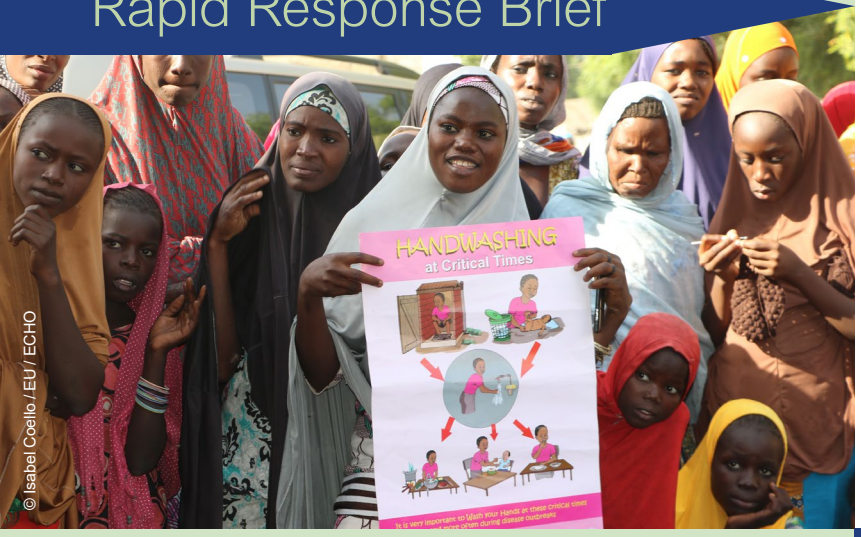
Rapid Response Brief



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Do latrine access and other WASH interventions reduce child malnutrition?

Improved sanitation and nutrition are both key United Nations Sustainable Development Goals (SDGs). For governments and development actors striving to achieve these goals, understanding how the two interact is essential. Malnutrition and poor sanitation are both major problems in West Africa, and interventions that can address the synergies between the two have the potential to be very effective. In response to a question from a policymaker in Côte d'Ivoire, this rapid response note provides evidence on the effects of latrines and other WASH interventions on child malnutrition, based on three systematic reviews and three experimental studies.

Key findings

- The provision of improved latrines did not show an effect on malnutrition.
- The transition from open defecation to the use of sanitary facilities decreases stunting.
- WASH interventions do not improve the effectiveness of nutrition interventions.

Key recommendations

- Although there is little evidence that WASH interventions reduce malnutrition, access to improved sanitation is essential.
- Eliminating a single source of contamination may not be sufficient to produce significant health and welfare effects as long as other sources of contamination are present in households and communities.
- To effectively reduce malnutrition, WASH interventions (which completely transform the WASH environment) should be combined with nutrition interventions.
- Actors in the nutrition system should work together to implement programs to improve child and household nutrition.
- To develop improved evidence, different actors should also harmonize nutrition data collection and measurement tools to better assess the effects of interventions. In addition, research is needed on interventions implemented on a large scale which can yield generalizable results.

3ie International Initiative for Impact Evaluation

WACIE
West Africa Capacity-building and Impact Evaluation Program
Programme de renforcement des capacités et d'évaluation d'impact en Afrique de l'Ouest

Context

The prevalence of malnutrition is 12.6 percent worldwide, with higher rates in sub-Saharan Africa where 16.9 percent of children under five were malnourished in 2020 (World Bank, 2020). This figure could double due to COVID-19. In 2021, 17.8 percent of children under five in Côte d'Ivoire were stunted, meaning they were small for their age, and 6.1 percent were wasted, meaning they were underweight for their height. In addition, 18 percent of the population in Côte d'Ivoire was acutely food insecure.

Recurrent infections caused by poor sanitation can be a major cause of stunting. These infections can be caused by a lack of access to latrines, open defecation, or poor fecal disposal. However, in 2020, only 6 percent of people in West Africa had access to sewer connections, 18% had access to safely managed septic tanks, and 35% had access to latrines or other safely managed sanitation facilities.

