

Scaling Up Rural Sanitation

Investing in the Next Generation

Children grow taller, and smarter, in rural villages of Lao PDR where all community members use improved sanitation

December 2014



INTRODUCTION

One of the underlying causes of child malnutrition—in addition to the mother's and child's dietary diversity and health care situation—is unsafe water, inadequate sanitation and poor hygiene practices that lead to increased exposure to human feces.¹ When feces are ingested by young children living in unhygienic conditions, their bodies are unable to properly absorb nutrients. Children then become undernourished and stunted. Stunting makes children more vulnerable to infectious

KEY FINDINGS

- **Children living in rural villages of Lao PDR where community members defecate in the open and/or use unimproved latrines are 1.1 cm shorter than healthy children living in rural villages where everybody uses improved sanitation.** This small difference in height is irreversible and matters a great deal for a child's cognitive development and future productive potential.
- **Children are at risk of stunting even when their families use improved sanitation facilities, but other households in the rural villages where they live do not.** Universal usage of improved sanitation is needed to adequately address stunting.
- What happens today in terms of sanitation behaviors will affect the country's future. **Improving sanitation in rural communities of Lao PDR is thus a development priority that requires resources for a National Rural Sanitation Program.**
- **Future policy, targets and incentives need to be aligned to promote community-wide behavior change,** going beyond individual household interventions.
- Criteria for Lao PDR's Model Healthy Villages, now set at 60-70% access to sanitation, would best be harmonized with the Ministry of Health's **Open Defecation Free village status that requires every household to have improved access.**
- **Targeted support for the poor, especially in ethnic and remote areas, is needed to accelerate progress towards the post 2015 Sustainable Development Goals** of eliminating open defecation, progressive elimination of inequality and universal access to improved sanitation by 2030.

¹ UNICEF, 1990. Conceptual Framework, <http://www.unicef.org/nutrition/training/2.5/4.html> (accessed December 2013).

Box 1. OPEN DEFECACTION AND STUNTING

There is a growing body of evidence that links open defecation to poor child health through at least two mechanisms. The first and most commonly recognized mechanism is diarrhea from digesting feces. The second, which is only recently becoming understood, is a disorder of the intestine caused by continued fecal exposure. This condition called chronic **environmental enteropathy** prevents absorption of nutrients, even without the child getting diarrhea and appearing ill.^{2,3}

diseases and more likely to die from them.⁴ Stunted children are more likely to have poorer cognitive and educational outcomes in later childhood and adolescence.⁵ They are more likely to become less productive adults, and be less able to contribute to their nation's growth.⁶ The elimination of open defecation and unimproved sanitation should be a priority issue for policy makers who are concerned with maximizing the potential of the current and future human capital of their countries.

Key Facts

- While urban sanitation access in Lao PDR is 90%, **50% of rural households are still practicing open defecation and/or using unimproved sanitation as of 2012**. This is far below the average for rural sanitation access in Eastern Asia (excluding China) of 83%.
- **Remote and poor rural areas are even worse off and only 13% of the poorest households are using improved sanitation.**
- **Inequalities along ethnic groups are persistent**, with 74% of Lao-Tai families using improved sanitation and only 30% of Mon Khmer, 46% of Hmong-Mien and 30% of Chinese-Tibetan.
- During the last decade child malnutrition has improved very marginally and **almost 49% of rural children were stunted in 2011** [27% of urban children].
- **Stunting has a permanent impact on the life of a child.** It does not only affect the child's height, but also her/his cognitive abilities. Stunted children are likely to become less productive adults, and be less able to contribute to their country's growth and prosperity.



² Checkley, William, Gillian Buckley, Robert H Gilman, Ana MO Assis, Richard L Guerrant, Saul S Morris, KareMolbak, PalleValentiner-Branth, Claudio F Lanata, Robert E Black, and The Childhood Malnutrition and Infection Network. 2008. Multi-country analysis of the effects of diarrhoea on childhood stunting." International Journal of Epidemiology, 37: 816-830.

³ Humphrey, Jean H. 2009. Child undernutrition, tropical enteropathy, toilets, and hand-washing." The Lancet, 374: 1032 - 35.

