Technical Report

Prevention of Acute Diarrheal Illnesses in "at-risk " Areas of Nepal – A Sustainable Approach

SUBMITTED TO

Epidemiology and Disease Control Division
Department of Health Services
Ministry of Health
Teku, Kathmandu

SUBMITTED BY

Rotary Club of Nagarjun
Kathmandu, Nepal

Partners

Lead by:

Epidemiology and Disease Control Division
Department of Health Services
Kathmandu, Nepal

Implemented by:

District Public Health Office
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Group for Technical Assistance (GTA), Kathmandu, Nepal

Foreword

Cholera outbreaks may occur following natural disasters mainly due to contaminated water, food and poor sanitation. It can be controlled by timely management of cases, access to potable water, maintaining the food hygiene and environmental sanitation, and community engagement. The World Health Organization (WHO) recommends that oral cholera vaccination can be considered ina high-risk area of choleraas the preventive tool.

Comprehensive and integrated interventions on Water, Sanitation and Hygiene (WASH), vaccination and health promotion are important in order to address the problem of cholera outbreaks in the country. Therefore, multisectorial integrated interventions are needed to deal with the problem of cholera outbreaks. In addition to WASH, Oral Cholera Vaccine (OCV) is one of the tools toprevent and control cholera.

Cholera has remained the public health significant disease in Nepal and it took thousands of lives for years. To support the effort of Government of Nepal in the prevention and control of cholera - Rotary Club of Seoul Southwest, Rotary Club of Nagarjun, Rotary International, International Vaccine Institute (IVI), and Group for Technical Assistance (GTA) supported the Epidemiology and Disease Control Division, Department of Health Services, Ministry of Health (MoH) to conduct a mass vaccination campaign administering OCV to at ‘high risk’ population in Udarapur and Sonapur Village Development Committees (VDCs) and Ward No 5 of Nepalgunj municipality of Banke district. This report highlights planning, implementation and the lesson learned from the OCV campaign that took place in November to December 2016 targeting a population of 28135 individuals aged one year and above.

Pratap Singh
Past President
Primary Contact person

Acknowledgements

The vaccination campaign was implemented with the assistance of Rotary International (Rotary Global GrantGG1527228),Rotary Club of Seoul South West, DPR Korea, International Vaccine Institute (IVI), DPR Korea, Johns Hopkins University (JHU), Baltimore and Group for Technical Assistance (GTA) Nepal under the leadership of Epidemiology and Disease Control Division (EDCD) of Ministry of Health,Nepal. Above all, the field implementation of this campaign was led by District Public Health Office Banke on close coordination with active involvement of all health workers in targeted VDCs (Sonpur and Udharapur) and Nepalgunj municipality ward 5.

The Rotary Club of Nagarjun would like to express its appreciation for the support it has received from Rotary International, Rotary Club Seoul South West, Rotary Club of Gwangju-Ipseog, International Vaccine Institute (IVI), Johns Hopkins University (JHU) and Group for Technical Assistance (GTA) Nepal.

The club would also like to acknowledge the effort and dedication that were shown by the team that worked tirelessly to implement the campaign in the field.

Pratap Singh Thakuri
Past President
Rotary Club of Nagarjun
Primary Contact person ‘Prevention of Acute Diarrheal Illness in "at risk" areas of Nepal – A Sustainable Approach’

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Acronyms

AE	Adverse Event
AEFI	Adverse Event Following Immunization
AGE	Acute Gastroenteritis
DDA	Department of Drug Administration
DG	Director General
DHO	District Health Office
DoHS	Department of Health Services
DPHO	District Public Health Office
EDCD	Epidemiology and Disease Control Division
FCHVs	Female Community Health Volunteers
GoN	Government of Nepal
GTA	Group for Technical Assistance
IEC	Information Education and Communication
IPC	Inter personal communication
IVI	International Vaccine Institute
JHU	John Hopkins University
LMD	Logistics Management Division
msl	Mean Sea Level
MoH	Ministry of Health
OCV	Oral Cholera Vaccine
RI	Rotary International
SAE	Serious Adverse Event
SWOT	Strength Weakness Opportunity Threat
UNICEF	United Nations International Children's Emergency Fund
VDCs	Village Development Committees
VTT	Vocational Training Team
VVM	Vaccine Vial Monitor
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

Executive Summary

An OCV campaign took place as a complementary measure to improved water, sanitation, and hygiene and health promotion in selected at risk villages for cholera outbreak in Banke district. The vaccination campaign was conducted in two rounds. The first round started on 29th November through 3rd December 2016 and the second round took place between 17th December through 21st December 2016 (Mop-up: 4th – 8th January 2017).

