Stakeholder preferences regarding Shigella vaccines in Kenya

Assessing disease awareness and the value of prospective Shigella vaccines

Shigella is the leading bacterial cause of childhood diarrhea globally, resulting in more than 60,000 deaths and millions of hospitalizations each year.1 It typically causes severe or bloody diarrhea ("dysentery"), and Shigella infections have long-term effects on growth and development, including severe malnutrition, stunting and metabolic disorders, as well as increased mortality from other infectious diseases.2,3,4 Additionally, there is strong evidence of increasing antimicrobial resistance (AMR) to Shigella,5 which is concerning because diarrhea from Shigella is not always bloody, often leading to misdiagnosis and inappropriate antibiotic use. No licensed Shigella vaccines currently exist, but several promising candidates in development, given as one or two doses between the ages of six months and one year, could become available in a few years. Given numerous competing disease prevention priorities in low- and middle-income countries (LMICs), input from key stakeholders is required to accurately understand and estimate country demand for Shigella vaccines.

PATH conducted a series of studies and analyses to evaluate the public health value of potential Shigella vaccines and help inform decisions by international agencies, funders, vaccine developers, and national policymakers. This included a multi-country feasibility and acceptability study with national stakeholders and healthcare providers in Burkina Faso, Ghana, Kenya, Nepal, and Vietnam to identify preferences and priorities for future Shigella vaccines. This brief provides an overview of the study results, with a focus on Kenya. The Kenyatta National Hospital-University of Nairobi Ethics Research Committee and the Kenyan National Commission for Science, Technology & Innovation approved these study activities. (Manuscript will be submitted to a peer-reviewed journal.)

Key takeaways across all countries

♦ Study participants most frequently mentioned diarrhea as a key health concern for children younger than five years old. Though when asked to rate the severity of given health concerns, they rated related, longer-term issues—such as malnutrition, stunting, and increased risk of AMR—as very serious. Conversely, Shigella was not perceived as a critical health threat.

♦ Participants are willing to consider adding another vaccine to the immunization schedule, in theory. However, their interest in introducing a Shigella vaccine was tempered by a lower perceived burden of Shigella relative to other vaccine-preventable diseases and heightened concern about the number of concomitant injections children already receive.

♦ The overall priority of Shigella vaccines rose among participants as they were provided with progressively more country-specific information about the possibility of preventing longer-term issues related to Shigella, notably reducing AMR and stunting. While this was consistent across both participant groups, healthcare providers prioritized Shigella vaccines higher than national stakeholders.

♦ When asked to choose between different Shigella vaccine attributes, participants selected those with greater perceived community acceptability, with strong preferences for an oral vaccine and a Shigella-containing combination vaccine.

Kenya’s spotlight

In Kenya, Shigella is estimated to be responsible for 209,000 cases of moderate-to-severe diarrhea and 590 deaths in children younger than five years old annually.4 Assumptions made for this study included that a Shigella vaccine, available in 2025 to 2030, would be 60 percent effective and could prevent 115,342 moderate-to-severe diarrhea cases, 15,400 stunting cases, and 315 deaths due to Shigella each year in children younger than five years in Kenya.7 In Kenya, 5 national stakeholders and 10 healthcare providers were interviewed.

Methods

From October 2021 to August 2022, PATH worked with investigators in five countries to interview 32 national stakeholders and 54 healthcare providers to assess their health concerns and perceptions associated with prospective Shigella vaccines. Participants were asked about their prioritization of and preferred attributes for a Shigella vaccine after receiving progressively more information about the vaccine’s potential impact in their country. National stakeholders were members of the Ministry of Health with roles in immunization policy making, programming or financing, diarrhea control, or nutrition policy making, or were considered policy influencers based on their role in public health. Healthcare providers were from facilities that provided immunization and were in charge of the facility or worked in immunization, diarrheal control, integrated management of childhood illnesses, or nutrition services.
Participants in Kenya indicated a higher level of concern about diarrhea, but less concern about stunting and AMR, compared to other study countries. Results from this study indicate that all countries need more context-specific data, such as disease burden and improved diagnostic tools, to better understand the importance of Shigella specifically and the potential impact of a vaccine. When participants indicated that Shigella was a lower priority, they often mentioned this issue. Twelve participants emphasized the need for more data; one participant cited, “we don’t have [a] good surveillance system” specifically on Shigella burden. In addition, six participants called for improved availability of tools for diagnosing Shigella, for example, noting “there is no definite diagnosis of diarrhea at health facilities.”

Kenya’s spotlight

Participants in Kenya indicated a higher level of concern about diarrhea, but less concern about stunting and AMR, compared to other study countries.

How important is each health issue?

Kenya health care providers indicated that diarrhea is a serious health concern because it accounts for a lot of morbidity and mortality in children under five years.

Right now we do not have the data on Shigella. I would say we put it at low priority because we do not have the numbers.

