

## Scaling Up Rural Sanitation and Hygiene

# Management of Child Feces: Current Disposal Practices

June 2015

## INTRODUCTION

Safe disposal of children's feces is as essential as that of adults' feces. The Joint Monitoring Program for Water Supply and Sanitation (JMP) tracks progress toward the Millennium Development Goal 7 target to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. The JMP standardized definition for an improved sanitation facility is one that hygienically separates human excreta from human contact.<sup>1</sup> The latest JMP report stated that 64 percent of the global population had access to improved sanitation in 2012.<sup>2</sup> This means that 2.5 billion individuals lacked improved sanitation; of these, 1 billion practiced open defecation. However, these estimates are based on the household's primary sanitation facility, and may overlook the disposal practices of young children feces. In many cases, children may not be able to use an improved toilet or latrine—because of their age and stage of physical development or the safety concerns of their caregivers—even if their household has access to one.

## PROBLEM STATEMENT

Although the impact of poor sanitation and hygiene is often measured by the effects on children, most sanitation and hygiene interventions target adults. In order to reach

## KEY FINDINGS

- In most countries analyzed, over 50 percent of households with children under age three reported that the feces of their children were unsafely disposed.<sup>3</sup>
- Even among households with improved toilets or latrines, some unsafe child feces disposal behavior was reported.
- In almost every country, feces of children under age three are less likely to be safely disposed of than those of the general population.
- Higher rates of unsafe child feces disposal were found in poor, rural households with the youngest children and where other household members defecate in the open.
- Although there is a common belief that children's feces are not harmful, exposure to children's feces could be more risky than exposure to adults' feces.

### WHAT IS "SAFE DISPOSAL" OF A CHILD'S FECES?

The safest way to dispose of a child's feces is to help the child use a toilet or latrine or, for very young children, to put or rinse their feces into a toilet or latrine. For the purposes of this brief, these disposal methods are referred to as "safe," whether the feces is deposited into an unimproved or an improved toilet or latrine. Other methods are considered "unsafe." When a child's feces are put or rinsed into an "improved" toilet or latrine, this is termed "improved child feces disposal."<sup>4</sup>

<sup>1</sup> The JMP has established a set of standardized definitions to categorize improved sanitation, which are used to track progress toward Millennium Development Goal 7. However, these definitions are not always the same as those used by national governments. See *Progress on Drinking Water and Sanitation: Update 2014*.

<sup>2</sup> WHO/UNICEF Joint Monitoring Program. 2014. *Progress on Drinking Water and Sanitation: Update 2014*. Geneva: World Health Organization.

<sup>3</sup> Data analysis was conducted for Afghanistan, Bangladesh, Burkina Faso, Cambodia, Chad, Ethiopia, Egypt, India, Indonesia, Haiti, Kenya, Lao, Madagascar, Malawi, Mozambique, Nepal, Niger, Nigeria, Pakistan–Balochistan Province, Pakistan–Punjab Province, Philippines, Senegal, Sierra Leone, Tanzania, Uganda, and Zambia.

<sup>4</sup> Bain, R., and R. Luyendijk. 2015 (in press). "Are Burial or Disposal with Garbage Safe Forms of Child Faeces Disposal? An Expert Consultation." Waterlines.



Emily Christensen Rand/World Bank

the proposed sustainable development goals of universal coverage or end open defecation by 2030, we must ensure children's feces are safely disposed of. While there is some data on how children's feces are being disposed of, in general, sanitation for children has been a neglected area of research, policy, and program intervention, and there is very little evidence of effective strategies for increasing the safe disposal of children's feces. Significant knowledge gaps must be filled before comprehensive, practical, evidence-based policy and program guidance can be made available.

## ACTION

To improve the evidence base, the World Bank Group's Water and Sanitation Program (WSP) and the United Nations Children's Fund (UNICEF) partnered to develop profiles outlining the current child feces disposal practices of caregivers and existing interventions to improve those practices for 26 locations. To develop the country profiles, Multiple Indicator Cluster Survey (MICS) Child Module or Demographic and Health Survey (DHS) Individual Module

with child feces disposal data for each country were analyzed (see regional maps in Figure 1). Responses to the survey question, "The last time your child defecated, where were the stools disposed of?" were examined to determine what the current practices were. In both data sets the questions were part of a survey targeted at women and 100 percent of the answers were supplied by females. In order to increase the comparability of the two datasets, analyses were usually restricted to children under three, except analyses where age was the background characteristic of interest. In addition, a literature review was conducted and experts in study countries contacted in order to document what methods current programs have tried to promote safe sanitation for children in each country. The documentation of programs and individual country profiles can be found at: [www.wsp.org/childfecesdisposal](http://www.wsp.org/childfecesdisposal). This research brief provides a summary of the analysis included in the individual country profiles as it relates to child feces disposal practices.