⁴ Black, Robert E., Cesar G. Victora, Susan P. Walker, Zulfiqar A. Bhutta, Parul Christian, Mercedes de Onis, Majid Ezzati, Sally Grantham-McGregor, Joanne Katz, Reynaldo Martorell, and Ricardo Uauy. "Maternal and child under nutrition and overweight in low-income and middle-income countries". The Lancet 2013; 382 (9890): 427-451.

⁵ Grantham-McGregor S, Cheung YB, Cueto S, Glewwe P, Richter L, Strupp B. Developmental potential in the first 5 years for children in developing countries. Lancet 2007; 369: 60-70.

⁶ Vogl T. 2012. Height, Skills, and Labor Market Outcomes in Mexico. Department of Economic, Princeton University.

PROBLEM STATEMENT

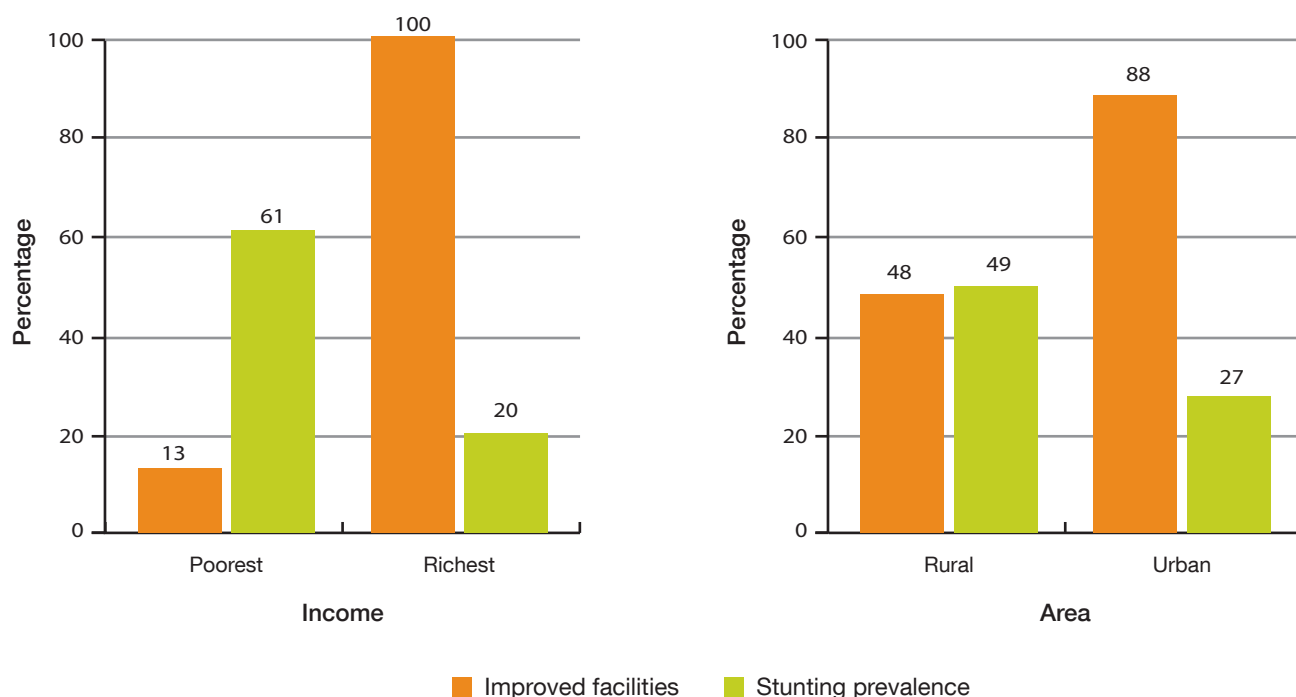
Lao PDR has made progress in expanding sanitation services during the last decade, especially in urban areas. However, access to improved sanitation remains low in rural areas: while 90% of the urban population used improved facilities, only 50% of the rural population did likewise in 2012.⁷

The poorest segments of the population are suffering most from the lack of improved sanitation facilities: in 2011, only 13% of the poorest households (100% of the richest households) were using improved sanitation. Similar patterns are found for stunting prevalence: children living in rural areas

and that were born from the poorest households are more at risk of being stunted. Almost 49% of rural children (27% of urban children) and 61% of the poorest children (20% of the richest children) were stunted in 2011.⁸

Widespread open defecation and unimproved sanitation in rural Lao PDR and high levels of stunting make us question whether poor sanitation in a rural community is associated with stunting. If it does, could a family protect her/his child from the risk of stunting by using improved facilities? Would neighbors' poor sanitation still be associated with stunting of the child's growth? And what can be done about this?