The campaign targeted a population of 28135 aged one year and above in a cluster of selected high risk villages of possible cholera outbreaks. The Rotary International donated 55000 doses of vaccine to Ministry of Health, Government of Nepal (GoN) to implement the vaccination program.

This vaccination campaign was organized with active mobilization of Female Community Health Volunteers (FCHVs) and health workers at various vaccination sites. Tally sheets, daily summary sheets and Adverse Event Following Immunization (AEFI) reporting forms were used to record data at each vaccination site and respective health facilities.

During the first round 25546 people out of 28135 targeted were vaccinated (90.79 % coverage). During the second round 26912 people received the vaccine out of 28135 (95.65 % coverage). In overall, the coverage was satisfactory with percentage of those taking two doses was 85% and second dose by those who received OCV in first round was 93.95%. There was no serious AEFI reported. There was no issue with taste of the vaccine and was not considered any barrier to its acceptance in the community.

The campaign has set a basis for future prevention and control / eliminate cholera.

1. Background

Cholera is an acute diarrheal disease caused by ingestion of food or water contaminated with the bacterium Vibrio cholerae. The short incubation period of two hours to five days, enhances the potentially explosive pattern of outbreaks. The disease results in significant morbidity and mortality in populations with lack or inadequate access to safe drinking water, and sanitation. Every year, there are an estimated 3–5 million cholera cases and 100000 – 120000 deaths due to cholera. Cholera continues to be a public health problem in developing countries. Prevention of cholera through proper environmental management, and improved hygiene and sanitation practices can be complemented by the use of the safe, effective, and affordable OCV.

1.1 Cholera in Nepal

The first scientific report on cholera in Nepal was published in May of 1886 [2] and it is still one of the most important causes of acute diarrhea in Nepal. The largest cholera outbreak reported in Nepal, with more than 30,000 people affected, was in the Mid-Western Development Region in 2009. Tragically, more than 100 people lost their life during the outbreak. [3] Recent outbreaks occurred during the 2014 monsoon in Rautahat, the region adjoining northern states of India and in Kathmandu valley after the devastating earthquake of 2015. [4, 5] However, it is generally understood that there is under reporting of cholera because of inadequate or lack of robust surveillance covering all parts of the country. Every year, there are reports of cholera outbreaks from rural and urban locales, including parts of the country that are remote and difficult to access area with compromised water, sanitation and hygiene condition. There is a pattern of regular outbreak reported from hill districts of the mid-western and far western development regions due to poor water

Figure1: Geographical location of Banke district in administrative map of Nepal

and sanitation conditions and inadequate service delivery preparedness. Following natural disasters like flooding, landslide, Tsunami and Earthquake, there occurs destruction of infrastructure including water supply, sanitation and hygiene with displacement of population to temporary settlements or camps. This situation increases the risk of communicable diseases outbreaks including cholera.

1.2 Banke district

Banke district with an area of 2,337 square kilometers lies between Bardiya, Salyan, and Dang districts of Nepal and Baharaich district of India. Geographically, the majority of the district (79.1%) are plains {< 300 Mean Sea Level (msl)} while 20.6% of land is within 300 to 1,000 msl. Only 0.3% of land in Chure hills in the North reaches an altitude up to 1,236 msl [6]. Banke district is a rural district with 85% of its 0.49 million population [7] living in the 46 VDCs and only 15% in its sole municipality — Nepalgunj.

Due to the open boarder with India, there is massive flow of population across the border based on evidence and expert consultation, there are considerable numbers of people who cross the border seeking aid, nutrition, and health care in Banke district. The mid-western development regions where the Banke district lies have the lowest sanitation coverage at only about 30%. This contributes to their higher rates of diarrheal diseases.

