An opportunity not to be missed

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

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Summary

Diarrhoea remains a leading cause of under–five mortality, in part due to failures to increase access to safe water, improved sanitation and hygiene practices (WASH). Rotavirus vaccines 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. At the same time, immunisation programmes could be a useful entry point for sanitation and hygiene promotion.

- 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.** Focus group discussions were carried out in rural and urban areas of Kaski district with Female Community Health Volunteers and mothers/carers of infants vaccinated during the ongoing polio national immunisation days. A further focus group discussion was conducted among ten members of a network of international non-governmental organisations (INGOs).

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

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Twenty-five stakeholders were interviewed including policy makers (state), non-state actors (donors, International NGOs), programme implementers and service providers at national (Kathmandu), regional (western region) and district (Kaski) level. Findings were discussed with key stakeholders during a debriefing meeting.

- **Incorporating hygiene promotion into the immunisation programme was considered an acceptable and feasible approach** and is in line with the recommendations of the Nepal National Committee on Immunisation Practice. Participants favoured implementation of hygiene promotion through routine immunisation over a campaign approach, and made recommendations on institutional responsibilities, as well as the specific approach and delivery mechanisms. Consultation has now begun on piloting the implementation of hygiene promotion through routine immunisation in several parts of Nepal.

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

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Researchers in discussion with FCHVs at a health post in Kaski district.

Report

Acronyms

CB-IMCI – Community-Based Integrated Management of Childhood Illnesses

CHD – Child Health Division (Ministry of Health and Population)

DALY – Disability-adjusted Life Year

DFID – UK Department for International Development

D(P)HO – District (Public) Health Officer

DWASHCC – District Water, Sanitation and Hygiene Coordination Committee

EPI – Extended Programme on Immunisation

FCHV – Female Community Health Volunteer

FGD – Focus Group Discussion

IEC – Information, Education and Communication

IMCI – Integrated Management of Childhood Illnesses

MoHP – Ministry of Health and Population

NHSP-II – second Nepal Health Sector Programme

NID – National Immunisation Days

RWASHCC – Regional Water, Sanitation and Hygiene Coordination Committee

VDC – Village Development Committee

WASH – Water, Sanitation and Hygiene

WHO – World Health Organization

1. Background

Diarrhoeal diseases are preventable. Yet globally, diarrhoea, mostly caused by a lack of safe drinking water, sanitation and hygiene (WASH)[1] remains a leading cause of death among children under five. This resulted in the deaths of over 801,000 children in 2010 alone[2]. Diarrhoeal diseases are associated with malnutrition and may increase the risk of infectious diseases such as pneumonia[3], and impact heavily on education, attainment and wellbeing. 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 2000[4].

Major advances in diarrhoea case management have been made using interventions such as oral rehydration solutions and zinc supplementation. However, diarrhoea prevention remains a significant challenge due to failures to increase access to WASH services in areas with high disease burden. In 2010, 2.5 billion people still lacked access to improved sanitation, and almost 800 million lacked access to safe drinking water[5]. The coverage of improved water and sanitation facilities is particularly low in Sub-Saharan Africa and South Asia, with WASH-associated communicable diseases most prevalent in the same regions. Globally, around 2.4 million deaths (4.2% of all deaths) and 6.6% of the disease burden in terms of disability-adjusted life years (DALYs) could be prevented annually if everyone practiced appropriate hygiene, used adequate sanitation facilities and consumed safe drinking water[6]. Evidence also suggests that handwashing with soap can reduce childhood diarrhoea by 30-47%[7], as well as reduce other fatal infections such as acute respiratory infections[8]. Although handwashing with soap can prevent infections and save lives, it is not adequately practiced at critical times[9] causing a devastating impact in developing countries.

Tackling diarrhoeal diseases requires a comprehensive package of preventive and curative interventions. Preventive measures include vaccinating against rotavirus, cholera, typhoid, and measles; safe water, improved sanitation and handwashing with soap (WASH); and adequate nutrition for mothers and children, such as breastfeeding and micronutrient supplementation (vitamin A and zinc). Curative measures include preventing and treating co-morbidities; oral rehydration; zinc supplementation; continued feeding; antibiotics for dysentery; and improved care seeking and case management[10]. Rotavirus vaccination is a relatively new addition to the list of preventative interventions. Two

rotavirus vaccines – Rotarix and RotaTeq – have been recommended by the World Health Organization (WHO) for use in high-burden areas since 2007, and for global routine immunisation since 2009[11]. Vaccines are considered essential for reduction of rotavirus since preventive WASH measures are deemed insufficient to protect against this highly-infectious virus.

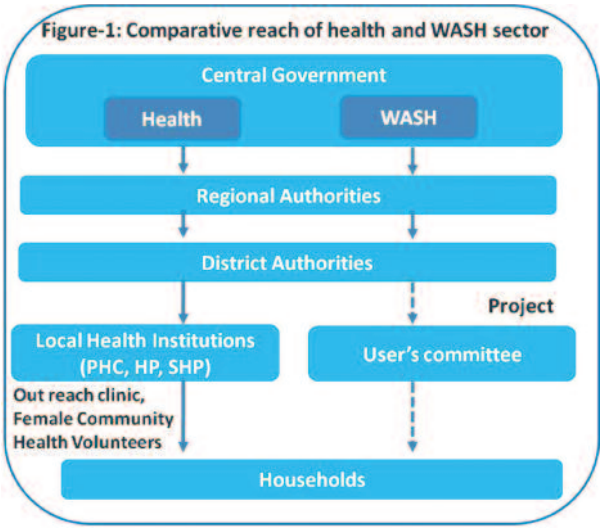
The drive for a vaccine solution to diarrhoeal diseases saw a significant boost in 2011 as part of the global 'Decade of Vaccines', which included the adoption by the World Health Assembly of a Global Vaccine Action Plan in 2012[12]. This has been accompanied by increasing availability of funding for vaccines, and the expectation that low-income countries adopt new vaccines, including rotavirus, as part of their routine immunisation programmes. The focus on a vaccine solution for diarrhoea has given rise to concerns that the existence of such vaccines may result in decreased emphasis on other essential preventative measures such as WASH, which prevents transmission of diarrhoea caused by pathogens other than rotavirus. These concerns are heightened by continuous references to the rotavirus vaccine in the media as a 'diarrhoea' vaccine. A rarely asked question, however, is whether vaccines alone can significantly reduce the burden of diarrhoea mortality and morbidity. Despite ample evidence for the impact of WASH interventions on reducing diarrhoeal diseases, it 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 a tangible, visible, immediate response to a public health issue, 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]. Rotavirus, for example, causes just over one third of diarrhoeal deaths globally[14]. It can therefore be argued that even with a perfect vaccine and perfect delivery system, only approximately one third of diarrhoeal deaths could be prevented – an impressive figure, but not when compared to the potential impact of a more holistic approach for disease prevention to address multiple causes of infectious diseases. 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. 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"[15].