## KEY LESSONS

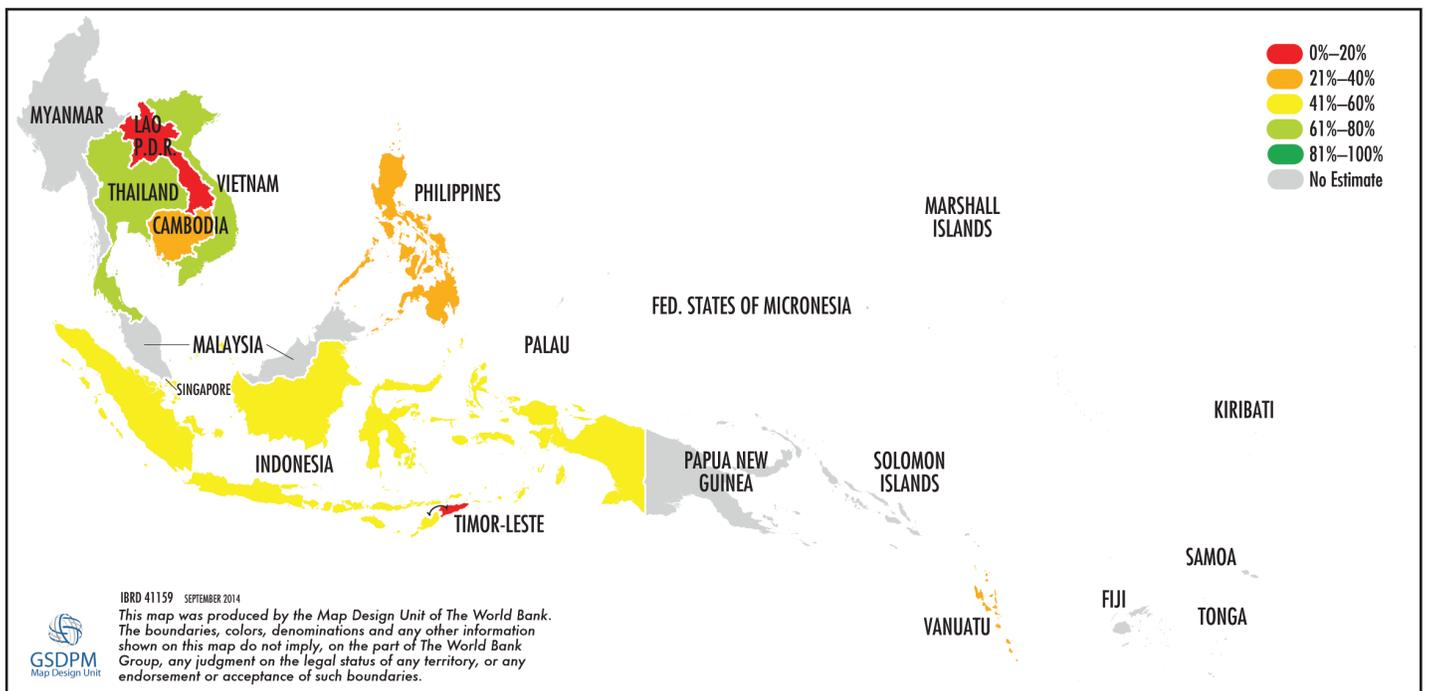
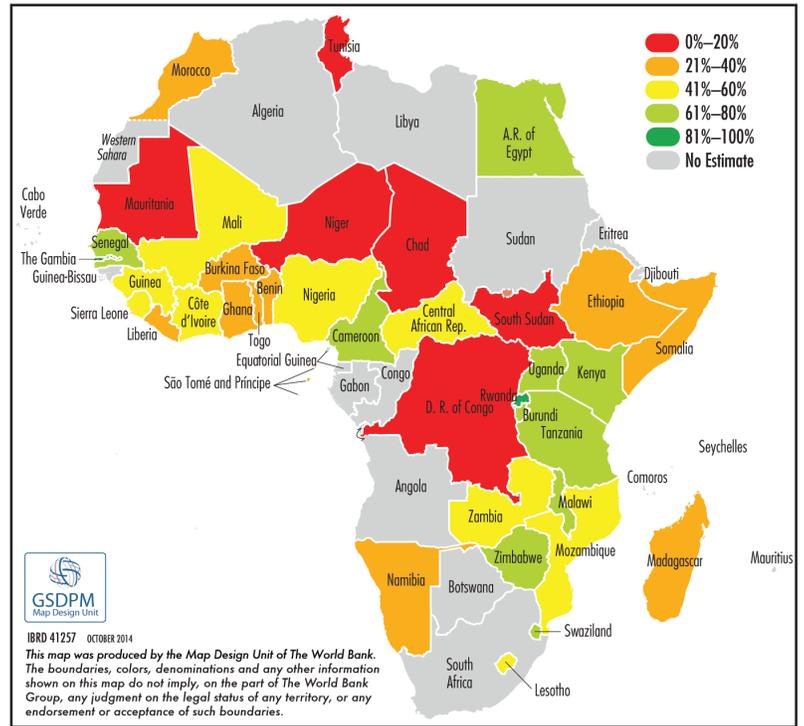
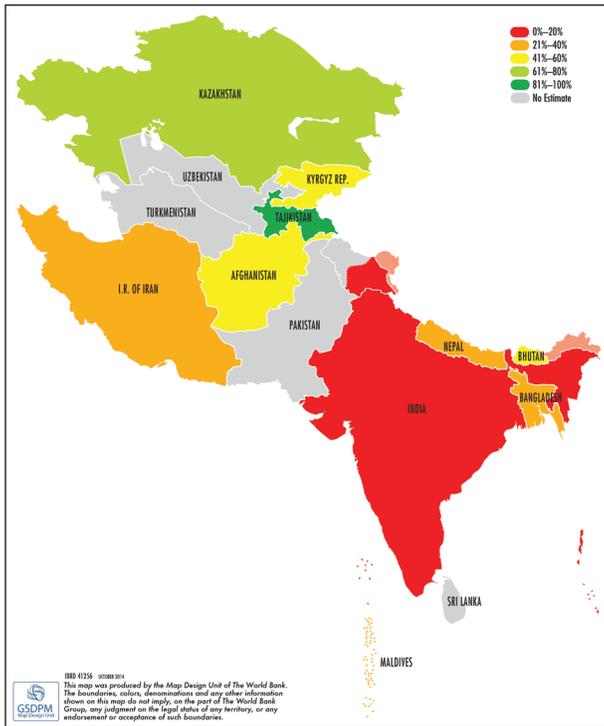
Several patterns emerged with respect to children's feces disposal among the 26 locations researched related to the wealth, age, location, and toilet type of the household.