Figure 1. Sanitation and Stunting Disparities



⁷ JMP, 2014. Joint Monitoring Programme of WHO/UNICEF. Progress on Drinking Water and Sanitation – Update 2012.

⁸ LSIS, 2011. Lao People's Democratic Republic Ministry of Health and Lao Statistics Bureau, Lao Social Indicator Survey LSIS (MICS/DHS), 2011/12.

Box 2. DEFINITION OF OPEN DEFECATION AND UNIMPROVED SANITATION

Open defecation is the lack of any facility, and/or defecation in the bush, field or forest.

Unimproved sanitation is the use of pit latrines without slab/ open pit, bucket toilets, hanging toilets/latrines and toilets that flush to somewhere other than a septic tank or sewer (based on Joint Monitoring Programme of UNICEF/WHO).

research first examines whether open defecation and unimproved sanitation in a rural community are related to stunted children of different age groups across Lao PDR using 2011 LSIS data. Secondly, the analysis uses regression analysis, which looks at the relationship between a child's height and all the other factors that may potentially impact stunting, including sanitation. By using data sets from two years (2006 and 2011), the analysis examines the change in children's height over time and taking into account systematic differences across the country's regions (for example, weather-related characteristics).¹²

METHODOLOGY

An improved sanitation facility hygienically separates human excreta from human contact. This rules out both open defecation and unimproved sanitation. Stunting can be assessed by comparing the height of children younger than five to that of a reference population of healthy and well-nourished children. Children are stunted when a statistical measure called 'height-for-age Z score' is less than -2. This means that children are stunted if they are more than two standard deviations shorter than the mean of the healthy reference population.

Stunting depends on socio-economic characteristics of the child household (asset ownership and gender of the household head), child's characteristics (gender, age in months, month of birth, feeding practices, access to health services and illness) and environmental factors [sources of drinking water, water treatment method, and use of improved sanitation by the child household and by community members, crowding (number of household's and community's members) and local area electrification].⁹

This research makes use of the Multiple Indicator Cluster Survey (MICS3) 2006,¹⁰ and the Lao Social Indicator Survey (LSIS)¹¹ 2011 databases to statistically estimate the impact of (lack of) sanitation on stunting in rural villages of Lao PDR. The



⁹ Because of data unavailability, the following variables could not be included in the regression analysis for Lao PDR: mother's age, height, body mass index, education and employment status in the 12 months preceding the survey date, information on whether the child is twin and size of the child at birth, information on whether the child was given iron supplementation, place of delivery, and distance to health facility.

¹⁰ The Multiple Indicator Cluster Survey 2006 (MICS 2006) is the third Multiple Indicator Cluster Survey undertaken by the Department of Statistics (Former NSC) of the Ministry of Planning and Investment in close collaboration with the Hygiene and Prevention Department of Ministry of Health. The Lao PDR Multiple Indicator Survey is a nationally representative sample survey which was conducted between March and June 2006. The final sample size was calculated at 6,000 households (100 clusters * 3 regions * 20 households per cluster). It was known in advance that one village only had 15 households; therefore, the total expected number of households was eventually 5,995. In each region, the clusters (villages or collection of villages) were distributed to urban and rural with road access and without road access domains.

¹¹ The Lao Social Indicator Survey LSIS (MICS/DHS) was carried by the Ministry of Health (MoH) and Lao Statistics Bureau (LSB) in collaboration with line ministries. LSIS is a household-based survey that applied the technical frameworks of the Multiple Indicator Cluster Survey (MICS) and Demographic and Health Survey (DHS). The data was collected from September 2011 to February 2012 in 20,000 households in 1,000 villages around the country.

¹² For further details, see M. Quattri and S. Smets, 'Lack of community-level improved sanitation is associated with stunting in rural villages of Lao PDR and Vietnam,' submitted for the 37th WEDC International Conference 'Sustainable Water and Sanitation Services for All in a Fast Changing World', Hanoi, Vietnam, 2014.

