schools or purchase purified water from water stations; and accessing piped-in potable water from water districts or concessionaires, nearly all schools now demonstrate that they have easy access to drinking water.

However, other indicators fall short of the targets (Figure 16). Regular group handwashing continues to be the most difficult criterion for schools to meet as only about half of these schools incorporate this parameter. Aside from its cost-effective advantage, group handwashing—when practiced regularly—can improve children's hygienic behavior by fostering it as a social activity and a habit that extends beyond school (UNICEF and GIZ 2016).

Figure 16. Three-star approach (TSA) in schools, 2017-2022



Source: Authors' visualization of data from the Department of Education (2022)

Adolescent girls' health in schools

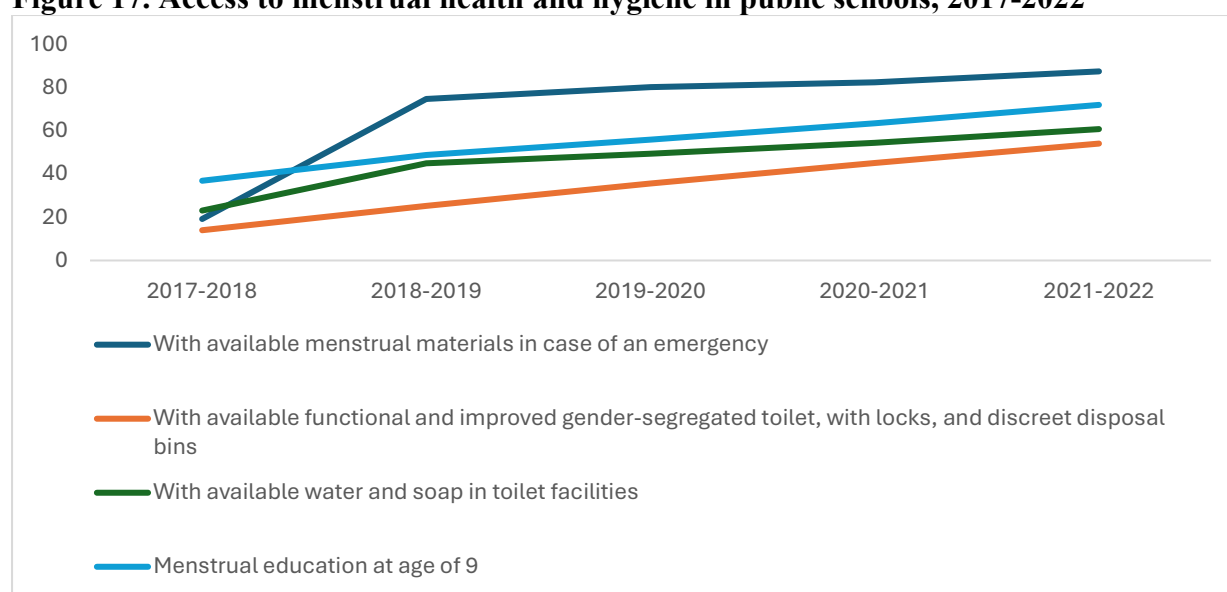
Within school settings, WASH facilities play a crucial role in supporting the menstrual health and hygiene of girls. Research from various countries has highlighted the challenges girls face during their monthly cycle, including stress, anxiety, confusion, and embarrassment stemming from a lack of menstrual knowledge and the stigma surrounding menstruation (Mason et al. 2023; Sommer and Sahin 2013).

In the Philippines, schoolgirls' menstrual experiences are further compounded by inadequate access to (a) clean water; (b) clean, functional, and private toilet facilities; and (c) hygiene and menstrual materials within schools (Ellis et al. 2016).

Research indicates that the obstacles to safe menstrual health management (MHM) often lead girls to skip school and display low engagement in the classroom, which can affect their learning and development. Also, in the absence of private and clean toilets, young women tend to change menstruation pads less frequently and may have no other option but to defecate in a public place, both of which carry health risks to themselves and to other people (Ellis et al. 2016; Sommer and Sahin 2013). Thus, the overall health and experience of young women of reproductive age, including adolescent girls, can affect their long-term knowledge and health status, which can then influence their behavior as future mothers and, consequently, the growth and development of their would-be children.