1.3 Demographic and Health Profile of Banke District

Demographic and health indicators of the population in the Banke district are shown in Table 1.

Table 1: Banke district demographic and health profile

Indicator	Data
Population size (n)	491,313
Children under 5 yrs (n)	42,929
Urban: Rural population ratio	1:10.8
Female: Male ratio	964:1000
Literacy rate (% illiterate in Mid-western Terai)	41.7
Households with access to potable water (% of total)	52
Households owning and using improved sanitation facilities (% of total in Mid-western Terai)	30
DTP 3 coverage rate (% in Mid-Western Terai)	94
Infant mortality rate (per 1000 live births in Mid-Western Region)	58

Source: MoH, Nepal unpublished data

1.4 Prioritization of VDCs for OCV vaccination

A total of 55,000 dose of OCV was available for the vaccination through Rotary Global Grant fund. Banke district has 46 VDCs and one municipality, with a total population of 0.49 million people. Based on a survey conducted by IVI, Banke district is an identified

“Hot Spot” (IVI unpublished report). The target areas were selected based on reported cholera cases in past years, increase in Acute Gastroenteritis (AGE) in last three years and continuous sub optimal WASH status. Taking considerations of the above criteria and the availability of quantity of vaccine, a consultative meeting with relevant stakeholders, the District Public Health Office (DPHO), Banke make a decision to identify the high-risk areas for vaccination.

Thus, based on these criteria, 2 VCDs and 1 ward of Municipality were selected within Banke District. The total population for the targeted OCV campaign was nearly 28135 residing in VDCs Sonapur and Udarapur, and ward Number 5 of Nepalgunj municipality of Banke District (excluding pregnant women and children below the age of 1 year) (Table 2). Vaccination coverage target was 90% of the eligible population.