KEY LESSONS

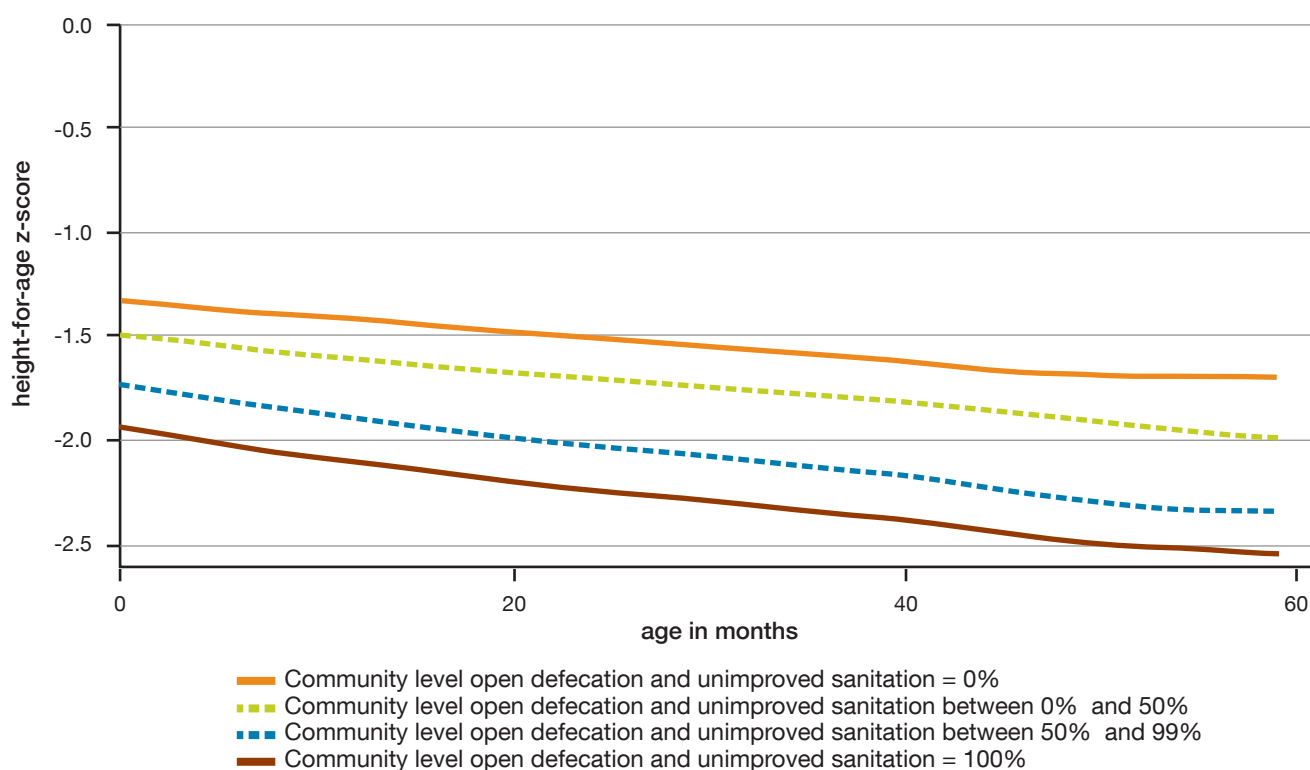
1. Children in rural villages of Lao PDR are likely to be stunted at every age, even when only a small proportion of villagers do not use improved latrines

The following figure shows the relationship between a child's height and the sanitation status of a child's rural community. The figure illustrates that, as the percentage of community members that open defecate and/or use unimproved latrines moves from 0% to 100%, children are on average shorter. Children grow shorter even when less than 50% of all community members open defecate or use unimproved. Once a child's height becomes shorter than average, it remains shorter than average at every age and even falls below the critical measure of stunting (Z score of -2).

2. Open defecation and/or unimproved sanitation in rural villages of Lao PDR is associated with shorter children living in those villages

The regression analysis suggests that, because of open defecation and/or unimproved sanitation in a rural village, an average five year old child that lives in a village where no one uses improved sanitation is 1.1 cm shorter than a child who lives in a village where everybody uses improved facilities. This value is found after taking account of ('controlling for') all the above mentioned factors that may affect stunting, the passage of time and fixed differences among regions within the country. This seemingly small difference in height is irreversible and matters a lot for a child's cognitive development and future productive potential.