The integration of MHM in school programs aims to ensure the safety and comfort of schoolgirls by enhancing WASH facilities in schools (UNICEF and GIZ 2016). Over the past five years, the suitability of schools for safe MHM had been monitored (Figure 17).

Figure 17. Access to menstrual health and hygiene in public schools, 2017-2022

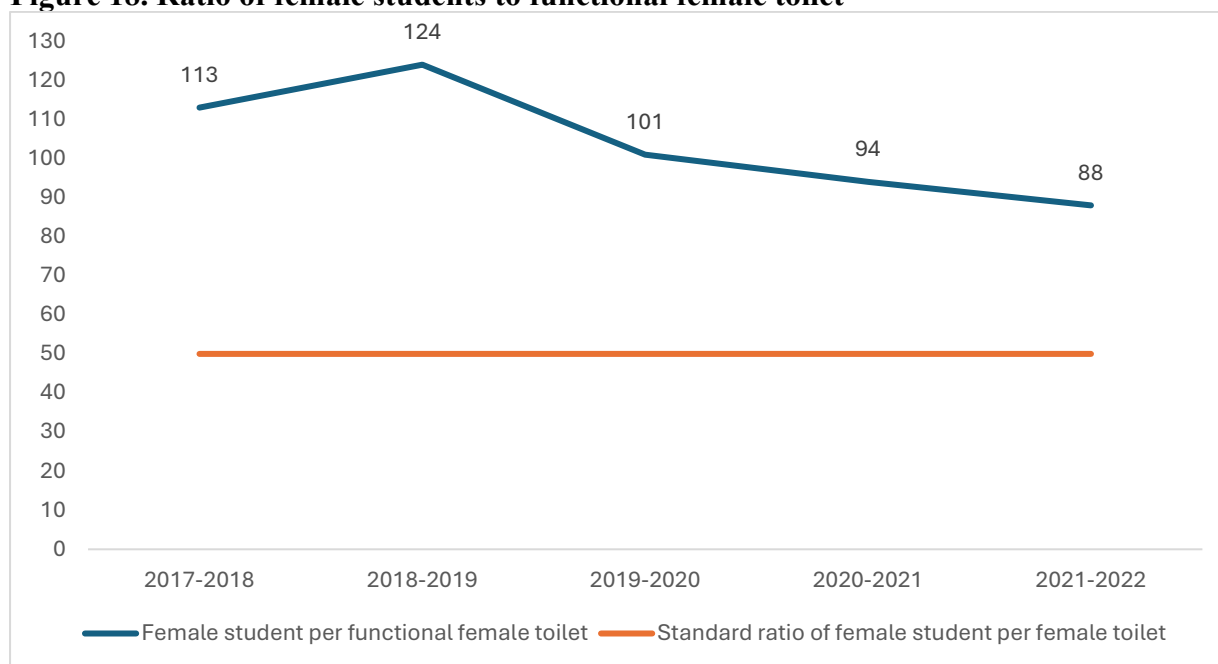


Source: Authors' visualization of data from the Department of Education (2022)

From the baseline data in 2017–2018, the numbers have more than doubled across all indicators by 2021–2022. While there has been a positive trend toward integrating MHM into schools, the numbers on the improved sanitation facilities and hygiene materials remain low.

Moreover, the female student-to-toilet ratio is high, exceeding the recommended ratio of 50 schoolgirls per functional toilet. However, the ratios, as seen in Figure 18, have been decreasing since 2017. This may imply that although more facilities had been built, the increase in the number of facilities could still not catch up with the rise in the number of students.