More than 50 percent of households with children under age three in 15 of the 26 locations reported that the feces of their youngest child under age three were not deposited into any kind of improved or unimproved toilet or latrine—i.e., they were unsafely disposed of. However, an even greater proportion reported that the child's feces were not disposed



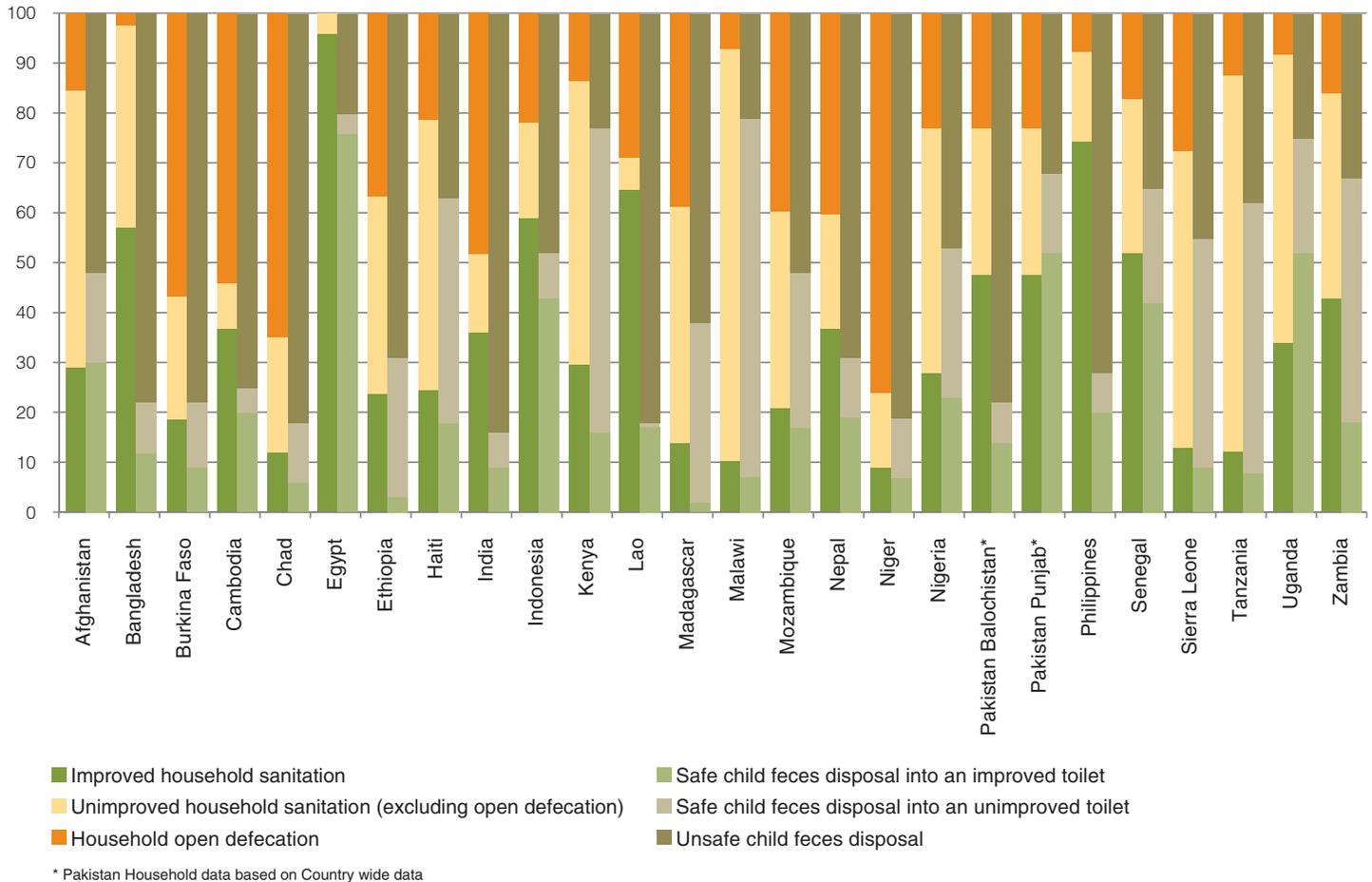
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**Figure 1: In 10 locations, less than 20 percent of children’s feces are safely disposed of. Percentage of households with available comparable Multiple Indicator Cluster Survey (MICS) or Demographic and Health Survey (DHS) data reporting safe feces disposal for their youngest child under age three for Africa, South Asia, and Southeast Asia.<sup>5</sup>**



<sup>5</sup> The latest available MICS/DHS survey with data for each country, as of March 2014. Survey years range from 2006–2012. Please see the "Related Reading" section.

**Figure 2: The rate of improved sanitation is lower among children than the broader population. Percentage of households with available comparable Multiple Indicator Cluster Survey (MICS) or Demographic and Health Survey (DHS) data reporting safe feces disposal for their youngest child under age three for select countries and JMP estimate of the percentage of the population with improved sanitation.<sup>6</sup>**



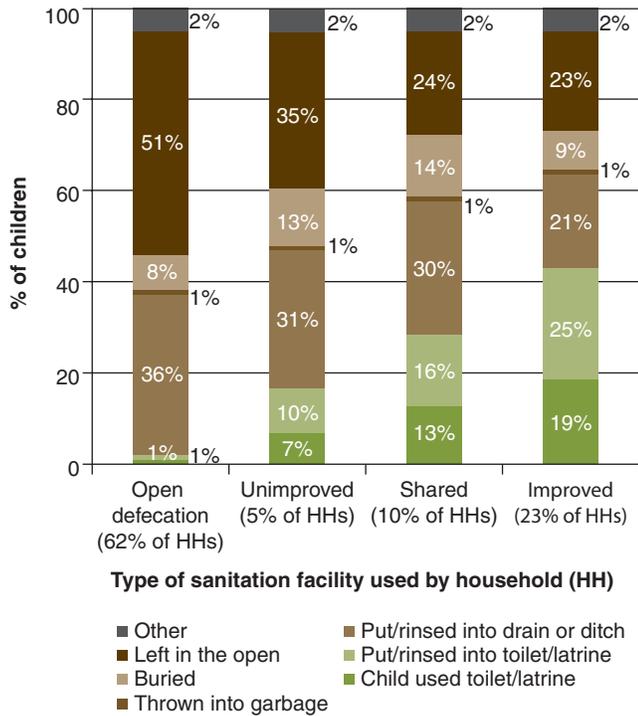
of into an improved sanitation facility. In all but three locations, the feces of children are more likely to be unsafely disposed of than the country's general population (see Figure 2).