WASH could potentially play a role in improving vaccine efficacy. Crucially, orally-administered vaccines have been shown to have a lower immune response in trials undertaken in developing countries than in middle/high income countries[16]. 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 countries[17]. Several factors may account for this reduced efficacy, and it has been suggested that oral vaccine response can be weakened if the child receiving the vaccine is experiencing WASH-related enteric infections, including diarrhoea and environmental enteropathy – a disorder of the small intestine that affects nutrient absorption. It has been argued that "the fundamental breakthrough [in oral vaccine immunogenicity] is likely to require reversing the effects of the 'environmental enteropathy' that is often present in children living in faecally-contaminated, impoverished environments"[18]. Further, the WHO's Strategic Advisory Group of Experts on vaccines and immunisations has recently highlighted

FCHVs at rural vaccination post, Kaski district.

"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]. Given that two of the diarrhoea vaccines, rotavirus and cholera, are administered orally, incorporating hygiene and sanitation promotion into immunisation programmes could therefore produce greater health outcomes compared with standalone interventions.

Importantly, immunisation programmes could also serve as a useful entry point for a broader approach to improve sanitation and hygiene practices, an ongoing challenge that requires long-term efforts to change deep-set behaviours and practices. A recent report by WaterAid highlighted the critical role of the health sector in promoting sanitation and hygiene behaviour change, building on the comparative advantage of health systems in terms of community-level reach and expertise in generating demand for services, compared with WASH institutions who tend to be infrastructure-driven [20]. Figure 1 illustrates differences in programme reach between the WASH and health sectors. Similarly, immunisation programmes often have an established community-level reach, in most cases greater than that of sanitation and hygiene programmes. Immunisation programmes could therefore present a mechanism by which a greater proportion of the population can be reached with sanitation and hygiene promotion, which may not only improve people's hygiene behaviours, but also result in improvements in vaccine efficacy, both of which would reduce diarrhoea overall and provide a cost-effective and results-oriented approach.



Nepal: Diarrhoea Burden and Immunisation Programme: Nepal was selected as an appropriate study site given its high diarrhoeal disease burden as well as its relatively low water and sanitation coverage status. Routine immunisation programmes have been carried out in Nepal for almost three decades, and for two decades, several successful large campaigns have been implemented to control or eliminate various vaccine-preventable diseases such as polio, neonatal tetanus, measles and Japanese encephalitis. This has led to significant progress in reducing child mortality from 162 per 1,000 live births in 1990 to 54 in 2011 [21]. According to the 2011 Nepal Demographic Health Survey, immunisation coverage in children age 12-23 months has doubled from 43% in 1996 to 87% in 2011 [22]. In order to reach the unimmunised, the Government of Nepal, Ministry of Health and Population/Child Health Division declared 2012 as the year of intensification of routine immunisation with programmes targeted at unreached populations. Behind the success of all routine immunisation and vaccination campaigns are the continuous and tireless efforts of the 52,000 female community health volunteers (FCHVs) – Nepal's public health pillars, 4,500 health personnel at different levels, and support from state and non-state actors including donors, international/national non-governmental organisations (I/NGOs) and civil society organisations. Nepal's immunisation programme is delivered through two main mechanisms: campaigns, and routine immunisation. These are explained in Section 4.2.

While immunisation programmes have been successful, WASH programmes in Nepal have resulted in varying degrees of success. As much as 57% of Nepal's population practice open defecation [23], and hygiene behaviours such as handwashing with soap are inadequately practiced. As a result, diseases such as diarrhoea, pneumonia/acute respiratory infections, typhoid, hepatitis A, skin diseases and others are prevalent [24]. In 2009, a single diarrhoea outbreak caused an estimated 371 deaths in mid and far-west Nepal [25], leading to a sense of urgency in the need to control diarrhoeal diseases. The CB-IMCI (Community-based Integrated Management of Childhood Illnesses) Programme has tremendously improved case management of diarrhoea by implementing an integrated package that addresses the management of diseases such as pneumonia, diarrhoea, malaria, and measles, as well as malnutrition, among children age two months to five years [26]. Nevertheless, diarrhoea prevention through WASH remains an ongoing challenge.

Study rationale: The combination of a well-established immunisation programme and ongoing WASH challenges lends itself to exploration of new approaches for hygiene

promotion, specifically targeting parents and carers of young children. An exploratory study was therefore designed to gather more detailed information about immunisation in Nepal and to identify the stages and mechanisms for incorporating hygiene promotion interventions into existing immunisation programmes. The study was made even more relevant by a decision by the Nepal National Committee on Immunisation Practices to recommended the introduction of the rotavirus vaccine into the national immunisation programme around 2016 (after the end of the current health sector strategy period). Rotavirus vaccination programmes will be planned based on evidence gathered on rotavirus disease burden and the most prevalent serotype.