Figure 18. Ratio of female students to functional female toilet



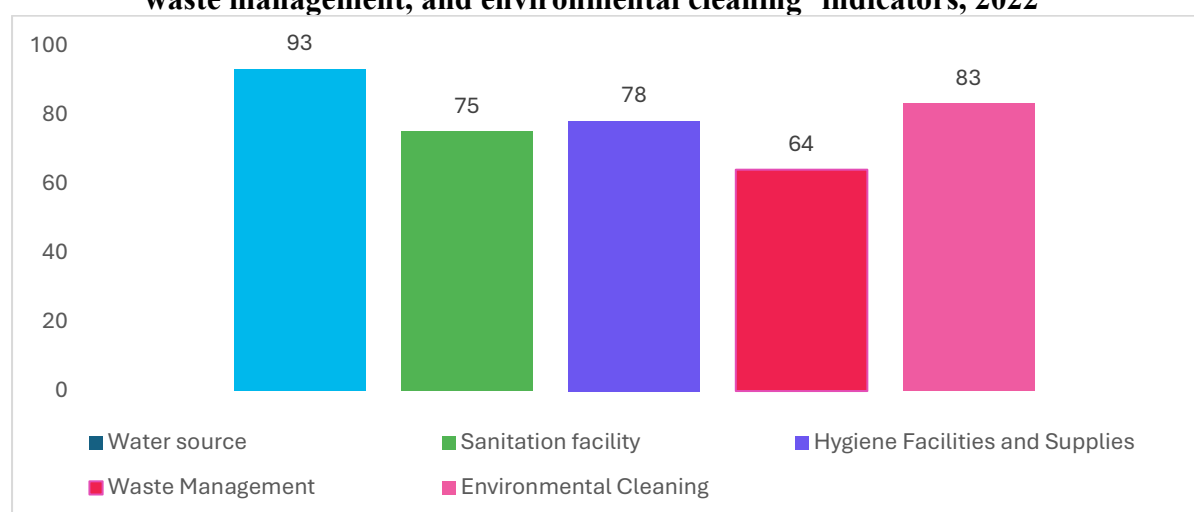
Source: Authors' visualization of data from the Department of Education (2022)

In healthcare facilities

There have been evidences of how WASH in healthcare facilities can protect the health of mothers and newborns (Flynn et al. 2017; UNICEF 2019). Provision of safe and functional WASH services in healthcare facilities prevent maternal and newborn deaths and the spread of infections. Women's desire to give birth at home is influenced by subpar WASH conditions in hospitals, which puts the mother and the newborn's health at risk, too (Bouزيد, Cumming, and Hunter 2018).

While most healthcare facilities have high access to basic water service and environmental cleaning indicators, there are significant gaps in sanitation, hygiene, and waste management (Figure 19). These disparities highlight areas where further improvement and investment are needed to meet the required WASH standards. The situation is particularly dire in primary healthcare facilities, which are often the first point of care, especially for those living in rural areas (WHO 2015).

Figure 19. Access of healthcare facilities to basic-level water service, sanitation, hygiene, waste management, and environmental cleaning⁶ indicators, 2022



Note: These are unpublished data from DOH based on the reported number from Water and Sanitation for Health Facility Improvement Tool (WASH FIT).

Source: Authors' visualization of data from Department of Health (2022)

Water Supply and Sanitation Systems of the Philippines

Water infrastructure and delivery systems

In the Philippines, the responsibility of meeting the population's water supply needs lies with the water service providers (WSPs), each of which operates under different management structures and falls under one of three water service levels. Each water service level can be categorized by how households access their water: whether through a designated point source, a public/communal faucet, or a private faucet (Table 2).

Table 2. Modes of water delivery

Service Level	Source of Water	Water Source Classification	Safety Classification
Level III	Own Faucet Community Water System Own Tube/Piped Deep Well	Waterworks System / Individual Piped Connections	Safe source
Level II	Shared Faucet Community Water Shared Tube/Piped Deep Well Piped Shallow Well	Public / Communal Faucet	
Level I	Protected Spring, River, Stream, etc.	Point Source	
	Unprotected Spring, River, Stream, etc. Dug Well Lake, River, Rain, and Others Peddler Others	Point Source	Unsafe Source

Source: (NEDA 2021)

⁶ In the context of healthcare facilities, basic waste management involves segregating waste into at least three bins and ensuring that sharps and other infectious materials are treated and disposed of safely. Basic environmental cleaning requires that cleaning protocols are in place and that all staff responsible for cleaning have received proper training.