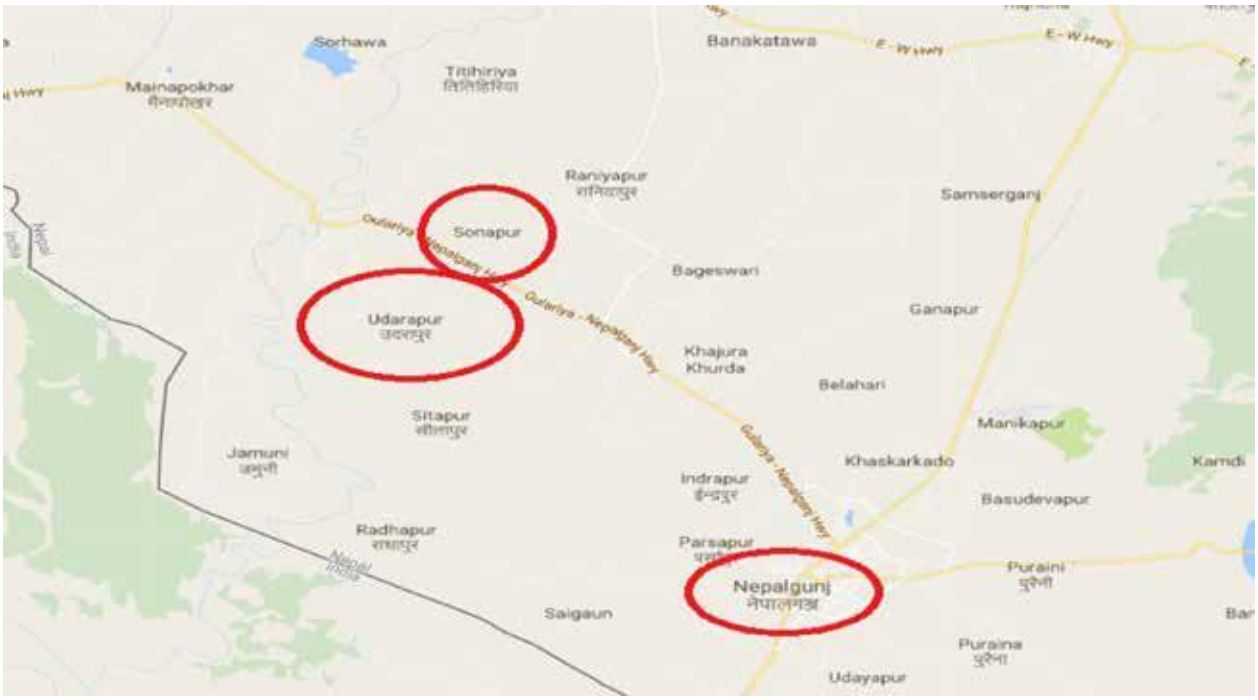

Figure 2: Locations of vaccination areas in Banke district, Nepal

Table 2: Target population by target area for vaccination campaign

Site	Total Population (A)	Expected pregnancies (B)	Children <1 (C)	Migrant population (D)	Target population {E=A-(B+C+D)}	Target pop. Est. 90% coverage (90% of E)
Sonapur	9238	111	213	488	8426	7584
Udharapur	14318	143	372	900	12903	11613
Ward 5, Nepalgunj	7311	32	115	358	6806	6126
Total	30867	286	700	1746	28135	25323

1.5 Date of Vaccination

The first round started on 29th November through 3rd December 2016 (House to house visit) while the second round was conducted during 17th through 21st December, 2016 (House to house visit). A mop up round was conducted from 4th through 8th January 2017.

2. Program Objectives and Outcomes

2.1 Objectives

Primary Objectives:

- To identify areas that are at high-risk for cholera.
- To vaccinate target population of about 28135 individuals who are above the age of one (excluding pregnant women) using the existing public health system.
- To monitor and document AEFI
- To assess the feasibility of a mass OCV campaign in Nepal.

Secondary Objectives:

- To educate and mobilize communities to help prevent the spread of acute diarrheal illnesses including cholera in the targeted areas (e.g., vaccination, hygiene practices)
- To generate data in order to assist the GoN in its decision making about a nationwide vaccination strategy to combat diarrheal diseases, particularly cholera.
- To improve the capacity of local health professionals in project area in controlling and prevention of acute diarrheal illness including cholera

2.2 Outcomes

- To achieve a vaccination rate of at least 90% for both rounds in targeted areas of Banke District, Nepal.

3. Oral Cholera Vaccination Campaign Strategy

3.1 Preparatory activities

Preparatory activities include vaccine registration and program approval by major stakeholders; finalization of the vaccination plan (target population; vaccine procurement, transport, and storage; micro-planning of mass immunization campaign including social mobilisation; and training of vaccination teams). All preparatory activities were led and coordinated by the EDCD, DoHS, and supported by Rotary club of Nagarjun, Rotary Seoul Southwest, the IVI and GTA. And all the preparatory works were implemented by District Public Health Office of Banke.

3.1.1 The OCV (Euvichol™)

EuvicholTM is the OCV vaccine used in campaign. Thia vaccine is prequalified by WHO.

Figure 3: OCV (EuvicholTM)

Vaccine type

- Inactivated OCV (EuvicholTM)

Vaccine presentation

- EuvicholTM is a single dose vial and is packed in a glass bottle of 1.5 ml per dose with Vaccine Vial Monitor (VVM) type 30. Each glass vial occupies 16.8 cm3 in volume.

Vaccine stability

- Cholera vaccine (EuvicholTM) should be kept and transported at 2-8 0C, but has been shown to be stable at ambient temperatures for 14 days at 37 0C.
- Shelf life of 24 months at 2- 8 0C.
- This vaccine should not be frozen and discard if vaccine has been frozen.

Vaccination Schedule and administration

- The vaccine is given in two doses orally at interval of at least 2 weeks. Each dose is 1.5ml and it should never be given parentally.

Vaccine registration

- Euvichol™ was registered at the Department of Drug Administration (DDA), Nepal prior to shipment of the vaccine to Nepal.