Details of the interventions

This note is based on three systematic reviews that analyzed the effects of sanitation interventions on child malnutrition and three other experimental studies. The systematic reviews included 28 interventions that improved access to clean sanitation facilities (flush toilets, sewage systems, septic tanks, flush/flush to pit latrines, potty facilities for young children, or handwashing stations), along with interventions including education for behavior change. These interventions primarily targeted households with children under five years of age. The primary variables of interest were weight, height, weight-for-height, and stunting or wasting rates. Most interventions were funded by national government agencies and international aid agencies. Studies have been conducted in Africa, Asia, and Latin America.

Ten interventions were evaluated alone and 18 interventions were evaluated together in a meta-regression. Ten interventions were implemented in Africa (Kenya, Lesotho, Mali, Ethiopia, Tanzania, Uganda, Zimbabwe); sixteen were implemented in Asia (India, Indonesia, Pakistan, Nepal, and Bangladesh); one was implemented in Central America (Guatemala); and one was implemented in South America (Peru).

Findings

Does access to clean latrines reduce malnutrition?

Generally, studies examining the relationship between latrine access and malnutrition find no association. However, a reduction in stunting has been linked to the transition from open defecation to the use of sanitation facilities. Ten studies evaluated the effect of access to clean latrines on child growth. Six studies conducted in India, Ethiopia, Zimbabwe, and Kenya showed no significant differences in growth between children who had access to clean latrines and those who did not.

However, evidence on the effects of interventions that provided access to latrines is limited. Three precursor cluster randomized trials, WASH-Benefits in Kenya and Bangladesh, and SHINE in Zimbabwe, provided latrines and conducted other WASH program activities. There was no effect of these interventions on child height. The authors of these trials argue that their results do not undermine the relationship between WASH interventions and malnutrition. On the contrary, because of the relatively good WASH conditions at baseline, the limited environmental impact of the interventions, and the low prevalence of diarrhea, more comprehensive WASH interventions are needed to make significant improvements.

Do WASH interventions prevent malnutrition?

There is little evidence that WASH interventions can prevent wasting or improve the treatment of malnutrition. A meta-analysis of eighteen studies found no effect on weight, height, or weight-for-height. However, four studies found that the height of children under two years of age increased. These interventions were implemented between 2011 and 2018 in Chad, Pakistan, Kenya, Bangladesh, Zimbabwe, Gambia, India, Malawi, and China. A natural experiment in rural Gambia found that the impacts of WASH interventions on height and weight varied according to household socioeconomic status. The combined WASH interventions increased the height and weight of children with high socioeconomic status.

There is little evidence that combining WASH programs with nutrition interventions increased the effects of the interventions. A meta-analysis comparing nutrition interventions with WASH plus nutrition interventions found no difference in impact on weight, height, or weight-for-height (Bekele et al, 2020). However, a separate analysis comparing WASH interventions to “WASH plus nutrition” interventions found that interventions that provided WASH and nutrition improved all three growth measures more than those that considered WASH alone. These comparisons were based on studies in India, Guatemala, Pakistan, Tanzania, Indonesia, Kenya, Ethiopia, Peru, Zimbabwe, Nepal, Bangladesh, Uganda, and Mali. In addition, the WASH-Benefits Kenya and WASH SHINE interventions found no additional benefit from the WASH program when added to a nutrition intervention.

Recommendations

Although only a few recent studies in Africa have been published, literature reviews have shown little evidence that latrine construction or other WASH interventions improve nutrition variables of interest. However, the human welfare implications of access to latrines and other WASH facilities should not be ignored simply because they do not improve nutrition indicators. Access to safe sanitation is a basic human right. Latrine construction and access is key for people, especially women, to preserve their dignity. When installed in public places, latrines can facilitate women's integration into public life. However, home latrines can do the opposite: eliminate a key opportunity for women to meet and converse together.

The interventions presented here may not have been successful because other sources of contamination remained. Eliminating one or a few selected sources of contamination may not be sufficient to significantly improve health. Instead, a total transformation of the local WASH environment may be necessary to make significant improvements in nutrition. Because of the proven causal effect of poor sanitation on growth, there is reason to believe that improvements in sanitation can still result in better nutrition outcomes. Additional studies on WASH combined with nutrition are therefore needed.