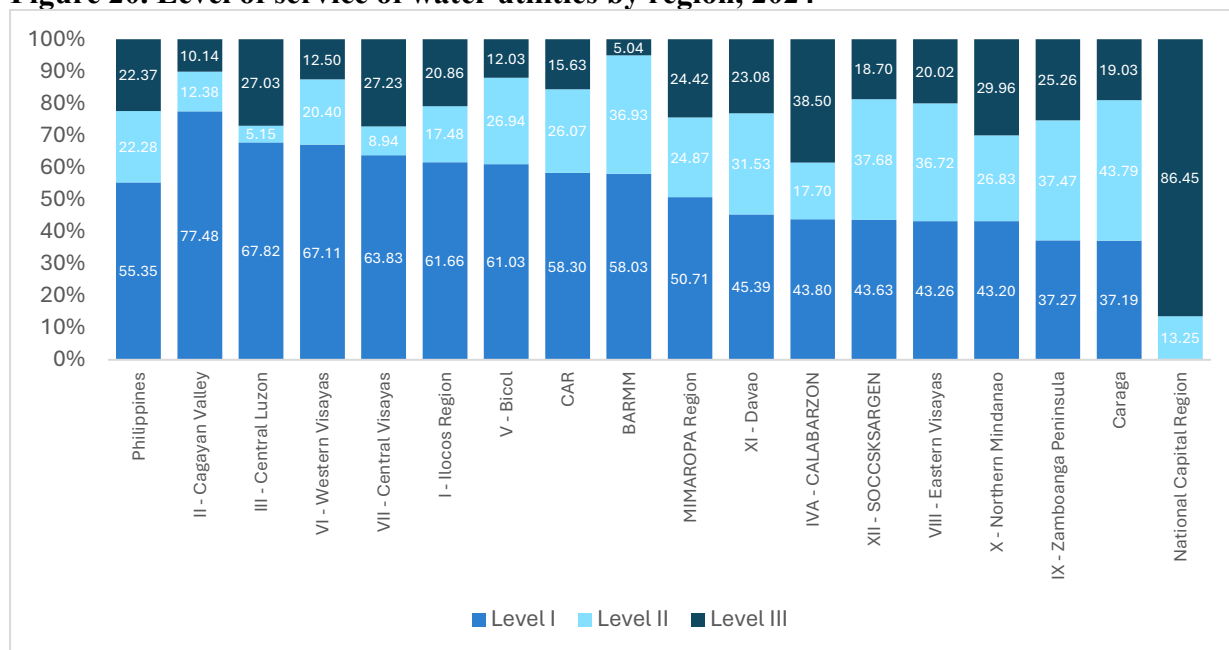
However, based on the survey of the National Water Resources Board, the majority of water utilities are supplying water through Level I service, which are mostly unsafe sources (Table 3 and Figure 20). Only 45% come from safe sources, with 23% sourced from waterworks and 22% from shared communal faucets.

Table 3. Number of water systems by water service provider

MANAGEMENT TYPE	TOTAL NO. OF WSPs		LEVEL OF SERVICE		
	NO.	%	LEVEL I	LEVEL II	LEVEL III
COMMUNITY-BASED ORGANIZATIONS	9,859	34%	4,037	3,456	2,362
Barangay Waterworks and Sanitation Association	7,915	28%	3,923	2,714	1,274
Rural Waterworks and Sanitation Association	1,542	5%	68	658	816
Cooperative	402	1%	46	84	272
PRIVATE UTILITIES	13,220	47%	10,351	1,124	1,736
Unnamed Water Service Provider	8,861	31%	8,048	593	212
Homeowners' Association	391	1%	170	78	143
Real Estate Developer	167	1%	7	8	152
Industrial Locator	49	0%	3	4	42
Peddler	342	1%	174	132	36
Ship Chandler	4	0%	1	2	1
Other Private Operators	2,150	8%	760	267	1,123
Refilling Stations	1,256	5%	1,188	40	27
LGU RUN UTILITY	4,439	16%	1,211	1,703	1,522
WATER DISTRICT	723	3%	21	5	695
Grand Total	28,241	100%	15,620	6,288	6,315

Source: National Water Resources Board's Listahang Tubig as of April 2024

Figure 20. Level of service of water utilities by region, 2024



BARMM = Bangsamoro Autonomous Region in Muslim Mindanao; CALABARZON = Cavite, Laguna, Batangas, Rizal and Quezon, and one highly urbanized city; MIMAROPA = Mindoro, Marinduque, Romblon and Palawan; SOCCSKSARGEN = South Cotabato, Cotabato, Sultan Kudarat, Sarangani and General Santos City.

Source: Authors' illustration on data from the National Water Resources Board 2024 Listahang Tubig

Table 3 details the management types and service levels of water service providers (WSPs). Approximately 34% of WSPs function as community-based organizations. These include the Barangay Waterworks and Sanitation Association established in 1989 to maintain water facilities in villages.