Vaccine procurement, transport and storage

- The OCV was ordered from Eubiologics, Korea, and paid by the Rotary Seoul South West, Korea. It was shipped to Nepal by Eubiologics. National partner coordinated the delivery, import logistics, and transport to the central storage facility in Kathmandu of the Logistics Management Division (LMD) of Department of Health Services (DoHS), MoH, GoN. From the central storage facility in Kathmandu, the vaccine was transported immediately prior to the vaccination campaign to the district capital Nepalgunj in refrigerator van and stored at the regional storage facility in Nepalgunj. Existing cold chain storage space capacities were adequate. A 35-vial vaccine package had a volume of 588 cm3 (14cm x 10.5cm x 4cm). The volume requirements for storage in cold room or refrigerator to vaccinate 20,000 people (40,000 doses) is: 672L + 15% =772L [9]; accordingly, the storage room required for 54,000 doses was: 907L + 15% = 1,043L. Daily transport from the regional storage facility in Nepalgunj to the health posts in Udarapur, Sonpur VDCs and ward number 5 of Nepalgunj municipality was done during the vaccination days in cold boxes ensuring proper cooling of vaccines to maintain the integrity.

3.1.2 Planning of Mass Vaccination Campaign

The following coordination, advocacy and social mobilization activities were initiated from the central level to village level.

At Central level:

- Meetings of National Steering committee for Enteric Disease control: The meetings were led by Director General (DG), DoHS with the participation of relevant stakeholders. There was participation in the meeting by all key government officials, WHO, United Nations International Children's Emergency Fund (UNICEF), IVI, John Hopkins University (JHU), GTA and other relevant stakeholders. Based on the finding of risk assessment for potential cholera outbreak, the committee decided for preventive vaccination in conjunction with WASH activities in high risk areas of Banke district.
- Central level Planning Meeting: This meeting was conducted with participation of Epidemiology and Disease Control Division (EDCD), District Health Office (DHO), IVI and GTA. The meeting finalized the strategy for vaccination, target population and plan the activities with timelines.
- Finalization of Guidelines and Information Education and Communication (IEC) materials: There was a technical group to develop and finalize the vaccination guideline and also prepare IEC materials required for the successful social mobilization activities.
- Central level orientation, training and planning meeting, where different governmental agencies and international organizations were invited for their participation. The key objective of this meeting was to coordinate and advocate at the central level for efficient conduct of the vaccination.

At District level:

- District Micro-planning workshop: This workshop was conducted to develop the micro-plan as in other previous campaigns like in Polio or Measles Rubella campaign. This meeting focused on the mapping for the villages with all socio - demographic and required information for vaccination micro plan. Based on information available, the detailed micro plan for each target areas was developed using the planning templates in the **Annex 1.**
- District Health cluster meeting: This committee included all the relevant stakeholders like health / WASH and key local development partners. The key responsibility of the cluster was for planning and implementation of post disaster relief activities including disease outbreaks. Distribution of vaccines, IEC materials and other logistics to villages: The most important part of the campaign was the timely and efficient distribution of vaccine along with other logistics at the booth level and was done according to the microplan as in **Annexes 2.**
- District level coordination and advocacy meeting: The key objective of this meeting was to coordinate and advocate at the district level. In this meeting, the key stake holder in the district were invited and oriented regarding the vaccination.
- Performance review of First round and planning for 2nd round: This meeting was conducted to review the performance of the first round and Strength Weakness Opportunity Threat (SWOT) analysis was shared by each health facility incharge. This review was very effective to improve the performance of the second round by correcting the gaps in first round.

At Village level:

- VDC planning and FCHVs/volunteers orientation: The orientation meeting was conducted using the implementation guideline and the micro-planning was conducted using designed templates as in **Annexes 3.** This meeting was participated by FCHVs, Volunteer and local health workers. The FCHV orientation was conducted by practical exercise on how to manage booths, social mobilization activities and recording reporting functions.
- VDC level coordination and advocacy meeting: The key objective of this meeting was to coordinate and advocate at the village level. In this meeting, the entire key stake holder in the villages were invited and oriented regarding the vaccination.
- Advocacy with schools: The orientation of the campaign was given to school teachers of the target areas. The posters were displayed and pamphlets were distributed in the school **(Annex 4)**

3.1.3 Social mobilization

The messages for social mobilization activities for the OCV campaign were to ensure the target population are fully aware about risk of cholera and the importance of the vaccination. The main messages for campaign were as follows:

Key messages:

The following messages were disseminated through every possible medium at personal level or using social media available at local level

- Health education core messages
  - Wash your hands
  - Use latrine for defecation
  - Use clean water and food

- Key community messages
  - Inform public how vaccines can complement clean water and hygiene and the need for two doses for a complete regimen
  - Though OCV has been shown to be safe, all community members should know to return to vaccination or health posts for any adverse events following immunization.