Operational definition of 'hygiene intervention': The study utilised a broad operational definition of 'hygiene interventions', which includes the following aspects: i) handwashing with soap at critical times (after using the toilet, before preparing food, before eating and feeding the baby, after cleaning a baby's bottom, after exposure to dirt/dust); ii) food hygiene (especially weaning foods for toddlers); iii) domestic hygiene (household water treatment, management of household waste, kitchen hygiene, latrine hygiene); and iv) solid and liquid waste management. Behaviours to be included in the next phase (actual piloting) will be determined by factors such as local context, environment/setting, geography, social and cultural belief, norms, value and current practices.

2. Aim and objectives

Aim:

To ascertain whether incorporating hygiene promotion into immunisation programmes is feasible and acceptable to all key players (government, donors, health professionals, vaccination teams, front line-volunteers etc).

Objectives:

To ascertain whether oral vaccination offers a useful and effective way to promote hygiene, in order to define options for piloting and scale up.

Specific objectives:

- Assess the willingness of front-line service providers and recipients to deliver and receive hygiene messages during vaccination delivery.
- Assess the perception of different policy and programme implementation professionals from the health, WASH and diseases surveillance sectors on integration of hygiene messages into vaccination programmes.
- Determine which stage of an immunisation programme provides an opportunity for integration of hygiene promotion.
- Explore how such integration would be executed.

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

3. Methods

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) consortium (funded by the UK Department for International Development).

The study took place in central Nepal, (Kathmandu) and at regional/district level (Western region/Kaski district, 200km west of Kathmandu). The study involved field visits during Polio National Immunisation Days, focus group discussions, semi-structured interviews with key informants, and a debriefing meeting with key stakeholders.

Field visits

The study coincided with the Polio National Immunisation Days (NID), 28-29 April 2012. The study team visited eight vaccination booths in the district of Kaski in a range of urban and rural settings. The campaign was selected on the basis that the polio vaccine is administered orally, and is therefore delivered by FCHVs, unlike injectable vaccines, which are administered by trained vaccinators during routine immunisation. Kaski district has recently been declared 'Open Defecation Free', and therefore offered an opportunity to explore the approach within a relatively receptive social context, as well as to observe field-level WASH programmes. The observation served several purposes:

- To conduct discussions with vaccinators (FCHVs) and service users (mothers and other carers)
- To gain an understanding of vaccination campaign delivery in various settings
- To draw on programme settings in order to explore the practical implications of integration of hygiene promotion.

Field observation of WASH programmes was not possible due to time limitations, and therefore current hygiene promotion practices were discussed during focus groups and key informant interviews.

Focus group discussions

Nine focus group discussions were conducted with mothers/carers of young children and with FCHVs in urban and rural settings of Kaski district. The four focus groups held among mothers/guardians (two urban, two rural) involved 17 participants, including one man. All individuals approached had vaccinated their children with the oral poliovirus vaccine. Table 2 details the socio-demographic characteristics of participants in the mothers/guardians focus groups.

FCHV marking the fingernail of a vaccinated child at a rural vaccination booth, Kaski district.

In total, eleven FCHVs participated in five focus groups (three rural, two urban). FCHVs had on average at least 15 years of experience. A further focus group discussion took place in Kathmandu and involved ten members from different organisations belonging to the Health Working Group of the Association of International NGOs.

- **Mothers/Guardians:**

Participants for focus group discussions (FGDs) were identified at campaign vaccination booths. Vaccination booths were randomly selected using a list of registered vaccination booths in Kaski district. Mothers/guardians were approached after vaccination and invited to participate in a focus group. Once a number of individuals had assembled and consented to participate, the focus group discussion was carried out. A structured questionnaire was used to collect the perspective of participants on oral vaccination campaigns, their understanding of the causes and prevention of diarrhoea, and their views on the incorporation of WASH promotion messages into immunisation programmes and prospective willingness to participate in hygiene promotion activities during vaccination.

- **Female Community Health Volunteers (FCHVs):**

FCHVs play an important role in contributing to a variety of key public health programs, including family planning, maternal care, child health, vitamin A supplementation/ de-worming and immunisation coverage. They are the foundation of Nepal's community-based primary health care system and are the key referral link between the health services and communities. FCHV participants were identified at vaccination booths during Polio National Immunisation Days in Kaski district. Using a semi-structured questionnaire (open ended), their views on the structure of vaccination campaigns, their roles in the campaign and the community, their views on the acceptability and feasibility of incorporating hygiene promotion into campaigns and programmes, and delivery methods, their potential roles and mechanisms for hygiene promotion were sought.

- **Association of International Non-Governmental Organisations:**

One focus group discussion was held in Kathmandu with members of the Health Working Group of the Association of International NGOs, using an unstructured discussion to seek their views on policy and programme implementation aspects of incorporating hygiene promotion into immunisation programmes.

Key informant interviews

Eighteen Semi-structured interviews were conducted with 25 health, WASH and disease surveillance professionals at central, regional and district level in Nepal including 12 policy makers and programme implementers from nine different organisations, ten professionals from six donor agencies and three international and national NGOs (excluding those ten who were involved in the FGD). Experts were selected based on their experience and with the aim of including individuals with different perspectives and degrees of influence (Table 1). Contact was made with all key informants in advance, during which a briefing note on the study background and objectives was provided. Key informants were questioned about their opinion on the acceptability and feasibility of integrating vaccination activities and hygiene promotion, whether through routine vaccination or vaccination campaigns.

