

An opportunity not to be missed

Vaccination as an entry point for hygiene promotion and diarrhoeal disease reduction in Nepal

Yael Velleman (WaterAid), Katie Greenland (LSHTM) and Om Prasad Gautam (LSHTM)



Summary

Worldwide, diarrhoea remains a leading cause of under-five mortality. This is partly due to failures to increase access to safe water, improved sanitation and hygiene practices (WASH). Vaccines for rotavirus, a leading cause of diarrhoea, have recently been recommended for introduction in low-income countries, but there has been little discussion on the delivery of such vaccines as part of a comprehensive package of interventions to reduce diarrhoea, including WASH. Immunisation programmes are a potentially natural entry point for sanitation and hygiene promotion to reinforce disease control efforts.

Between April and May 2012 an exploratory study took place in Nepal to **ascertain whether or not vaccination programmes offer a useful entry point for hygiene promotion and to define options for piloting**

and scaling up of a hygiene promotion intervention in Nepal.

Incorporating hygiene promotion with an immunisation programme was considered an acceptable and feasible approach, in line with the recommendations of the Nepal National Committee on Immunisation Practice. Participants favoured implementing hygiene promotion with routine immunisation and made recommendations on institutional responsibilities, approaches and delivery mechanisms. Consultation has now begun on piloting this approach in several parts of Nepal.

Piloting the approach over the next few years will enable the development of a strategy that can optimise intervention delivery and uptake once rotavirus vaccines are introduced into Nepal's routine immunisation schedule, helping to contribute to a reduction in the diarrhoeal disease burden in Nepal.



“Not integrating WASH into vaccination programmes... is a missed opportunity.”

FCHV administering Polio vaccine in a rural vaccination booth, Kaski district.

Briefing note

Background

Diarrhoeal diseases are preventable. Yet globally, diarrhoea, mostly caused by lack of safe drinking water, sanitation and hygiene (WASH)¹, remains a leading cause of death among children under five². This resulted in the deaths of over 801,000 children in 2010 alone³. Diarrhoeal diseases are associated with malnutrition and may increase the risk of infectious diseases such as pneumonia⁴. Rotaviruses are a leading cause of severe diarrhoea and dehydration in infants and young children globally. Similarly, cholera continues to be a major cause of illness and death in low income countries, with a 43% increase in the number of cases in 2010 compared to 2009, and a 130% increase compared to the number of cases in 2000⁵. While major advances in treating diarrhoea have been made, diarrhoea prevention remains challenging due to failures to increase access to WASH services in areas with high disease burden. Handwashing with soap alone can reduce childhood diarrhoea by 30-47%⁶, as well as reduce other fatal infections such as acute respiratory infections⁷, yet it is inadequately practiced at critical times⁸.

Vaccines: Tackling diarrhoeal diseases requires a comprehensive package of preventive and curative interventions⁹. The rotavirus vaccination is a relatively new addition to this package, with two vaccines, Rotarix and RotaTeq, recommended by the World Health Organization (WHO) for global routine immunisation since 2009¹⁰. Vaccines are considered essential for reduction of rotavirus diarrhoea as preventive WASH measures are insufficient to protect against this highly-infectious virus that affects children globally, even in areas of full WASH coverage. The drive for vaccine solutions to diarrhoeal diseases has seen a significant boost in 2011 as part of the global ‘Decade of Vaccines’, which includes the adoption of a Global Vaccine Action Plan in 2012¹¹. This has been accompanied by increasing availability of funding for vaccines, with the expectation that low-income countries will adopt new vaccines such as rotavirus as part of their routine immunisation programmes.