- How to disseminate message?
  - Inter personal communication (IPC) through volunteers– FCHVs and other volunteers disseminate why, when, where and who related to vaccination and distribute the invitation card.
  - IPC through health worker - The local health workers meet with community leaders, school teachers and mothers' group and social workers and other stakeholders on why, who, when and where related to vaccination.
  - Distribution of pamphlets: The pamphlets will be distributed extensively through volunteers to inform local community about cholera vaccination. These pamphlets were distributed to key people in the community.
  - Use local press: Use the local media before and during the campaign for spreading the messages of the cholera vaccination campaign, for example by inviting them in local level coordination meeting. Develop messages carefully to clear out any misconceptions that people may have about OCV.
  - Use of common meeting places for spreading the information about the campaign. By choosing the right timing, the message reaches many people at once. School children were informed through headmasters and teachers about the dates, target groups and sites of the campaign. Parents, besides other channels, be informed through their children.
  - A Vocational Training Team (VTT) comprising a team leader from IVI, and members from IVI and Rotary Korea actively participated in training and educating the health care workers and community in before and during the vaccination period.

A training workshop was organized for all members of the vaccination teams and included background education on cholera, the EuvicholTM OCV, cold chain requirements, and campaign objectives, as well as instruction on implementation strategy and logistical

execution of campaign activities. The training was led by EDCD, DPHO, Banke in close coordination with IVI, Rotary Nepal and its local technical partner. Training content was guided by the WHO publication, *Oral cholera vaccines in mass immunization campaigns: guidance for planning and use* [9] and the UNICEF *Cholera Toolkit* [10].

3.2 Conduct of mass OCV campaign

A cholera vaccination guidelines was prepared and adapted to the local setting. All campaign activities were coordinated by EDCD and DPHO, Banke and supported through IVI and Rotary Nepal.

On vaccination days, teams were provided with appropriate means of transport to reach the individual households in the vaccination area. Vaccines was transported from regional storage facility in Nepalgunj to health centre of Udarapur and Sonpur village and ward number 5 of Nepalgunj municipality on day of vaccination in cold boxes and each team carried the required number of vaccine from the health centre and visit every household in the vaccination area to administer the vaccine. Since each vaccine vial has a VVM, vaccine temperature monitors were not required in the boxes. [9, 11] The VVM of Euvichol™ was 30, with medium stability. The vaccine manufacturer recommended storing and transporting the vaccine at 2-8°C at all times, which was followed during the campaign.

Each vaccination team comprised of trained three members:

1. A team leader – medical or paramedical staff ideally governmental EPI staff or FCHV person responsible for filling in tally sheets (Annexes 5) and signing the vaccination card.
2. Vaccinator – Person responsible for administration of vaccine.
3. Health educator - Person responsible for filling in and signing the vaccination card and communication of health education messages.

The health education message included an overview on cholera as well as detailed information about the rationale of the campaign, the vaccine, and the importance of a two-dose schedule. A particular emphasis was put on the importance of hygiene and proper sanitation for diarrheal disease prevention as well as treatment of water during the rainy season. The inability for OCV to protect against other diarrheal diseases was communicated and underlined through educational material. The team coordinated with EPI program activities as needed to ensure that the OCV campaign does not interfere with routine immunizations. The team leader was responsible for supervising activities and attending to patients presenting with adverse events — if any.