Table 1: Overview of data collection tools used by participant type

Type of participant (total 63 participants)	Data collection
Policy makers and programme implementers (Health, WASH and disease surveillance) (12 participants)	Semi-structured interviews, Central (Kathmandu), Regional (Western region) and District level (Kaski District)
Donor agencies (10 participants)	
International and national NGOs (13 participants)	Focus group and semi-structured interviews, Kathmandu
Mothers/guardians (service users) (17 participants in four FGDs)	Focus groups – urban and rural settings, Kaski District
Female Community Health Volunteers (FCHVs) (service providers) (11 participants in five FGDs)	

Table 2: Socio-demographic characteristics of mothers/guardians (n=17)			
Variable			
Age (years):			
	Upper limit	50 years	
	Lower limit	19 years	
	Median age	27 years	
		Frequency	**Percent (%)**
Education level:			
	None	1	6
	Primary	2	12
	Secondary	11	65
	Higher Secondary and above	3	18
Occupational Status:			
	Housewife	14	82
	Teacher	2	12
	Business	1	6

Written consent was obtained by signature from all study participants using an information form read by or to all participants in the appropriate language (English or Nepalese). Language and cultural practices were taken into consideration through the employment of a Nepalese member of the study team, as well as additional translation services procured for the duration of the field-based study. Consent was also obtained for recording and photography of focus group discussions /interviews. Ethical approval was obtained from the Nepal Health Research Council and from the London School of Hygiene and Tropical Medicine prior to the start of the study.

Debriefing meeting

A national stakeholders debriefing meeting was held in Kathmandu, with the participation of senior policy and programme staff, at the end of the study visit, to a) communicate and validate study findings; and b) discuss study implications and next steps in terms of policy and programme measures.

4. Findings

The results are organised into two sections: 4.1 – acceptability and feasibility of integrating hygiene promotion and vaccination from the perspective of front-line service providers, mothers and policy makers and programme implementers; and 4.2 – an exploration of how such integration could be realised.

4.1 Acceptability and Feasibility of Integrating Hygiene Promotion and Vaccination

The overall response from all study participants at the various levels was highly positive; any challenges raised during the study related to 'how' and not 'whether' this approach should be implemented. Discussion centred on the relative advantages and disadvantages of integrating hygiene promotion into campaigns and routine immunisation.

Front-line service providers FCHVs are motivated by the respect and trust afforded to them within communities as a result of their role. FCHVs' tasks include delivery of polio vaccinations, assisting health workers during routine immunisation, providing vitamin A supplements, iron tablets, Oral Rehydration Solution (ORS), family planning and post-natal advice. FCHVs indicated that hygiene promotion comes under their role; for example, as part of their role under the CB-IMCI programme, FCHVs currently

advise mothers on diarrhoea prevention. FCHVs would most likely act on instructions received from the authorities responsible for their training and supervision. One participant stated: "If a decision is taken by government to promote hygiene alongside vaccinations, then we will do it". Despite being generally supportive, reservations were expressed about how and when hygiene promotion should take place. FCHVs were mainly concerned about the need for further training on hygiene promotion: "Anything we know, we can tell the mothers; we cannot tell what we don't know. We forget without more training" [municipality setting]. Other concerns included practical issues such as the need for sufficient space, handwashing demonstration materials and refreshments for mothers/guardians attending promotion activities, in order to deliver hygiene promotion successfully. All FCHVs stated that no additional volunteers would be required in order to implement the approach, and that hygiene promotion could be enhanced within their existing work. They were, however, concerned that mothers may not be receptive to hygiene promotion, stating that "If we give mothers too many messages [rather than tangible help], they blame us and say 'you take money but you don't give us anything'" [municipality setting] [27].

Mothers/guardians: All mothers/guardians were highly motivated to vaccinate their children, pointing out that this motivation would not be reduced even if they had to travel further, or undertake a higher cost (since vaccines are provided free of charge, these costs relate to costs associated with attending vaccination booths/clinics, such as transport, food, cost of absence from work/household chores, etc). One participant said: "I never compromise with my child's health. I don't bother about the location of the booth and whether it is near or far, I prefer to vaccinate the child wherever it is. I would rather miss my work but I won't miss the vaccination date to immunise my child". All stated that they would be happy and willing to receive any information that will enhance their ability to protect their children from disease. In that respect, one mother stated that "if in future, children suffer from serious illnesses, it would cost more than coming here [for vaccination] now". Another noted that "work is not more important than children – we would travel for any health message or vaccine". Importantly, most participants, especially in rural settings, stated 'being told by the FCHV' as the main reason for attending the vaccination booth on the day. A high degree of trust in and respect for the volunteers was noted.

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

All respondents would be willing to stay longer to receive hygiene promotion messages during the vaccination programme to improve their knowledge on child health, disease prevention, and specific vaccine-related messages. One respondent noted that "any new messages related to child health are always good; if informed early, we could stay longer and listen to them properly for our own child's health and future", and another stated: "I will be interested to hear about the messages related to the vaccine and its associated disease on the very same day so that I can remember better". They stated that knowing in advance of any activities planned alongside vaccination would enable them to allow sufficient time to participate, so that they did not miss out on any relevant activity due to time constraints. These views strengthen the assumption that mothers/guardians of young children may be particularly susceptible to health-related hygiene promotion messages.

Policy makers, programme implementers, non-governmental organisations and donor agencies

The concept of Integrating hygiene promotion and vaccination was acceptable to policy makers and programme implementers. There was strong recognition that hygiene and sanitation are essential for good health and respondents commented that "sanitation and hygiene are not politically loaded, most people have children who get sick, so promoting sanitation and hygiene through a broad movement is feasible". At the decision-making level, there was particular emphasis on the impact of low water and sanitation coverage and poor hygiene practices on the health of Nepal's population, and several references were made to the 2009 diarrhoeal outbreak. As a specific component, many felt that hygiene promotion is a neglected intervention within both WASH and health programmes, and that more urgent action was required to redress this. Several high level policy makers stated that the second Nepal Health Sector Programme (NHSP-II, 2010/2015) has become an important entry point as sanitation and hygiene promotion have been included as a cross-cutting priority for the programme over the next five years, and the development of a 'WASH in Health strategy' is a priority action. It was highlighted that the Sanitation and Hygiene Master Plan also urges the promotion of hygiene involving multiple sectors through their respective programmes. It was revealed that the integration of hygiene into immunisation programmes has not been considered in the past, except for one attempt in Rautahat district during the 2010 NID programme, in which hygiene promotion leaflets were distributed alongside vaccine delivery. One high-level policy maker stated: "we have not thought of integrating WASH into vaccination programmes; this is a missed opportunity". This was further recognised by a government official and respondents from one donor agency. Ad hoc attempts to make these links, such as in Rautahat, were mentioned, and respondents were keen to apply the approach in a more planned and strategic way.