Not surprisingly, the highest levels of unsafe child feces disposal can be found among households practicing open defecation. However, all countries reported some unsafe child feces disposal behavior, even among those households with improved sanitation. In the countries examined, between 11 and 64 percent of households with improved sanitation still unsafely disposed of their children's feces (also see regional maps in Figure 1. For example, in India, over 54 percent of households with improved sanitation still unsafely disposed of their children's feces with 23 percent of those with improved sanitation simply leaving children's feces in the open and not disposing of them in any way (see Figure 3).

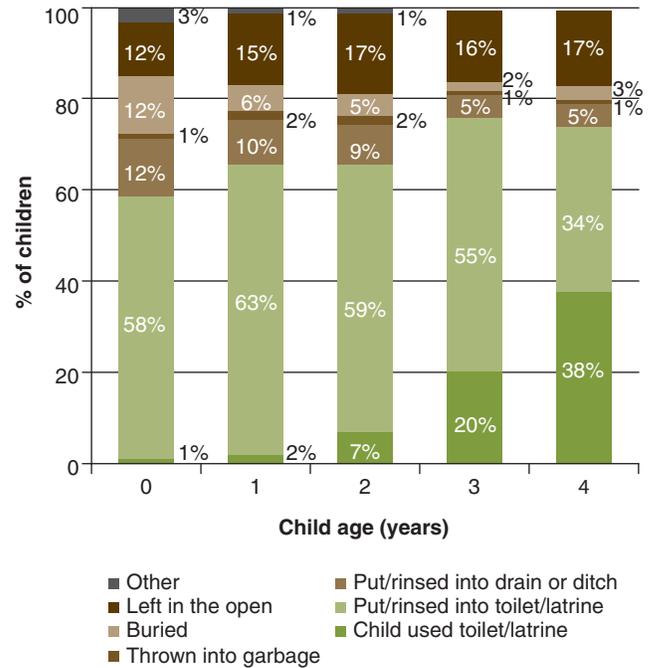
Although the severity differed, in every location, households with younger children were more likely to report unsafe disposal methods. Figure 4 shows that in Haiti, among households with children under the age of 12 months, 59 percent reported safe disposal, compared to 72 percent of those with children aged four. This shift in safe disposal practices as children grow is seen in many countries: children are increasingly likely to use a toilet or latrine themselves. At these young ages, the behavior of the children's caregiver is critical to disposing of their feces safely and shaping the child's toilet training.

<sup>6</sup> Child Feces disposal data was taken from the latest available MICS/DHS survey with data from each country, as of March 2014. Survey years range from 2006–2012. Household sanitation data was taken from the JMP 2012 data. Please see the "Related Reading" section.

**Figure 3: Even among households using improved sanitation in India, more than half (56 percent) reported unsafe child feces disposal behaviors.**  
 Reported feces disposal practice for households' youngest child under age three, by household sanitation facility type (India, 2005–2006).

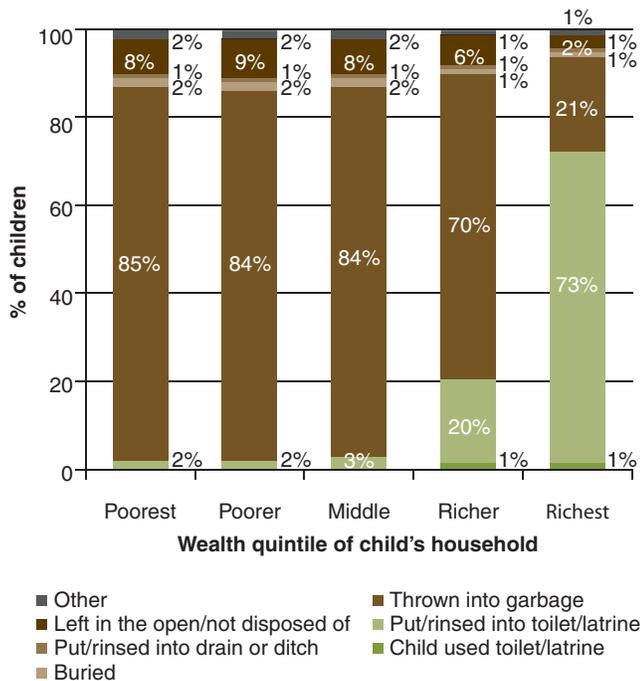


**Figure 4: Households with younger children were more likely to report unsafe disposal methods.**  
 Reported feces disposal practice for children of different ages (Haiti, 2012).