Figure 2. Growth faltering (height for age z-score) of rural children under five for different ages





3. Open defecation and/or use of unimproved latrines by neighbors are associated with stunting even when the child's family uses improved facilities.

The analysis found that the use of improved facilities by a child's household has in itself no beneficial impact on that child's height if other households in the village open defecate and/or use unimproved facilities. Because of the community's lack of improved sanitation, the child is still exposed to contact with human feces and fecal bacteria. To reduce the risk and severity of stunting, all community members need to use improved sanitation.

4. Lack of improved sanitation has a permanent negative impact on a child health and development

Once the lack of community sanitation—as well as other factors that are associated with stunting—takes its toll on children's height, there is no way back and this effect is irreversible. If at a very early age children are shorter than average, by the age of five they are likely to be stunted. In villages where community members open defecate and/or use unimproved latrines, children will not only be stunted, but their cognitive abilities will also be damaged permanently.

CONCLUSION

Children are likely to be stunted if they live in rural, remote and ethnic villages of Lao PDR where community members practice open defecation and/or unimproved sanitation. Stunting is not just a measure of how tall children are: it is an indicator of children's cognitive abilities and life potential. Stunted children are more likely to have poor cognitive skills, to perform badly at school, get low-paid jobs and be less able to contribute to the country's development. Lack of improved sanitation and stunting still prevails among the poorest, and often ethnic, households in the rural villages of Lao PDR, and did not show any significant improvement in the past decade. Policies, programs and incentives should be aligned to focus on community-wide behavioral change and outcomes, going beyond interventions that focus on individual household improvements.

The National Plan for Action 2015 for Rural Water Supply and Sanitation aims to achieve 65% access to rural sanitation and Lao PDR's 'Model Healthy Village Program' sets the bar for a healthy village in terms of sanitation at 60% for villages without road access and 70% for villages with road access. The Lao PDR Government has successfully implemented Community-Led Total Sanitation in several regions of Lao PDR and has issued a Guideline for Open Defecation Free Village Status, which is defined by 100% of households using improved facilities. The National Plan of Action also recognizes the importance of community mobilization and behavioral change to promote a new social norm within communities, supported by a strong local supply chain of affordable, accessible and aspirational toilets. This research suggests that sanitation criteria under the Model Healthy Village Program would best be harmonized with the Ministry of Health's Guideline for Open Defecation Free Village Status to adequately address stunting.



Envisioning Lao PDR's intended graduation as a Least Developed Country by 2020, a national rural sanitation program needs to be put in place with adequate funding to ultimately achieve universal usage of improved sanitation. Future policies, targets and incentives for rural sanitation should be aligned to promote village-wide behavior change and would need to be adopted by the Model Healthy Village Program. A national rural sanitation program would need to include targeted support for the poor, especially in Lao PDR's ethnic, mountainous and remote regions to ensure

pro-poor outcomes. This would ensure further progress towards the post 2015 Sustainable Development Goals of eliminating open defecation, progressive elimination of inequality and universal access to improved sanitation by 2030.¹³

Finally, Lao PDR's National Nutrition Strategy and Plan of Action 2010-2015, which recognizes sanitation as a nutrition sensitive intervention, offers opportunities for multi-sectoral responses in order to overcome persistent stunting and to achieve community-wide improved sanitation.



¹³ WSSC, 2014. Water Supply and Sanitation Collaborative Council. Water Supply, Sanitation and Hygiene Targets and Indicators Post-2015. Fact sheet: Comprehensive recommendations – updated April 2014.

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. WSP's donors include Australia, Austria, Denmark, Finland, France, the Bill & Melinda Gates Foundation, Luxembourg, Netherlands, Norway, Sweden, Switzerland, United Kingdom, United States, and the World Bank.

The findings, interpretations, and conclusions expressed herein are entirely those of the author and should not be attributed to the World Bank or its affiliated organizations, or to members of the Board of Executive Directors of the World Bank or the governments they represent.

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Scaling Up Rural Sanitation

Today, 2.5 billion people live without access to improved sanitation. Of these, 71% 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.

Contact Us

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