Actors in the nutrition system should coordinate their interventions and harmonize nutrition data collection and measurement tools to better assess the effects of interventions. Common indicators measuring nutrition are needed, and data collected on the variables like access to water, sanitation and hygiene should be linked to each other.

In terms of generating scientific evidence, studies on interventions implemented on a large scale, such as nationwide, will allow the results of studies measuring their effects to be generalized. In addition, the collection of location data (GPS) is necessary to visualize (map) the coverage of safe water, sanitation, hygiene and nutrition interventions in a geographic area or territory.

This rapid response brief is based on the following systematic reviews and studies

Bekele, T., Rawstorne, P., & Rahman, B. (2020). Effect of water, sanitation and hygiene interventions alone and combined with nutrition on child growth in low- and middle-income countries: a systematic review and meta-analysis. *BMJ open, 10(7)*, e034812.

Cumming, O., Arnold, B. F., Ban, R., Clasen, T., Esteves Mills, J., Freeman, M. C., ... & Colford, J. M. (2019). The implications of three major new trials for the effect of water, sanitation and hygiene on childhood diarrhea and stunting: a consensus statement. BMC medicine, 17(1), 1-9.

Patlán-Hernández, A. R., Stobaugh, H. C., Cumming, O., Angioletti, A., Pantchova, D., Lapègue, J., ... & N'Diaye, D. S. (2022). Water, sanitation and hygiene interventions and the prevention and treatment of childhood acute malnutrition: A systematic review. *Maternal & child nutrition, 18*

Rahman, M., Ashraf, S., Unicomb, L., Mainuddin, A. K. M., Parvez, S. M., Begum, F., ... & Winch, P. J. (2018). WASH Benefits Bangladesh trial: system for monitoring coverage and quality in an efficacy trial. Trials, 19(1), 1-8.

Rogawski McQuade, E. T., Platts-Mills, J. A., Gratz, J., Zhang, J., Moulton, L. H., Mutasa, K., ... & Houpt, E. R. (2020). Impact of water quality, sanitation, handwashing, and nutritional interventions on enteric infections in rural Zimbabwe: the Sanitation Hygiene Infant Nutrition Efficacy (SHINE) Trial. The Journal of infectious diseases, 221(8), 1379-1386.

Stewart, C. P., Kariger, P., Fernald, L., Pickering, A. J., Arnold, C. D., Arnold, B. F., ... & Null, C. (2018). Effects of water quality, sanitation, handwashing, and nutritional interventions on child development in rural Kenya (WASH Benefits Kenya): a cluster-randomized controlled trial. The lancet child & adolescent health, 2(4), 269-280.

Waller, A., Lakhanpaul, M., Godfrey, S., & Parikh, P. (2020). Multiple and complex links between babyWASH and stunting: an evidence synthesis. Journal of Water, Sanitation and Hygiene for Development, 10(4), 786-805.

What is the WACIE Helpdesk

The WACIE helpdesk provides rapid synthesis and evidence translation to help policymakers in West Africa understand what evidence exists for specific policy questions. The helpdesk can also connect interested policymakers with further resources to meet additional needs. It is staffed by the WACIE Secretariat with engagement from the wider 3ie technical staff and other experts as needed.

To submit a policy question, or for additional information, contact wacie@3ieimpact.org.

What is WACIE?

The West Africa Capacity Building and Impact Evaluation (WACIE) program, a partnership between 3ie and the Government of Benin, was launched to help build evaluation capacity in the eight countries that comprise the West African Economic and Monetary Union (WAEMU): Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo. Program goals include increasing evaluation capacity in targeted countries, ensuring that policymakers have access to relevant evidence and promoting take-up of high-quality evidence by relevant stakeholders.

Endnotes

[1] https://donnees.banquemondiale.org/indicator/SH.STA.MALN.ZS
[2] https://www.thelancet.com/article/S0140-6736(20)31647-0/fulltext
[3] https://www.fao.org/3/cb4474en/cb4474en.pdf
[4] EDS – CI : Enquête Démographique et de Santé réalisée en 2021 en Côte d'Ivoire (EDS-CI 2021)
[5] https://www.fao.org/3/cb4474en/cb4474en.pdf
6 https://washdata.org/sites/default/files/2022-03/jmp-2022-regional-snapshot-Africa.pdf