The emergence of community water service providers, managed by cooperatives and associations, is a response to the failure or incapacity of the government—along with that of other central utilities—to connect off-grid and impoverished communities within their service areas (Quiray 2012). One-third (31%) of community water service providers are private and unnamed. They serve at least 15 households, are unregistered, and have no formal management structure or enforced systems. Their unregulated practices, however, could result in the delivery of water that is unsafe or of poor quality. Only 13% of these private providers have water sources from Service Level III.

There are 721 water districts, which account for about 3% of all WSPs in the Philippines. On the other hand, utilities owned and operated by local government units (LGUs) account for 16% of WSPs. It should be noted that only a third of these LGU-run utilities are Level III water systems, raising concerns over the difficulties faced by LGUs despite the substantial support and funding they received for water supply initiatives (Velasco et al. 2020).

Sanitation infrastructure and delivery system

Proper septage and sewerage management systems are essential for treating and safely disposing of wastewater to reduce the pollution load going to bodies of water, including the water sources of the community. Targets to improve sanitation are embodied in sectoral

roadmaps and development framework plans, such as the Philippine Water Supply and Sanitation Master Plan (PWSSMP) and the National Sewerage and Septage Management Program (NSSMP). However, current data show that the country is far from meeting its national septage and sewerage management targets (Table 4).

Table 4. Status vis-à-vis the baseline and targets of the National Sewerage and Septage Management Program targets

Goal		Baseline (2015)	Source	Latest available data		Source	Target
Households with septic tanks		74%	PWSSMP	86.9% HHs used flush to septic tanks		NDHS 2022	97% (2022)
All 17 HUCs have sewerage systems		6% accessed	PWSSMP	8.5% HHs have access to sewerage		APIS 2020	94.12% (2022) 100% (2030)
		3% connected	PWSSMP	4.5% population connected to sewer network		NDHS 2022	20% (2022) 50% (2030)
Population access to septage treatment facilities		41%	PWSSMP	Only 10% of wastewater is treated at the national level		DENR 2019	43.60 million should have access to septage treatment facilities in 2020

APIS = Annual Poverty Indicators Survey; DENR = Department of Environment and Natural Resources; HH = households; HUCs = highly urbanized cities; NDHS = National Demographic and Health Survey; PWSSMP = Philippine Water Supply and Sanitation Master Plan.

Source: Authors' tabulation of data from various resources

The percentage of households with septic tanks is a crucial indicator of improved sanitation, particularly in rural areas where many lack access to even the most basic toilet facilities. While over 80% of households have septic tanks, the majority of these tanks are unmaintained. Most sludge handling systems and disposal facilities are limited in the country; thus, a large part of the collected domestic wastewater is discharged without treatment (NEDA 2021).

Under the NSSMP, LGUs shall share the responsibility in the management and improvement of septage and sewerage systems in their localities. However, in 2022, only less than 10% have access to sewerage systems, which also connotes a very low percentage of access to safely managed sanitation facilities. Meanwhile, the rest of the communities that are not connected to a sewerage network rely on septic tanks and pit latrines, or practice open defecation.

Both septage management and sewerage system services have higher coverage in Mega Manila compared to areas outside the metropolis. The nationwide coverages of both septage management programs (17.8%) and sewerage system services (12.9%), however, remain relatively low (Table 5 and Table 6). The situation is further exacerbated by the significant disparity in coverage rates between Mega Manila and areas outside the National Capital Region, revealing regional inequalities in access to crucial sanitation services. Outside Mega Manila, sewerage systems and wastewater treatment facilities are sparse, resulting in the untreated discharge of wastewater into water bodies, which poses substantial environmental and health risks.

Table 5. Estimated coverage of septage management programs in the Philippines, 2015

Areas	Total Population within Franchise Area	Percentage of the Population within Areas with a Septage Management Program
Mega Manila	14,868,425	14.7%
Outside Mega Manila	3,063,088	3.0%
Total	17,931,513	17.8%

Source: Philippine Water Supply and Sanitation Master Plan 2021

Table 6. estimated coverage of sewerage system services in the Philippines, 2015

Areas	Total Population within Franchise Area	Percentage of the Population within Areas with a Sewerage Management Program
Mega Manila	12,877,253	12.8%
Outside Mega Manila	101,883	0.1%
Total	12,979,136	12.9%

Source: Philippine Water Supply and Sanitation Master Plan 2021

While Tables 5 and 6 are based on PWSSMP data, it is worth noting that these figures are unofficial due to the absence of existing surveys on sanitation service providers outside Metro Manila. Such lack of data underscores the need for more coordinated monitoring efforts to gather updated information on where the country is now with regard to the national targets and on the extent of coverage in septage management and sewerage services.