WASH and vaccines: The focus on vaccine solutions for diarrhoea raises concerns that this may lead to a decreased emphasis on WASH as an essential measure for preventing the transmission of diarrhoea. With much emphasis in the media on the rotavirus vaccine as a ‘diarrhoea’ vaccine¹², it is rarely asked whether vaccines alone can significantly reduce the burden of diarrhoea-related illnesses and death. WASH is often viewed as a complex and expensive set of interventions necessitating major infrastructure – largely ignoring the role of non-infrastructure interventions such as hygiene and

sanitation promotion. Vaccines, on the other hand, offer an immediate and highly visible response and are therefore more attractive politically; in fact, “the decision on whether to adopt new vaccines is made at senior political levels and is not always evidence-based”¹³. Since Rotavirus causes just over one-third of diarrhoeal deaths globally¹⁴, it can be argued that with a perfect vaccine and delivery system, about one third of diarrhoeal deaths could be prevented – an impressive figure, but not when compared to the potential impact of a more holistic approach that addresses multiple causes of infectious diseases¹⁵. Such holistic approaches however are rarely practiced and evaluated, and there is an urgent need for generating evidence about this issue to inform policy and programme design.

WASH and vaccine efficacy: WASH could potentially play a role in improving vaccine efficacy – a measure of the protection a vaccinated individual receives from a vaccine. Crucially, vaccines delivered orally as drops, in contrast to injected vaccines, have had a lower immune response or efficacy in trials done in low-income countries than in middle/high income countries¹⁶. In the case of rotavirus vaccines, which are orally-administered, a systematic review of published vaccine efficacy trials found that rotavirus vaccines prevented 42.7% of severe rotavirus episodes in high-mortality Asia, and 50% in sub-Saharan Africa, compared with 91% of episodes in developed countries¹⁷. Several factors may account for this reduced efficacy, and it has been suggested that oral vaccine response can be weakened if the vaccinated person is experiencing WASH-related enteric infections, including diarrhoea and environmental enteropathy – a disorder of the small intestine that affects nutrient absorption in people living without basic sanitary facilities, who are chronically exposed to faecal contamination¹⁸. The WHO’s Strategic Advisory Group of Experts on vaccines and immunisations has recently highlighted that there are “opportunities to link prevention and control efforts for these diseases, which will complement broader goals of improving living conditions, sanitation and access to safe water”¹⁹. Such an approach could potentially produce greater health outcomes compared with single interventions.

Immunisation programmes as an entry point for hygiene promotion: Immunisation programmes could provide an entry point for efforts to improve sanitation and hygiene practices. A recent report by WaterAid highlighted the critical role of the health sector in promoting sanitation and hygiene behaviour change, building on its comparative advantage in terms of community-level reach, and expertise in generating demand for services²⁰. Immunisation programmes have

Briefing note



Discussion with FCHVs at a health post in Kaski district.

similar advantages and could allow reaching more people with promotional messages. Given the potential impact on diarrhoea reduction and vaccine efficacy, this provides a cost-effective and results-oriented approach.

Study rationale: A study to explore new approaches for hygiene promotion was undertaken in Nepal, selected because of its high diarrhoeal disease burden and low levels of water and sanitation coverage, as well as its experience in implementing successful immunisation programmes. The aim of the study was to ascertain whether incorporating a hygiene promotion intervention into immunisation programmes is feasible and acceptable (an operational definition of ‘hygiene interventions’ was adopted: handwashing with soap at critical times; food hygiene; domestic hygiene; solid and liquid waste management). The study was made more relevant by a decision by the Nepal National Committee on Immunisation Practices recommending the introduction of the rotavirus vaccine into the national immunisation programme around 2016.

“Nothing is impossible; we should make this integration feasible for the benefit of the Nepali children... who should take lead within the health sector, how should this be implemented, how much extra resources are needed, what would be the delivery mechanism?”

The study

The study was undertaken by WaterAid and the Hygiene Centre at the London School of Hygiene and Tropical Medicine, and jointly funded by WaterAid and the Sanitation and Hygiene Applied Research for Equity (SHARE) DfID-funded consortium. The study involved:

- **Field visits:** Eight rural and urban vaccination booths in Kaski District were visited during the Polio National Immunisation Days 28-29 April 2012, in which the vaccine is administered orally by Female Community Health Volunteers (FCHVs). FCHVs are the pillars of Nepal’s community-based primary health care system and act as links between health services and communities. They help deliver public health programmes, including family planning, maternal care, child health, vitamin A supplementation/ de-worming and immunisation.
- **Focus group discussions:** Four focus group discussions (FGDs) were conducted with 17 mothers/guardians of young children, five FGDs were conducted with 11 FCHVs in urban and rural settings in Kaski, and one FGD was conducted with 10 members of the Health Working Group - Association of International NGOs in Kathmandu.
- **Key informant interviews:** Semi-structured interviews were conducted with 25 high-level health, WASH and diseases surveillance professionals at central, regional and district level in Nepal. These study findings were then presented at a debriefing meeting for verification.