WSP Laos/World Bank

**Figure 5: Safe disposal differs across the wealth quintiles, with safe disposal somewhat more likely among the wealthiest 40 percent of households than among the least wealthy 60 percent.<sup>7</sup> Reported feces disposal practice for households' youngest child under age three, by household wealth quintile (Niger, 2012).**



Safe disposal differs across the wealth quintiles, with safe disposal somewhat more likely among the wealthiest 40 percent of households than among the least wealthy 60 percent. For example, in the poorest quintile in Niger, only 2 percent of households reported safe feces disposal for their youngest children under age three, compared to three-quarters (74 percent) of the richest households (see Figure 5).

Safe disposal remains less prevalent among rural households than urban households in every location analyzed except the Philippines and Egypt. Lao PDR is similar to many other countries, which shows the difference between rural and urban safe feces disposal as well as improvement over time (see Figure 6). This same improvement over time is seen in the general household sanitation coverage as well.

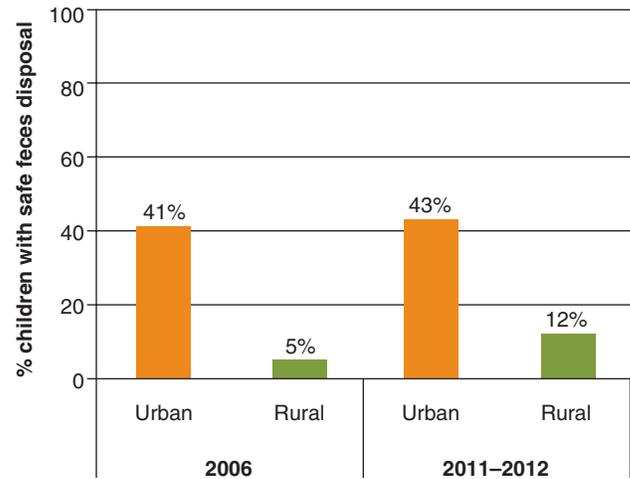
### WHAT ELSE DO WE NEED TO KNOW

Given the widespread practice of unsafe disposal of child feces, further research is needed so that governments, organizations and caregivers can start to ensure safe

<sup>7</sup> The asset indices used to classify households into wealth quintiles have not been adjusted to remove drinking water or sanitation variables.

**Figure 6: Safe disposal remains less prevalent among rural households than among urban households.**

*Percent of households reporting safe feces disposal for their youngest child under age three, by urban and rural residence (Lao PDR, 2011–2012).<sup>8</sup>*



sanitation for children. The primary questions that researchers could examine next are what improved behaviors exist and what factors influence those behaviors. In order to determine the answer to that question researchers could start to explore other questions such as:

- How do safe collection, transport, disposal, and cleaning differ as children age and their diet and mobility change?
- What is known about the intra household dynamics and the roles of men and women in assuring safe disposal of child feces?
- What safe options exist for households with limited water or other resources?
- What programs and practices can improve management of child feces?
- How do practices differ at different times of the day or in different seasons?
- How are children learning sanitation habits?
- How is hand hygiene after linked to the disposal of child feces?

<sup>8</sup> Lao PDR Ministry of Health and Lao Statistics Bureau, Ministry of Education and Sports. 2012. *Lao Social Indicator Survey (LSIS) 2011–12, Multiple Indicator Cluster Survey / Demographic And Health Survey*. Vientiane, Lao PDR: Ministry of Health; Lao PDR Department of Statistics and UNICEF. 2008. *Lao PDR Multiple Indicator Cluster Survey 2006: Final Report*. Vientiane, Lao PDR: Department of Statistics and UNICEF.