Challenges surrounding WASH governance in the Philippines

The effectiveness of WASH initiatives relies heavily on well-structured institutional arrangements and effective sector management. However, there are challenges in water governance in the Philippines. The presence of multiple water supply and sanitation agencies (Table 7 and Table 8) leads to overlaps and fragmentation in governance in the water sector that hinder the efficient access to safe water and sanitation facilities (Velasco et al. 2020).

Table 7. Role of government agencies in the WASH sector

Agency	Responsibility
National Water Resources Board (NWRB)	<ul style="list-style-type: none"> In charge of setting, administering, and enforcing all rules related to water, such as control, conservation, and protection of waters, watershed, and related land resources. Manages WSS sector database, including WSP performance data.
Local Water Utilities Administration (LWUA)	<ul style="list-style-type: none"> Acts as specialized lending institution for the promotion, development, and financing of local water utilities. Provides capacity building support to WSPs.

	<ul style="list-style-type: none"> • Provides technical advisory services and financial assistance to water districts. • Provides technical and institutional support to LGUs and WSPs. • Sets design standards for water supplies operated by water districts and other WSPs. • Regulates water districts.
Department of Public Works and Highways (DPWH)	<ul style="list-style-type: none"> • Manages the planning, design, construction, organization, and maintenance of national's septage and sewerage management program. • Coordinates with DepEd and DSWD to ensure that all schools and evacuation centers have appropriate WASH facilities, following DOH-approved sanitation facility designs. • Coordinates with DILG and LWUA to increase the number of LGUs with septage and sewerage facilities.
Department of Environment and Natural Resources (DENR)	<ul style="list-style-type: none"> • Mandate is based on Executive Order 192 (1987), which promulgates the (a) rules and regulations for the control of water, air, and land pollution and (b) ambient and effluent standards for water and air quality. • Leads the implementation of the Clean Water Act.
DENR - Water Resources Management Office	<ul style="list-style-type: none"> • Sets effective implementation of Integrated Water Resources Management aligned with the United Nations Sustainable Development Goals and develops a comprehensive Water Resources Master Plan accordingly. • Coordinates with all the governing bodies with relevant mandates in the water sector. • Generates accurate and up-to-date water and sanitation data to support evidence-driven policymaking, regulatory measures, strategic planning, and implementation.
Department of Health (DOH) Central Office — Disease Prevention and Control Bureau	<ul style="list-style-type: none"> • Leads the coordination and monitoring of the National Environmental Health Action Plan 2030 and the Philippine Approach to Sustainable Sanitation (PhATSS) implementation through the Water Supply, Sanitation and Health Technical Working Group of the national Inter-Agency Committee on Environmental Health (IACEH) or any other relevant sector coordination body. • Reviews and promotes the Philippine National Standards for Drinking Water. • Monitors and responds to water and sanitation-related disasters and waterborne outbreaks. • Reviews and provides environmental sanitation clearance for stationary and mobile septage services, and helps LGUs undergo compliance training with respect to the National Sewerage and Septage Management Program. • Assesses the health impact of WSS programs and projects.
DOH Center for Health Development (CHDs)	<ul style="list-style-type: none"> • Ensures that regional health plans are supportive of the technical assistance requirements of LGUs as indicated in their local WASH sectoral plans.