Briefing note

Vaccination campaigns	Routine Immunisation
<ul style="list-style-type: none"> • Lead by the Expanded Programme on Immunization (EPI) Section, Child Health Division (CHD), Ministry of Health and Population (MoHP) • Children are immunised predominantly by FCHVs (oral vaccines only) • Target group: 0 to <5years children (e.g. polio) • Vaccination at ‘vaccination booths’, held in temporary locations or in health centres, accompanied by house-to-house visits the following day • Take place once/twice a year • Planning procedures: planning workshops at national, regional and district level; orientation for health staff, FCHVs, additional volunteers and committees; advocacy/briefing meetings at lower administrative structures; micro-planning at local and districts level. • Social mobilisation through radio/television broadcasting, interpersonal communications by FCHVs, paintings, hoarding boards, IEC material distribution, miking • Campaign performance monitored by supervisors, government staff, and donor agencies. 	<ul style="list-style-type: none"> • Delivered as part of EPI, CHD, MoHP, includes the package of childhood vaccines supplied nationwide by EPI • Children are immunised by trained health staff • Target group: Mostly children <1 year of age • Based on the routine immunisation schedule, mothers bring children at least five times within the first year of the child’s life for vaccination at primary health centres, health posts, sub-health post, EPI clinic, or health camps (mobile camps in mountain areas) • Regular social mobilisation takes place to raise awareness on immunisation • Immunisation performance reported by local health institution. Annual progress produced for the Health Management Information System annual report

Findings

1. Acceptability and Feasibility: The response from participants was highly positive; challenges raised during the study related to ‘how’ and not ‘whether’ this approach should be implemented.

Front-line service providers – FCHVs: FCHVs were motivated to carry out their work because of the respect they have from community members. Their tasks include polio vaccination, assisting during routine immunisation (optional), and providing vitamin A and iron supplements, Oral Rehydration Solution (ORS), and family planning and post-natal advice. FCHVs saw hygiene promotion as part of their role and felt they would be able to carry out further activities if requested without additional volunteers. Challenges raised included the need for further training, and sufficient space, demonstration materials and refreshments for mothers/guardians attending promotion activities. FCHVs worried that hygiene promotion is not a tangible service (unlike vitamin supplements), and may be less valued by the community.

Views of recipients (mothers/guardians): Mothers/guardians were highly motivated to vaccinate, and reported that they would remain so even if travel or higher costs were involved (transport, food, absence from work). Most attended the booths having been told to do so by the FCHV, whom they trust and respect. All stated that they would be happy to stay longer after vaccination to learn how to protect their children from disease or to improve their understanding of child health, disease prevention and vaccines. They felt that FCHVs and local health workers could deliver these messages. These views strengthen the assumption that mothers/guardians of young children are particularly susceptible to health-related hygiene promotion messages.

Views of policy makers, programme implementers, NGOs and donor agencies: The integrated approach of hygiene promotion alongside vaccination was acceptable to all participants although with varying degrees of enthusiasm. Several noted the importance of hygiene and referred to the severe diarrhoea outbreak in 2009. Many felt hygiene promotion is a neglected intervention