None of the participants argued that the approach was wholly infeasible, although levels of enthusiasm varied with the extent to which practical challenges were noted. Challenges raised pertained to the choice between vaccination campaigns and routine immunisation settings, the institutional arrangements and roles and responsibilities, the need for tailoring hygiene promotion approaches to different geographical and cultural settings, the added work burden for FCHVs and health staff, financial sustainability, and the need for technical guidelines. Participants were also concerned that hygiene behaviour change cannot be achieved overnight and would require an extensive programme that would need to extend beyond a vaccination contact point.

Opinions on the relative advantages and disadvantages of integrating hygiene promotion into vaccination campaigns and routine immunisation are discussed below and displayed in table 4.

4.2 Exploration of how integration could be realised: Aspects for consideration

During general discussions about the feasibility of integrating hygiene promotion into immunisation programmes, a number of issues were raised:

Potential delivery mechanisms

The practicalities of integration of hygiene promotion into immunisation programmes were discussed in the context of the current delivery mechanisms – campaigns and routine immunisation, outlined in table 3.

National polio immunisation day poster.

Table 3: Summary of current vaccination programme delivery mechanism

Vaccination campaigns (e.g. Polio)	Routine vaccination
• Lead by the Expanded Programme on Immunization (EPI) Section, under the Child Health Division, MoHP • Children are immunised predominantly by FCHVs (if the vaccine is administered orally) • Target group: Mostly children aged 0 to 5 years (e.g. polio) • Vaccination mostly through 'vaccination booths', held in temporary locations or in health centres, accompanied by house-to-house visits the following day, during which FCHVs visit households to vaccinate children missed the previous day • Usually once or twice a year (depending on the nature of the campaigns) • Campaigns follow certain planning procedures: planning workshops held at national, regional and district level; orientation for health staff, FCHVs, additional volunteers and different committees; and advocacy/briefing meetings at Village Development Committee (VDCs)/Municipalities (lower administrative structure), micro-planning at local and districts level • Social mobilisation through FM Radio and television broadcasting, interpersonal communications by FCHVs to the community, paintings, hoarding boards, posters/IEC material distribution, and miking (using an electronic high volume device) • Campaign performance is monitored by supervisors, government staff, and other relevant agencies including donors	• Delivered as part of the Nepal Expanded Programme on Immunization (EPI) under the Child Health Division, MoHP, and includes the package of childhood vaccines supplied nationwide by EPI • Children are immunised by trained health staff • Target group: Mostly children under one year of age • Based on Nepal's current routine immunisation schedule, mothers should bring their child at least five times within the first year of the child's life to a vaccination post/clinic/booth in order to ensure the child is fully immunised. • Ideally, children are brought by mothers/guardians to immunisation clinics held at primary health centres, health posts, sub-health post, EPI clinic, health camps (mobile camps in mountain areas) • Regular social mobilisation • Immunisation performance reported by local health institution. Annual progress produced for the Health Management Information System annual report

Both approaches to vaccination delivery were deemed to contain elements that can usefully support hygiene promotion. A comparison of respondents' views on the relative merits or disadvantages of the two vaccination delivery approaches for hygiene promotion is provided in Table 4, and discussed below.

Vaccination campaigns were noted to have a wider reach than routine immunisation since vaccines are administered nationwide on the same day. Campaigns are accompanied by social mobilisation and mass media activities that ensure broad buy-in and participation; additionally, respondents noted that hygiene promotion messages could be attached to campaigns with little or no additional costs.

However, several considerations make campaigns an unsuitable mechanism for hygiene promotion; importantly, campaigns are infrequent, while hygiene behaviours are complex and deeply rooted and hygiene behaviour change requires frequent messaging sustained over a long period of time. A campaign delivered only twice a year would therefore be insufficient. Although mothers/guardians were happy to received hygiene information during both campaigns and routine immunisation clinics, some noted that: "if we receive

Table 4: Summary of respondents' views on integration of hygiene promotion into vaccination campaigns and routine vaccination

Vaccination campaigns		Routine vaccination	
Pros	***Cons***	***Pros***	***Cons***
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	

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. If we wait for a campaign, it only happens once or twice a year. If we missed that time then we will again need to wait for another year". Practical challenges exist as well; FCHVs are busy administering vaccinations, especially in the more crowded urban settings, and may therefore be unable to deliver promotional activities, especially if the flow of people to the booth varied during the day. Further, in many cases mothers may not accompany children to vaccination booths as these are relatively nearby, and the vaccines are administered orally and therefore do not cause pain to the child. In many cases, children are accompanied by older siblings or grandparents. When mothers do attend vaccination booths, they are often in a hurry to leave to return to their home or work. Another practical consideration is the lack of space at vaccination booths to gather a group of people and deliver promotional activities.

Routine immunisation: Several factors made routine immunisation the preferred delivery mechanism for hygiene promotion. Participants noted the frequent contact between mothers and healthcare providers during routine immunisation, the fact that mothers accompany children during immunisation, and that mothers tend to stay longer, having made time in their schedule to attend the clinic knowing that queuing and waiting time is to be expected (although the flow of mothers can be low at times). Practically, routine immunisation clinics offer more space and seating than temporary vaccination booths used during campaigns,

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

making promotion more convenient. The setting is also deemed to be more conducive to using a broader variety of promotion tools and methods, such as posters, films and handwashing demonstrations.