Department of the Interior and Local Government (DILG)	<ul style="list-style-type: none"> • Supports the conduct of advocacy activities at the LGU level toward effective delivery of basic WASH services. • Participates in local WASH sectoral planning and budgeting at the provincial and city/municipal levels and ensures that sectoral targets and programs are integrated in the LGU's development plans. • Participates in the national and regional IACEH, and inter-sectoral coordinating bodies at the provincial, city/municipal, and barangay level on WASH. • Provides capacity building training to LGUs in the performance of their functions of providing water and sanitation. • Provides and/or supports LGUs to access financing of water supply and sanitation projects.
Department of Education (DepEd)	<ul style="list-style-type: none"> • Provides safe and adequate water supply, toilet, handwashing, and drainage facilities. • Incorporates menstrual health management in schools by providing menstrual materials and safe sanitation facilities. • Conducts regular deworming program and incorporates hygiene and sanitation education. • Provides guidance on achieving specific criteria under G2 and G3 status of PhATSS in relation to the WASH in Schools Program, through its participation in the national and regional IACEH. • Shares the report on the status of WASH in Schools program implementation to the Provincial/City/Municipal WASH Council.
Department of Social Welfare and Development (DSWD)	<ul style="list-style-type: none"> • Encourages LGUs to establish group handwashing facilities in daycare centers. • Promotes the importance of access to appropriate WASH facilities and practices to parents through the Family Development Sessions under the 4Ps program. • Integrates a WASH training module in the standard training for Day Care Workers and advocates for the inclusion of WASH protocols in the current handbook for hygiene practices in daycare centers. • Conducts capacity building activities for DSWD regional, provincial, and municipal counterparts on WASH in ECCD. • Ensures that evacuation centers have appropriate WASH facilities, following the DOH-approved sanitation facility designs.
Metropolitan Waterworks and Sewerage Authority (MWSS)	<ul style="list-style-type: none"> • For water supply and sewerage services in Metro Manila through private water utilities.
National Economic and Development Authority (NEDA)	<ul style="list-style-type: none"> • Coordinates the preparation of national development plan and investment programs. • Formulates sector policies and strategies. • Monitors implementation of policies, programs, and projects.

Inter-Agency Committee on Environmental Health (IACEH)	<ul style="list-style-type: none"> • Ad-hoc committee established by Executive Order. • Is chaired by DOH; co-chaired by DENR. • A multi-agency task force; Is tasked to facilitate a coordinated effort of different government agencies to address environmental health issues.
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4Ps = Pantawid Pamilyang Pilipino Program; ECCD = early childhood care and development; LGU = local government unit;

WASH = water, sanitation, and hygiene; WSP = water service providers; WSS = water supply and sanitation

Source: Authors' compilation and tabulation from available documents

Table 8. Fragmented and overlapping range of functions of Philippine water-related agencies

FUNCTIONAL AREA	N W R B	L W U A	D E N	L G U s	D P W H	D O H	D E P	N I A	N A P O C O R	P A G A S A	M W S S	M D W S	D O T	M M D A	L L D A
Policy Planning	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Data Monitoring	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Scientific Modeling										•					•
Infrastructure and Program Development	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Operations of Water Facilities				•	•			•	•		•			•	
Regulatory Functions	•	•	•	•		•					•				
Financing		•	•	•							•				
Public Relations, Capdev't and IEC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Local RBO Dev't		•													

Note: DENR = Department of Environment and Natural Resources; DILG = Department of the Interior and Local Government; DOE = Department of Energy; DOF = Department of Finance; DOH = Department of Health; DOT = Department of Tourism; DPWH = Department of Public Works and Highways; IEC = information, education and communication; LLDA = Laguna Lake Development Authority; LGUs = local government units; LWUA = Local Water Utilities Administration; MMDA = Metro Manila Development Authority; MWSS = Metropolitan Waterworks and Sewerage System; NIA = National Irrigation Authority; NAPOCOR = National Power Corporation; NWRB = National Water Resources Board; PAGASA = Philippine Atmospheric, Geophysical and Astronomical Services Administration; RBO = rural-based organization.

Source: Adapted with modifications from Rola et al. (2015)

To address the regulatory and technical overlaps, Executive Order No. 22 was issued in 2023. The order establishes the Water Resources Management Office (WRMO) and mandates the new office to provide the overall direction in the water sector and integrate the fragmented responsibilities of various agencies. Meanwhile, LGUs' responsibilities on WASH are guided by the Local Government Code (LGC) of 1991, which aims to empower LGUs to implement devolved activities, including water supply, sewerage, and sanitation services. The devolution

of WASH services is intended to promote local autonomy and enable LGUs to address the specific needs and priorities of their communities.

While devolution has provided opportunities for local empowerment, there are areas for improvement. As basic education remains centralized, DepEd solely oversees WASH services within schools. While the LGC emphasizes the responsibility of LGUs for delivering WASH services to child development centers, it has not actually translated to adequate WASH services in these centers. The service standards for schools and ECCD programs are consistent but the different approaches to delivering these services—with schools being centrally managed and ECCD programs being LGU managed—result in a disconnected system that affects the quality and consistency of service delivery across these two settings. Also, the absence of three critical elements—i.e., a graduated programming monitoring system, an accountability mechanism, and a performance assessment system—precludes the complete alignment of WASH activities in schools and ECCDs.