Briefing note

Summary of views on integration of hygiene promotion into vaccination campaigns and routine vaccination			
Vaccination campaigns		Routine vaccination	
<i>Pros</i>	<i>Cons</i>	<i>Pros</i>	<i>Cons</i>
Wide reach	Mothers may not attend	Frequent contact	FCHVs are volunteers – may not attend vaccination
Social mobilisation and mass media	Limited frequency of contact	Mothers bring children (not siblings)	Resistance from stakeholders (health/ programme staff)
Cost-sharing (i.e. adding hygiene promotion into the campaign would not result in additional costs e.g. facilities, social mobilisation, FCHVs, promotion materials)	Crowded - limited space for gathering	FCHVs have more time (if supporting vaccination)	Low flow of mothers – may affect ability to deliver messages
	FCHVs busy administering vaccine	Designated space and seating	Basic health messages supposed to accompany vaccination not currently delivered effectively
	Mothers/ guardians rushing (if not pre-informed)	Mothers not rushing (opinion in village setting)	Water availability for hygiene demonstration
	Water availability for hygiene demonstration	Reinforcement of messages by health workers	
		Possibility to use variety of tools/methods	

within WASH and health programmes, and that more urgent action was required to implement the Nepal Health Sector Programme-II 2010-2015, which includes sanitation and hygiene promotion as a cross-cutting priority, and the Sanitation and Hygiene Master Plan. Hygiene promotion through immunisation programmes had not been considered in the past and this was noted by some as a “missed opportunity”. Respondents were keen to see such approaches applied strategically, and warned that hygiene behaviour change requires an extensive programme and cannot be achieved overnight.

2. Delivery mechanisms: Discussion centred on the relative advantages and disadvantages of integrating hygiene promotion into vaccination campaigns and routine immunisation, as described below:

Vaccination campaigns have a wider reach than routine immunisation since vaccines are administered nationwide on the same day. However, they occur infrequently whereas hygiene behaviours are deeply rooted and changing them requires frequent messaging sustained over a period of time. During campaigns, in which booths are nearby and vaccines are administered orally and therefore do not involve pain, children may not be accompanied by mothers but by siblings or grandparents; when mothers do attend, they are often in a hurry to leave to return to work. Policy makers and programme officials also raised concerns about placing additional requirements on FCHVs when they are already busy administering vaccines, and a lack of space at vaccination booths for promotional activities was also mentioned.

Briefing note



FCHVs at rural vaccination post, Kaski district.

In contrast, **routine immunisation** provides frequent contact between mothers and health workers; mothers usually attend immunisation clinics with children, and stay longer. Although promotion within both approaches was acceptable to mothers, some preferred routine immunisation as clinics occur more regularly and offer more chances for hygiene promotion. Mothers stated that knowing in advance about promotion activities would

“If we receive hygiene message through routine immunisation, it would be more useful because what needs to be done can be learned together with the vaccine delivery on several occasions.”

allow them to make sufficient time to participate. They preferred that promotion materials such as leaflets and posters be accompanied by exercises or demonstrations. The space and setting of immunisation clinics was deemed conducive to promotional activities, and FCHVs (the FCHVs interviewed regularly attend clinics, although

they do so voluntarily) have more time to undertake promotion activities, which can be reinforced by health workers during vaccination. Some participants noted potential for resistance from healthcare staff to the introduction of further responsibilities.

Another possibility is a combined approach, involving accompanying vaccine introduction with mass-media campaigns on the benefits of vaccination, reinforced through other social mobilisation approaches. Another option would be to initiate hygiene promotion through campaigns, followed by incorporation into routine immunisation. Additional mechanisms beyond the immunisation programme include monthly mothers' group gatherings, interpersonal communication, youth groups, school clubs etc. Information, Education and Communication (IEC) materials such as posters and leaflets, although useful, were not a preferred option by FCHVs, mothers and some donors, as these can be unclear, conflicting or patronising. Mothers/guardians also preferred inter-personal communication to printed materials.

3. Institutional arrangements, roles and responsibilities:

Participants felt the Government, and specifically the Ministry of Health and Population (MoHP), should play a strong leadership role to ensure the programme's sustainability. Several institutional 'homes' within MoHP were suggested, as well as institutional delivery structures at central, regional, district and local levels. The MoHP should also provide strategic and programmatic guidelines - a prerequisite for programme implementation - to indicate MoHP prioritisation and mandate implementation responsibilities. A curriculum for staff and FCHVs training should also be developed. Close collaboration between health, education, WASH and other sectors is essential, crucially at lower levels of administration, and will require all actors working towards joined strategic objectives.