— Kenya national stakeholder

— Kenya healthcare provider
Key Question 2: What benefits would compel participants to prioritize introducing a Shigella vaccine?

Participants had an overall positive view of vaccines and indicated a willingness to consider new vaccine introductions if the benefits are compelling. However, with no additional information or burden data provided on Shigella, just 16 percent of national stakeholders cited Shigella vaccines as a high priority compared to 55 percent of healthcare providers. While estimates of Shigella diarrhea morbidity and mortality did not increase the priority of a Shigella vaccine for national stakeholders, information on potential vaccine impact on AMR and stunting prompted both groups to prioritize the vaccine more highly.

Across the study, one quarter of national stakeholders consistently considered Shigella vaccines as “low” or “not a” priority regardless of the potential additional benefits, due to competing health priorities in their countries and the perceived low disease burden of Shigella. Healthcare providers had a higher baseline prioritization and were less sensitive to additional vaccine benefits compared to national stakeholders, though they continued to cite concerns about adding more vaccines to the immunization schedule.

The differences in priority of Shigella vaccines among all participants are closely aligned with their perceptions of disease severity and broader vaccine benefits. Those who rated Shigella as a serious health concern and vaccines as a high priority attributed their prioritization to broad health impacts, citing it “decreases another disease burden” and “spares the loss of cognitive and physical impairments.” Prioritization only increased for many participants when impacts against stunting and especially AMR were added, reflecting the perceived severity or burden of these issues. When participants indicated a vaccine was not a priority, they cited the expected low impact, whether because the “burden of death [due to Shigella] was not large,” “antibiotic resistance is a very complicated story,” or “we have more pressing problems to deal with.”

Kenya’s spotlight

In Kenya, the average prioritization of Shigella vaccines when given increasing information on potential vaccine impacts was similar among national stakeholders and was consistent, if a bit lower, compared to other study countries. Some were concerned about financing in light of the forthcoming Gavi transition. Among healthcare providers, however, prioritization was universally high for all potential impacts.

I would think probably there are other more urgent vaccines. For example, in malaria-endemic areas, RTS,S vaccine for malaria is quite important.

– Kenya national stakeholder

Despite the vaccines that we have, diarrhea is still among the top diseases that are killing our children. So, if we have a vaccine that can prevent diarrhea, then why not?

– Kenya healthcare provider
Key Question 3: What attributes affect participant willingness to introduce a Shigella vaccine?

When asked to choose which vaccine attributes would affect their willingness to introduce a Shigella vaccine, participants largely selected those with greater perceived community acceptability. Both national stakeholders and healthcare providers had a strong preference for an oral vaccine because “it reduces the number of shots” and “is less painful, therefore moms like it.” Most participants also preferred a combination vaccine that would protect against Shigella and at least one other pathogen “because you don’t have to prick multiple times,” which makes it “more acceptable.” Participants also indicated that both oral and combination vaccines have the additional benefit of being more convenient for health workers. A few healthcare providers preferred either a single injectable or single antigen vaccine, attributing their preference to concerns about vaccine efficacy, such as “the child may vomit [an oral vaccine].” Participants were also asked about how a series of other vaccine attributes (i.e., -20°C storage, lyophilization, single-dose packaging, booster-dose requirement) would affect their willingness to introduce a Shigella vaccine. These did not change participants’ interest in a vaccine substantially, except for -20°C cold chain storage, which was viewed as an insurmountable challenge. Findings were similar across all study countries.

Kenya’s spotlight

Which vaccine attribute do you prefer?

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Conclusions and next steps

This study provides critical insights into country-level preferences for prospective Shigella vaccines and increases understanding of how national stakeholders and healthcare providers prioritize different attributes when making vaccine decisions. Compared to other countries, diarrhea was considered more concerning to participants in Kenya, as was Shigella for national stakeholders. Stunting and AMR were considered less concerning. Vaccine priority was mixed in Kenya—national stakeholders typically prioritized a Shigella vaccine similarly, if a bit lower, than their peers in other countries, but conversely, prioritization among healthcare providers was higher. It is important to note that preferences may shift over time due to multiple influencing factors, and may be different if or when licensed Shigella vaccines become available.

These results contribute to PATH’s broader effort to assess the public health value of potential Shigella vaccines. While there appears to be awareness of Shigella in the study countries, its prevention by vaccination is only a moderate priority. However, this prioritization increased when accounting for potential impact on reducing stunting and AMR or the inclusion of Shigella in a combination vaccine that also targets other pathogens of importance. The results also elucidate a need for improved Shigella surveillance within countries, as well as greater awareness of the global and local burden of Shigella, especially with respect to its role in stunting and AMR, and the potential impact that a vaccine could have in addressing these issues. These collective findings may help guide investment decisions by donors and vaccine developers to better meet LMIC needs, influence clinical trial designs, or help inform global policy guidance and national vaccine introduction decision-making in the future.

References