The Mandanas ruling, implemented in 2021, further empowers LGUs to carry out their mandates now that local governments are entitled to a higher share of national taxes as stipulated in the LGC. That is, LGUs can appropriate not less than 20% of their annual national tax allotment to their Local Development Fund, which should target development projects (DBM n.d.). Hence, local authorities can, in theory, now expedite infrastructure projects and scale up WASH programs to address existing service gaps.

A simulation study by the World Bank, however, found that Philippine LGUs are not yet fully equipped to assume complete responsibility for WASH development. The simulation revealed that despite the augmented allocation due to the Mandanas ruling, the necessary investment to bridge the gaps in access to safe water and sanitation services would still surpass 50% of the estimated water supply and sanitation budget of LGUs, assuming a 30% utilization of the Local Development Fund (World Bank 2023). Hence, LGUs alone are unable to meet universal water and sanitation targets and would require support in the provision of safe water supply and sanitation services from the national government. Moreover, LGUs' public spending on health accounts for only 20% of the total health expenditure. A significant portion of public health funds is unallocated by LGUs, despite the devolution of health services being mandated and increased funding being made available (World Bank 2015).

All these governance-related challenges stem from the fragmented institutional arrangement, ineffective fiscal management, and conflicting coordination structures of the WASH sector in the Philippines. The prioritization and effective operation of WASH services requires collaboration among the national government, local authorities, public entities (e.g., schools), and the private sector, underpinned by clear regulatory frameworks and a well-defined funding policy (Abrigo et al. 2019).

Conclusion

Despite economic growth over the years, waterborne diseases continue to be one of the leading causes of morbidity and hospitalization, especially among the poorer population. While access to improved water and sanitation facilities has seen significant progress, much still has to be done to achieve universal coverage of safely managed WASH services across all settings—schools, child development centers, health facilities, and households. The last mile challenge in WASH is particularly evident in the poorest regions, such as BARMM, where even basic water and sanitation services are lacking. The socio-economic disparities in the incidence of diarrhea in the country and the inadequate access to WASH facilities highlight the need to improve healthcare services for vulnerable populations.

This chapter's review of the water supply and sanitation systems brings to the fore the differences in water sources' safety levels across the different management types of WSPs. In areas where water facilities are widely available, most are sourced from Service Levels I and II water systems, which often do not have management structures in place, thus putting the quality of the water supply at risk. Meanwhile, in the area of governance, the overlap in regulatory authorities and the fragmented decision-making in the WASH sector affect the efficiency of services.

Potential directions to address existing challenges and accelerate progress

- There is a critical need for targeted interventions, funding, and policies that ensure universal access to WASH facilities, particularly among the poor. This may involve strategic investments in infrastructure, with a focus on regions and communities facing the most significant disparities. Also, the national and local governments should come together, set up strategic plans, and coordinate their activities for the efficient utilization of resources.
- To mitigate the health implications associated with inadequate WASH services, there should be a concerted effort to improve healthcare services, especially for vulnerable populations such as children. This includes prioritizing preventive measures, such as the promotion of handwashing and the provision of essential healthcare interventions for diseases linked to poor WASH conditions, particularly childhood diarrhea.
- Because there are regional and socio-economic disparities in the access to WASH services, initiatives should be tailored toward the specific challenges faced by different communities. Projects and activities should take into consideration the variations in resources, infrastructure needs, and cultural contexts of communities to ensure effective and sustainable improvements.
- The engagement of the localities in the planning and implementation of WASH initiatives should be enhanced to ensure that solutions are customized to their needs and to specific contexts.

- A robust and integrated monitoring and evaluation system for WASH is needed to easily track progress vis-a-vis the targets and objectives and identify gaps for possible intervention.
- Issues in the management of water supply and sanitation systems must be addressed to enhance the efficiency and effectiveness of services. For instance, arrangements among regulatory agencies need to be streamlined to avoid overlaps in oversight functions. Clear standards and criteria for the number of water systems in LGUs should be established.

In sum, a comprehensive and integrated approach encompassing infrastructure development, behavioral change, targeted interventions, and streamlined governance is essential to address the diverse challenges in the delivery of WASH services.

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