The following barriers to implementation were identified:

- Availability and sustainability of financial resources
- Over-burdening FCHVs and health workers
- Added complexity of hygiene promotion where FCHVs do not attend immunisation clinics
- Absence of local leadership and ownership
- Possible over-reliance on overstretched local organisational structures
- Lack of enabling environment for improved hygiene practices, notably water shortages or lack of access to water

Briefing note

Conclusion and recommendations

Key actors in Nepal displayed sufficient interest to warrant piloting this approach and developing an appropriate hygiene promotion intervention. Participants felt the approach can help avoid miscommunication about the rotavirus vaccine being a ‘diarrhoea’ vaccine. Aside from diverting attention from WASH, this misunderstanding could undermine the immunisation programme itself if children still suffered from diarrhoea after rotavirus vaccination. Similar concerns have been raised in relation to typhoid vaccination by the WHO Strategic Advisory Group of Experts on Vaccines and Immunisation (World Health Organization 2010). This reinforces the recommendation by the Nepal National Committee on Immunisation Practices, that “vaccine introduction for enteric vaccines (rotavirus, typhoid, cholera) should be one component of an integral child health programme to decrease morbidity and mortality from diarrhoeal disease, including safe water, hygiene, sanitation, nutrition and IMCI” (Government of Nepal 2012). Rotavirus vaccine introduction is provisionally planned for 2016, following disease burden surveillance and serotyping.

The approach proposed in this paper identifies a number of barriers to be addressed: clear definition of institutional responsibilities and operational guidelines, financing mechanism to avoid budgetary constraints to collaboration, and inter-sectoral coordination structures at all administrative levels. Critically, all actors should operate under a joint objective. All involved should have a shared understanding of the action required to generate sustained behaviour change. Whilst immunisation can provide a useful entry point for

hygiene promotion, a comprehensive strategy to control diarrhoeal disease must be broader than any individual approach. Suggestions made on specific delivery aspects should be viewed as a starting point for discussion, rather than an exhaustive list.

Piloting of the suggested approach should take place in various settings that reflect Nepal’s diverse culture, geography, sanitation coverage levels and disease burden. Essential next steps will include assigning institutional responsibility and resources, and agreement on a set of activities. Failure to do so will constitute another ‘missed opportunity’ to enhance the health benefits of new and existing vaccines.

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FCHV administering polio vaccine at a rural health post, Kaski district.