### WHY ENSURING SAFE DISPOSAL OF CHILD FECES MATTERS

There is a common belief that the feces of infants and young children are not harmful,<sup>9</sup> but this is not necessarily true. In fact, there is evidence that children's feces could be more risky than adults' feces, due to a higher prevalence of diarrhea and pathogens—such as hepatitis A, rotavirus, and *E. coli*—in children than in adults.<sup>10</sup> Therefore, children's feces should be treated with the same concern as adult feces, using safe disposal methods that ensure separation from human contact and household contamination. In particular, the unsafe disposal of children's feces may be an important contaminant in household environments, posing a high risk of exposure to young infants.<sup>11</sup> A 2005 study among children under age five in Mauche and Nessuit, Kenya, found that 37 percent of children ingest earth occasionally (less than a handful per day), and 12 percent ingest a lot (a handful or more per day).<sup>12</sup> In locations where children's feces are not being safely disposed of, feces and the accompanying pathogens may also be ingested.

Poor child feces management can result in substantial health impacts in children, including a higher prevalence of diarrheal disease, intestinal worms, enteropathy, malnutrition, and death. A 1989 study in Cebu, Philippines, found unsanitary disposal of young children's feces to be associated with a 34 percent increase in clinically diagnosed diarrheas and a 63 percent increase in pathogen positive diarrheas, compared to those who were following sanitary practices.<sup>13</sup> A study in Burkina Faso found “evidence of an association between where the mother reported disposing of the child's stools and hospital admission with diarrhoea or dysentery.”<sup>14</sup> Similarly, a 1994 study in South Sumatra, Indonesia, found that disposing of children's feces in open places rather than in a latrine was significantly associated with diarrheal disease incidence among children under age three.<sup>15</sup> In addition, in Ethiopia a bivariate and multivariate data analysis found that along with a few other characteristics, improper child stool disposal methods increased the risk of childhood diarrhoea when adjusting for other variables.<sup>16</sup> As a result of these and other studies, the Child Health Epidemiology Reference Group (CHERG) has concluded the data was “strongly suggestive” that safe stool disposal has a protective effect.<sup>17</sup>

According to the World Health Organization (WHO), most diarrheal deaths in the world (88 percent) are caused by unsafe water, sanitation, or hygiene.<sup>18</sup> More than 99 percent of these deaths are in developing countries, and about eight in every 10 deaths are children.<sup>19</sup> Diarrhea obliges households to spend significant sums on medicine, transportation, health facility fees, and more, and can mean lost work, wages, and productivity among working household members.<sup>20</sup> Stunting and worm infestation can reduce children's intellectual capacity, which affects productivity later in life. The WHO estimates that the average IQ loss per worm infection is around 3.75 points.<sup>21</sup>