Vaccines are usually administered by trained personnel rather than FCHVs. The FCHVs questioned regularly attend routine immunisation clinics to assist health workers in organisational tasks, such as holding the babies, leaving them free to undertake promotion activities, and for promotion messages to be reinforced by health workers during vaccination. However, one participant questioned whether this would happen in reality, asserting that "our health workers give basic health messages, and although they are supported to do this it doesn't happen properly". Another warned that since FCHVs are now allowed to provide treatment, they prefer to provide these tangible services instead of promotional activities. Furthermore, although FCHVs at times attend routine immunisation clinics to provide support to health workers, they do so voluntarily and it cannot be assumed that they would do so consistently. Ongoing hygiene promotion by FCHVs at clincs would therefore require the necessary policy and role description changes. Some participants were concerned about the potential for resistance from healthcare staff to the introduction of further programme components, such as hygiene promotion, into their work schedule. One respondent stated that "their primary concern is to vaccinate".

One respondent provided a useful summary of the various issues involved: "Nothing is impossible; we should make this integration feasible for the benefit of the Nepali children... Since 1998, we have been testing the stool of children to detect the polio virus but we never told people to construct a toilet to manage child's faeces and wash their hands with soap. Polio eradication could have been much easier if we could have realised such integration since its inception. In up to 12 rounds of [Polio] National Immunisation Days, we never thought to include hygiene messages through vaccination programmes but we have tried in 13th NID in one district (out of 75 districts); but we have realised that distributing leaflets could not change the people's behaviours and we haven't done anything in the 14th NID. There are opportunities through ongoing vaccination campaigns like polio along with forthcoming rotavirus vaccine introduction, but 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 – all this should be decided in advance".

Delivery of hygiene promotion will consist of:

- If delivered through oral vaccination campaigns: mothers/guardian will receive at least two opportunities to receive hygiene messages; FCHVs deliver the hygiene messages. Hygiene activities will take place in static booths where vaccination campaigns are held. Using the annual reach target for NID, approximately 4.2million mothers/guardians can be reached once or twice a year.
- If delivered through routine immunisation: mothers will receive at least five contact opportunities with hygiene activities (additional if any other community intervention conducted) in one year (the first year of the child's life); FCHVs will deliver hygiene messages, which will then be reinforced by vaccinators/health staff. Hygiene promotion will take place at local health institutions or any EPI clinic or health camp settings. Using the annual reach target for EPI (based on 2011 census data), approximately 700,000 mothers can be reached, with an estimated five visits each.

Several participants noted that a **combined approach** will be needed; for example, should the rotavirus vaccine, or indeed any other new vaccine, be introduced, the general population would expect to be well-informed about this new vaccine, its purpose and any potential side effects in advance of its introduction. Therefore, a mass-media communication campaign, similar to those traditionally applied prior to vaccination campaign, targeted at the entire population and carrying strong hygiene promotion messages as well as the vaccine-specific links, could deliver messages that can then be reinforced during routine immunisation of very young children [28]. Other social mobilisation approaches such as rallies and street theatre could also help reinforce these messages, especially in areas where access to media is unreliable (e.g. where an unreliable electrical supply limits access to radio and television).

Hygiene promotion methods: A variety of hygiene promotion methods were mentioned, such as: mothers' groups gatherings, especially alongside outreach clinics (FCHVs are expected to run monthly mothers' groups meetings); interpersonal communication by FCHVs and health workers, and within youth groups, school clubs and rotary clubs; and social mobilisation tools such as songs, street theatre, film and handwashing demonstrations. FCHVs were less enthusiastic about the use of traditional Information, Education and Communication (IEC) materials such as posters and leaflets, as these could be deemed by community members as patronising, or may not be clear enough, although they could be useful under some circumstances, for instance posters positioned next to handwashing stations in public areas. Mothers/guardians also expressed a desire that communication be inter-personal and not in the form of a leaflet. Participants preferred to learn through practical demonstration and several also mentioned TV and radio, together with direct person-to-person communication from FCHVs, health staff and others. One donor agency noted that there is a lot of fragmentation in terms of hygiene promotion IEC materials, with a lot of overlap and conflicting messages.

Institutional arrangements, roles and responsibilities
Discussions on institutional arrangements took place with all participants except mothers and FCHVs. All participants stated that the Government of Nepal should play a strong leadership role to ensure sustainability, and that institutional responsibility must lie with the Ministry of Health and Population (MoHP). Participants explained that "Government involvement makes it easier to implement programmes sustainably", and that "tasks that do not sit clearly within a specific ministry do not get done". However, simply having a ministerial lead was deemed insufficient for successful implementation, and participants argued that there should be a clear institutional 'home' along with allocated financial and human resources.

Various options for institutional responsibility within the MoHP were suggested:

- **Child Health Division (CHD) – EPI (Extended Programme on Immunisation) section** *EPI is responsible for executing all routine and supplementary immunisation activities in the country.*
- **Child Health Division – IMCI (Integrated Management of Childhood Illnesses) section** *The IMCI programme is delivered throughout the country and is responsible for control of diarrhoeal disease.*
- **National Health Education, Information and Communication Centre (in coordination with CHD)** *Responsible for executing all health promotion programmes, independently and/or in coordination with the division/section responsible for a particular programme.*
- **Primary Health Care Revitalisation Unit (in coordination with CHD)** *A recently established division tasked with enhancing primary health care and initiating innovative programmes within the Ministry.*

Participants argued that it is essential that any decision on which institution should lead this initiative be made at the central level, and that the 'centre' must also provide

strategic and programmatic guidelines. One NGO representative stated that "once it is incorporated into government policy and guidelines, it can be implemented by partners".

Beyond the institutional lead, participants emphasised the need for close collaboration between the health, education, WASH and other sectors in order for the approach to be successful and sustainable. One participant noted that "coordination, collaboration and cooperation are beautiful words, but different institutions have different priorities – for this to work, we all have to work towards the same priority" – highlighting the need to formulate strategic objectives to which all sectors adhere and can be held accountable to. Inter-sectoral collaboration was deemed particularly relevant at the lower levels of administration where programmes are delivered.