Briefing note

Notes

- ¹ Pruss-Ustun A, Bos R, Gore F, Bartram J (2008). Safe water, better health: costs, benefits and sustainability of interventions to protect and promote health, WHO. http://whqlibdoc.who.int/publications/2008/9789241596435_eng.pdf
- ² Li Liu, Hope L Johnson, Simon Cousens, Jamie Perin, Susana Scott, Joy E Lawn, Igor Rudan, Prof Harry Campbell, Richard Cibulskis, Mengying Li, Colin Mathers, Prof Robert E Black, for the Child Health Epidemiology Reference Group of WHO and UNICEF. Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. The Lancet Online Publication, 11 May 2012. doi:10.1016/S0140-6736(12)60560-1
- ³ Li Liu, Hope L Johnson, Simon Cousens, Jamie Perin, Susana Scott, Joy E Lawn, Igor Rudan, Prof Harry Campbell, Richard Cibulskis, Mengying Li, Colin Mathers, Prof Robert E Black, for the Child Health Epidemiology Reference Group of WHO and UNICEF. Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. The Lancet Online Publication, 11 May 2012. doi:10.1016/S0140-6736(12)60560-1
- ⁴ Schlaudecker EP, Steinhoff MC, Moore SR. Interactions of diarrhea, pneumonia, and malnutrition in childhood: recent evidence from developing countries. *Curr Opin Infect Dis.* 2011 Oct;24(5):496-502.
- ⁵ World Health Organisation: 'Cholera 2010', in *Weekly Epidemiological Record*, 29 July 2011. <http://www.who.int/wer/2011/wer8631.pdf>
- ⁶ Curtis V, Cairncross S. Effect of washing hands with soap on diarrhoea risk in community: a systematic review. *Lancet Infect Dis* 2003; 3:275-81.
- ⁷ Curtis, V., Schmidt, W., Luby, S., Florez, R., Touré, O., and Biran, A. Hygiene: new hopes, new horizons. *Lancet Infect Dis* 2011; 11:312-21
- ⁸ Curtis, V., Schmidt, W., Luby, S., Florez, R., Touré, O., and Biran, A. Hygiene: new hopes, new horizons. *Lancet Infect Dis* 2011; 11:312-21
- ⁹ Preventive measures: vaccinating against rotavirus, cholera, typhoid, and measles; safe water, improved sanitation and handwashing with soap (WASH); adequate nutrition for mothers and children, such as breastfeeding and micronutrient supplementation (vitamin A and zinc). Curative measures: preventing and treating co-morbidities; oral rehydration; zinc supplementation; continued feeding; antibiotics for dysentery; and improved care seeking and case management. Source: United Nations Children's Fund (UNICEF), 2012. Pneumonia and diarrhoea: tackling the deadliest diseases for the world's poorest children. http://www.unicef.org.uk/Documents/Publications/UNICEF_pneumonia_diarrhoea_report.pdf?epslanguage=en
- ¹⁰ World Health Organisation (WHO), 2009: Rotavirus vaccine position paper, in *Weekly Epidemiological Record* 18 December 2009. http://www.who.int/wer/2009/wer8451_52.pdf
- ¹¹ Sixty-fifth World Health Assembly, resolution WHA65.17. Global Vaccine Action Plan. http://apps.who.int/gb/ebwha/pdf_files/WHA65/A65_R17-en.pdf
- ¹² See for example http://www.unicef.org/infobycountry/rwanda_62577.html, <http://health.yahoo.net/news/s/afp/britainpharmahealthcompanygsk> and <http://www.gsk.com/media/pressreleases/2012/2012-pressrelease-1064096.htm>
- ¹³ Meeting of the Strategic Advisory Group of Experts on Immunization, November 2010– summary, conclusions and recommendations http://www.who.int/wer/2011/wer8601_02.pdf
- ¹⁴ Tate, JE., Burton, AH., Boschi-Pinto, C., Steele, D., Duque, J. Parashar, UD., and the WHO-coordinated Global Rotavirus Surveillance Network, 2012. 2008 estimate of worldwide rotavirus-associated mortality in children younger than 5 years before the introduction of universal rotavirus vaccination programmes: a systematic review and meta-analysis. *The Lancet Infectious Diseases*, Volume 12, Issue 2, Pages 136 - 141, February 2012
- ¹⁵ In the case of cholera, WHO recommendations have been clearer, stating that "oral cholera vaccines are considered an additional means to control cholera, but should not replace conventional control measures". Source: WHO: Cholera Fact Sheet, June 2010. <http://www.who.int/mediacentre/factsheets/fs107/en/index.html>
- ¹⁶ Levine, M., 2010. Immunogenicity and efficacy of oral vaccines in developing countries: lessons from a live cholera vaccine. *BMC Biology*, 8:129.
- ¹⁷ Fischer Walker, CL and Black, RE. 2011. Rotavirus vaccine and diarrhea mortality: quantifying regional variation in effect size. *BMC Public Health* 2011, 11(Suppl 3):S16
- ¹⁸ Levine, M., 2010. Immunogenicity and efficacy of oral vaccines in developing countries: lessons from a live cholera vaccine. *BMC Biology*, 8:129.
- ¹⁹ Meeting of the Strategic Advisory Group of Experts on Immunization, November 2010– summary, conclusions and recommendations http://www.who.int/wer/2011/wer8601_02.pdf
- ²⁰ WaterAid, 2011. The sanitation problem: what can and should the health sector do? http://www.wateraid.org/documents/plugin_documents/the_sanitation_problem_what_can_and_should_the_health_sector_do_1.pdf



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