- <sup>9</sup> Gil, A., C. Lanata, E. Kleinau, and M. Penny. 2004. *Children's Feces Disposal Practices in Developing Countries and Interventions to Prevent Diarrheal Diseases: A Literature Review*. Strategic Report 11. Peru: Environmental Health Project (EHP). Washington, DC: United States Agency for International Development (USAID); A. M. Almedom. 1996. “Recent Developments in Hygiene Behaviour Research: An Emphasis on Methods and Meaning.” *Tropical Medicine & International Health* 1(2):171–182; C. Bessenecker. 1994. *A Study of Child-Related Excreta Disposal Practices and Beliefs in a Peri-Urban Community of Ciudad Juarez, Mexico*. MPH Project. Houston: School of Public Health. The University of Texas Health Science Center at Houston; O. Rauyajin, V. Pasandhanatorn, V. Rauyajin, S. Na-nakorn, J. Ngarmyithayapong, and C. Varothai. 1994. “Mothers' Hygiene Behaviours and Their Determinants in Suphanburi, Thailand.” *Journal of Diarrhoeal Diseases Research* 12(1):25–34; S. Zeitlyn and F. Islam. 1991. “The Use of Soap and Water in Two Bangladeshi Communities: Implications for the Transmission of Diarrhoea.” *Reviews of Infectious Diseases* 13(suppl 4):S259–264.
- <sup>10</sup> Feachem, R., D. Bradley, H. Garelick, et al. 1983. *Sanitation and Disease: Health Aspects of Excreta and Wastewater Management*. *World Bank Studies in Water Supply and Sanitation* 3. Chichester, UK: John Wiley & Sons.
- <sup>11</sup> Gil, A., C. Lanata, E. Kleinau, and M. Penny. 2004. *Children's Feces Disposal Practices in Developing Countries and Interventions to Prevent Diarrheal Diseases: A Literature Review*. Strategic Report 11. Peru: Environmental Health Project (EHP). Washington, DC: U.S. Agency for International Development (USAID).
- <sup>12</sup> Shivoga, W. A., and W. N. Moturi. 2009. “Geophagia as a Risk Factor for Diarrhea.” *Journal of Infection in Developing Countries* 3(2):94–98.
- <sup>13</sup> Baltazar J. C., and F. S. Solon. 1989. “Disposal of Faeces of Children under Two Years Old and Diarrhoea Incidence: A Case-Control Study.” *International Journal of Epidemiology* 18(4 Suppl 2):S16–S19.
- <sup>14</sup> Curtis, Valerie, et al. 2011. “Hygiene: New Hopes, New Horizons.” *The Lancet Infectious Diseases* 11(4):312–321; Curtis, Valerie, et al. 1995. “Potties, Pits and Pipes: Explaining Hygiene Behaviour in Burkina Faso.” *Social Science & Medicine* 41(3):383–393.
- <sup>15</sup> Aulia, H., S. C. Surapaty, E. Bahar, et al. 1994. “Personal and Domestic Hygiene and Its Relationship to the Incidence of Diarrhea in South Sumatera.” *Journal of Diarrheal Diseases Research* 12(1):42–48.
- <sup>16</sup> Mihrete, T., G. Alemie, and A. Teferra. 2014. “Determinants of Childhood Diarrhea among Underfive Children in Benishangul Gumuz Regional State, North West Ethiopia.” *BMC Pediatrics* 14:102. <http://www.biomedcentral.com/1471-2431/14/102>
- <sup>17</sup> Scott, B. *Children's Stool Disposal—A Review of Prevalence of Practice and its Relationship with Health, and Recommendations for Filling the Evidence Gaps*. Unpublished. London: London School of Hygiene and Tropical Medicine.
- <sup>18</sup> Prüss-Ustun, A., A. Bartram, T. Clasen, et al. 2014. “Burden of Disease from Inadequate Water, Sanitation and Hygiene in Low- and Middle-Income Settings: A Retrospective Analysis of Data from 145 Countries.” *Tropical Medicine & International Health* 19(8):894–905.
- <sup>19</sup> WHO. 2009. *WHO Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks*. Geneva: World Health Organization, 23.
- <sup>20</sup> Favín, M., G. Miaoli, and L. Sherburne. 2004. *Improving Health through Behavior Change: A Process Guide on Hygiene Promotion*. Environmental Health Project. Washington, DC: USAID.
- <sup>21</sup> WHO. 2005. *Deworming for Health and Development. Report of the Third Global Meeting of the Partners for Parasite Control*. Geneva: World Health Organization, 15.



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## RELATED READING

The individual child feces disposal country profiles created in this series are available to download at [www.wsp.org/childfecesdisposal](http://www.wsp.org/childfecesdisposal).

## ABOUT WSP

The Water and Sanitation Program is a multi-donor partnership, part of the World Bank Group's Water Global Practice, supporting poor people in obtaining affordable, safe, and sustainable access to water and sanitation services.

## ABOUT UNICEF

The United Nations Children's Fund (UNICEF) was established by the United Nations on 11 December 1946 to meet the emergency needs of children in post-war Europe and China. In 1950, its mandate was broadened to address the long-term needs of children and women in developing countries everywhere.

This brief was developed jointly by WSP and UNICEF as part of a series of country profiles about sanitation for children under age three.

The findings, interpretations, and conclusions expressed herein are those of the author(s), and do not necessarily reflect the views of the International Bank for Reconstruction and Development / The World Bank and its affiliated organizations, or those of the Executive Directors of The World Bank or the governments they represent, or of UNICEF.

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## About the program

Today, 2.5 billion people live without access to improved sanitation. Of these, 71 percent live in rural communities. To address this challenge, WSP is working with governments and local private sectors to build capacity and strengthen performance monitoring, policy, financing, and other components needed to develop and institutionalize large scale, sustainable rural sanitation programs. With a focus on building a rigorous evidence base to support replication, WSP combines Community-Led Total Sanitation, behavior change communication, and sanitation marketing to generate sanitation demand and strengthen the supply of sanitation products and services, leading to improved health for people in rural areas. For more information, please visit [www.wsp.org/scalingupsanitation](http://www.wsp.org/scalingupsanitation).

## Contact us

If you have thoughts to share, or know of a program that is encouraging the safe disposal of children's feces, please contact WSP at [worldbankwater@worldbank.org](mailto:worldbankwater@worldbank.org) or UNICEF at [WASH@unicef.org](mailto:WASH@unicef.org) so that we can integrate your information into future program guidance.