The following structures were suggested:

- **At central level:** one Technical Advisory Committee with high level participation from different sectors (health, WASH, education) and agencies (state and non-state actors). The agreed lead institution under MoHP should be responsible for establishing the coordination structure
- **At regional level:** the Regional Health Directorate should act as overall lead, and should establish coordination with existing WASH coordination bodies such as Regional WASH Coordination Committees (RWASHCC).
- **At district level:** the District (Public) Health Officer (D(P)HO) should act as overall lead, and should coordinate with and reinforce existing bodies such as the District WASH Coordination Committees (DWASHCCs). The District Health Office should be responsible for district-level planning and training of trainers.
- **At local level:** local health institutions [e.g Primary Health Clinic, Health Promoters and School HP] should take overall lead, and utilise existing structures such as Village Development Committees (VDCs), FCHVs, mothers groups, WASH users committees/Village WASH Coordination Committees, school clubs, Parent-Teacher Associations, Rotary clubs etc. Local health institutions should assist in the training of FCHVs, and should reinforce and build upon the role of the VDCs in leading the total sanitation movement.

The use of programmatic guidelines is a prerequisite for implementation of any programme or programme revision of the MoHP. These guidelines will act as a clear indication of priority from the Ministry, as well as mandating the relevant institutions and agencies to implement the approach. A curriculum of training for FCHVs and other relevant health staff should be developed to accompany the guidelines, and was considered a necessary measure not only for the implementation of this specific approach but also in order to improve the engagement of health personnel overall on environmental health measures for disease prevention.

Researchers Katie Greenland and Om Prasad Gautam conducting a focus group discussion with parents, Pokhara.

Barriers to implementation

Potential barriers were identified at all levels:

- Several respondents raised concerns about the availability and sustainability of financial resources for additional programming, as well as the effective mobilisation of resources to ensure hygiene promotion is delivered consistently across the country.
- Concern was raised about over-burdening the FCHVs and the long-standing nature of a behaviour change programme that would change their 'voluntary' status as well as the fact that the FCHV programme has not been evaluated so it is not known whether FCHVs themselves have latrines or whether they lead by example in terms of sound hygiene practices. In districts or villages where FCHVs do not regularly attend immunisation clinics, promotion messages may need to be carried out by trained health workers, adding another degree of complexity to the approach.
- Some donors asserted that the lowest levels of leadership and administration should be involved to generate local ownership. One respondent stated that "In the mid-far west, for example, VDCs allocate a third of their budget to sanitation – they're not waiting for government resources", although this may not be the case in other regions.
- Some raised concerns about the over-reliance on local organisational structures. For example, although "mothers' groups are at times seen as support arm for FCHVs" and are meant to meet on a regular (monthly) basis, therefore providing a useful forum for information dissemination, these groups are not active in all areas and not every FCHV is active within them. Similarly, one NGO respondent noted that "District WASH Coordination Committee members are overstretched – they are the same people who also deal with many other community issues and we need to be aware of this".
- Donor agencies and non-governmental organisations were also concerned about the enabling environment, particularly the availability of soap and water for demonstrations and sustained practices. This was also raised as a wider concern about how to promote handwashing in the absence of water. "Even some of the staff in our own office have difficulty, especially in the dry periods, even for bathing and washing. You can imagine what it is like for the others".

Piloting

Interest was shown by both state and non-state actors to pilot the integration of hygiene promotion into vaccination programmes in Nepal. Concerns were raised about the geographic and cultural variation in Nepal, resulting in discrepancies in attitude and practices relating to hygiene in different contexts. Some group-specific social and cultural practices related to use of sanitation services and practice of good hygiene behaviour were also highlighted. It was suggested on more than one occasion that the approach should be piloted in more than one region. A WASH sector and health sector organisation both expressed willingness to pilot such an approach. Some felt that high-risk areas should be targeted, while others thought it better to first perform a 'proof of concept' study in a less challenging district. It was also suggested that this could be a good opportunity to test different approaches and see which works best. Some discussed the timeline for undertaking these activities, suggesting that if the approach is to be implemented in 2016 to coincide with the introduction of the rotavirus vaccine, the piloting should start by 2014 to give sufficient time for programme design and implementation by 2016.

The essential elements of identification of focal division/section, definition of institutional roles/responsibilities, development of programme guidelines and standard operating protocol, and of hygiene promotion packages and mechanisms, must be addressed before piloting and programmatic integration can be initiated.

5. Discussion

Despite the apparent 'win-win' scenario that the incorporation of hygiene promotion into immunisation programmes presents in theory, the acceptability of this approach to decision makers, programme implementers and beneficiaries of hygiene programmes could not be assumed. Alongside identifying whether such an approach would be acceptable, the study aimed to explore how it could be feasibly implemented, including the optimal delivery mechanism. Although it was originally intended to investigate only the campaign approach for vaccine delivery, this was revised during the study to consider routine immunisation activities following feedback from participants.

Participants were overwhelmingly positive about the merits of integrating hygiene promotion into immunisation programmes. Discussions therefore focussed predominantly on aspects of feasible delivery

FCHVs holding the National polio immunisation day poster.

and not whether or not incorporation of hygiene into immunisation programme was needed. The fact that this approach was deemed as an opportunity that has been missed in the past was an encouraging indication that participants could see the value of the approach within the Nepal context. In several cases, study participants were not aware of the existence of a rotavirus vaccine and the intention of the Government of Nepal to introduce the vaccine into its immunisation programme in the coming years, but discussing this vaccine with study participants helped clarify the purpose and timing of the study. Although a number of advantages and disadvantages for integrating activities into routine vaccination and vaccination campaigns were identified, the general consensus was that efforts should be primarily focussed during routine immunisation. Such an approach would fit with the fact that the rotavirus vaccine, as and when it is introduced, is likely to be delivered through the routine schedule in accordance with WHO recommendations, and this would be a natural time to complement vaccination with hygiene promotion messages, avoiding miscommunication about the rotavirus vaccine as a 'diarrhoea' vaccine, which could harm behaviour change initiatives and move attention away from WASH as primary prevention measures for most causes of diarrhoea. Miscommunication could also harm the sustainability of the immunisation programme itself; one respondent pointed to the introduction of the Haemophilus influenzae type B (Hib) vaccine in Nepal, during which the vaccine was referred to as a pneumonia vaccine, causing parents to lose trust in the vaccine when children still became ill with pneumonia. Similarly, the marketing of the rotavirus vaccine as a diarrhoea vaccine could lead to mistrust if, after vaccination for rotavirus, children still became ill with diarrhoea [29]. This finding reinforces the decision of 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" [30].

The strength of opinion held by different participants varied considerably; some participants were sceptical until they had thought through the options and discussed challenges or clarified points, while others proved more willing to agree than to discuss. Discussion on how to realise integration highlighted the challenge of inter-sectoral collaboration (stemming from separate budgets and institutional mandates) and the need for any initiative to have a definite 'institutional home' – issues that must be addressed in order for the approach to be developed further. It was apparent that the sectors do not need to be restructured, but better organised, and ongoing challenges of intersectoral coordination require addressing. The urgency that drove the intersectoral collaboration after the 2009 outbreak must be kept in

mind and built upon. Many key players could prove willing partners but a sustainable financing mechanism that will help avoid budgetary constraints to collaboration needs to be developed.

Discussion also took place on what 'hygiene promotion' would entail and who would deliver the interventions. It is important that all stakeholders have a shared understanding of the first aspect: it was pointed out by a number of key stakeholders that behaviour change cannot be achieved by simply handing out a flyer during routine immunisation, or by a few minutes of one-on-one didactic teaching. Indeed, the authors of this study would envisage that vaccination would provide a useful entry point for a comprehensive strategy to control diarrhoeal disease. Participants felt that FCHVs would be the obvious choice for delivering promotional activities, but that they cannot deliver every aspect of a programme, and a number of other structures exist and could be effectively utilised. It was reported that FCHVs themselves are indeed willing to undertake such work provided that they receive capacity building and programme-specific training. This could give an opportunity to align hygiene promotion activities currently taking place and to avoid delivery of conflicting messages. The suggestions proposed by the various actors should not be seen as an exhaustive list, but merely as a point from which further discussion could ensue while considering the reach, influence, capacity etc. of each contact point or organisation.

The necessary strategic mechanisms such as the setting up of a Technical Advisory Committee at national level, designation of institutional lead, development of policy directives and programme guideline, establishment of sector and cross-sectoral coordination, and strengthening front-line health workers/FCHVs' capacity to execute such initiatives, are seen as strategic decisions, which must be made by the MoHP if the approach is to be implemented. The NHSP-II and Sanitation and Hygiene Master Plan provide a solid policy platform to initiate hygiene promotion in a more comprehensive and cohesive manner in Nepal, and this proposed approach offers an opportunity to start putting these into practice.

The comparative merits of the existing vaccine delivery mechanisms as an entry point for hygiene promotion activities were discussed. The emerging conclusion favours routine immunisation, while a combination of the most relevant aspects of both campaign and routine mechanisms would be ideal. Specifically, the locations at which EPI clinics are held, such as health

Om Prasad Gautam conducting a focus group discussion with parents, Pokhara.

institutions, schools and community centres, were deemed more suitable than the temporary booths set up for campaign purposes, as they allow better seating arrangements and more space for practice demonstrations. Further considerations relate to the amount of time that FCHVs tend to have to deliver promotional activities, the likelihood of mothers attending EPI clinics as opposed to vaccination booths, and the time mothers would be willing and able to spend at either of these.

It should be noted that all observations made in this study regarding oral vaccines delivery mechanism, set-up of booths, willingness to participate and work on this initiative by FCHVs, and views of mothers relate to Kaski district, and can therefore not be generalised to the rest of Nepal, given the country's diverse cultural, social and geographic settings. Kaski has also been declared 'open-defecation free', and informal questioning and health centre statistics on disease prevalence indicate that diarrhoeal diseases are not a major health problem in the communities visited, contrasting greatly with other settings in Nepal, in which sanitation coverage can be lower than 20% and the burden of WASH-associated diseases is very high. As suggested by many respondents, a hygiene promotion initiative of this type would need to be developed and piloted in more than one region of Nepal. Whether a region should be selected because implementation would be more or less challenging should be debated as this approach is further developed, and piloting should begin at least two years prior to implementation.

6. Conclusion

The study met its primary objective of determining whether integration of hygiene promotion and vaccination delivery would be feasible and acceptable. Although a number of aspects must be considered carefully, key actors including state (government) and non-state (donor, INGOs/NGOs), as well as frontline service providers and the beneficiaries of immunisation programmes displayed sufficient interest to warrant piloting this approach and developing an appropriate, context-specific hygiene promotion programme in Nepal. Such a pilot or demonstration project should begin soon as the development and implementation of a nationwide programme based on piloting may take two years; this timeframe will be even more relevant should the Government of Nepal decide to introduce the rotavirus vaccine into its routine immunisation schedule in 2016. Piloting should be undertaken in a variety of settings to reflect Nepal's diverse culture, geography, sanitation coverage levels and disease burden. Discussion at the global level could enhance the quality of piloting and allow exploration of the relevance of integration of hygiene promotion into immunisation programmes in other countries.

A crucial next step will be to decide at the central level how the pilot and subsequent programme will be financed, to assign a responsible body to coordinate this initiative, to ensure commitment of key stakeholders, and to decide on and develop deliverables to which all collaborators can be held accountable. It is clear that many study participants felt that the failure to implement such an approach in the past has been a missed opportunity that has delayed the health benefits of ongoing programmes. This approach offers a potentially effective way to capitalise on the opportunities provided by the advent of new vaccine technology to create a lasting, broader benefit for Nepal's population.

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