3.2.1 Vaccination

Vaccination cards were handed out to individuals during administration of 1st dose. Vaccine recipients were asked to present the card again during second round to verify their identity and 1st dose date before receiving the 2nd dose two weeks later. Each card had a unique

identifier **(Annexes 6).** Age and sex and address of all vaccinees were registered on tally sheets by the vaccination team. Eligible individuals who come from places outside the target area were also be given the vaccine; registration were done on different tally sheets. Before administration, the VVM was checked to ensure stability of the vaccine. The vial was discarded if the VVM is decayed. Prior to vaccine ingestion, vaccinators asked each participant if (s)he has fully understood the information given and was able to ask any question that (s)he may have about the mass vaccination and whether all his/her questions have been answered.

Existing manual on surveillance of adverse events following immunization was utilized to follow up Adverse Event (AE) and Serious Adverse Event (SAE), if any, that require treatment was managed by the medical leader of the team. Participants were also encouraged to report any AE happening in the three days following vaccination to health workers at the respective public health care facilities.

The second dose was administered at the same vaccination site 14 days after the first dose. During the second dose, the vaccination teams also emphasized the continuous need for layered prevention measures.

3.2.2 WASH Activities

Rotary club of Nagarjun conducted the orientation to health workers, FCHVs and volunteers on hygiene promotion. Community awareness program was conducted through street drama, counselling and school based demonstration on hand washing.

3.2.3 Waste management

The proper planning was done for appropriate waste collection and disposal at the beginning of the vaccination campaign.

Wastes were sorted out by type: i) Glass: empty OCV vials, ii) Metal: OCV vial cap and iii) Rubber: rubber stopper. All the empty vials collected in a plastic bag that were disposed in the pit. The rubber caps and the aluminium covers were also collected in a separate plastic bag and disposed in the pit.

Waste management was guided by national guideline of Nepal and WHO [9].

4. Achievement against Target

4.1 OCV Coverage in First and Second Round by area

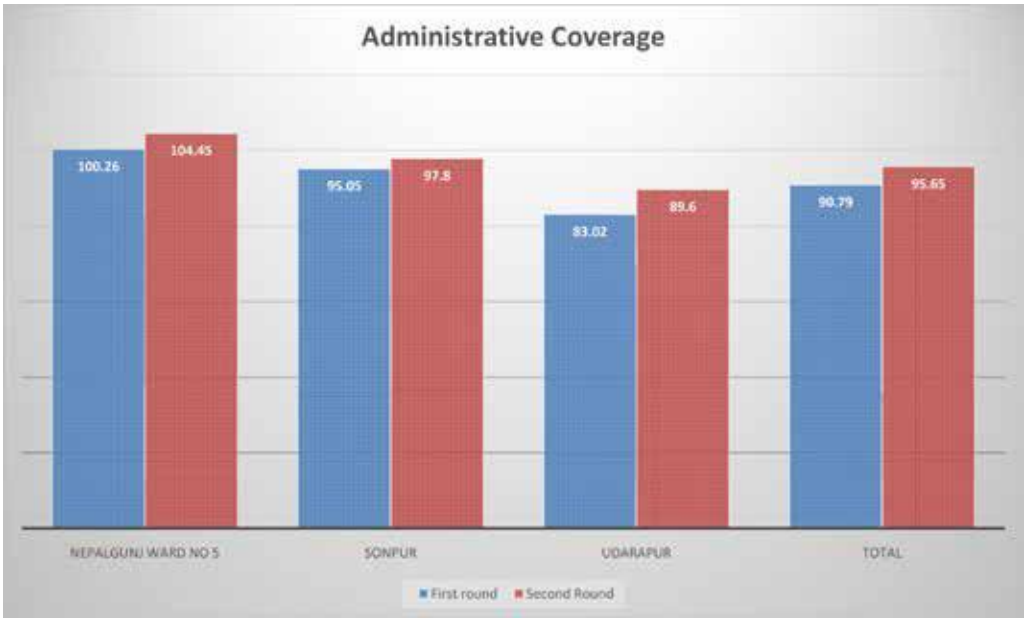

Figure 4: First and Second Round Oral Cholera Vaccination administrative coverage data Sonapur, Udarapur and Nepalgunj ward No 5 – 2016

In the first round, the overall achievement was 90.79 %. The site with highest coverage was Nepalgunj ward No 5 (100.26%) and Udarapur (83.02%) was the area with the lowest coverage. While in the second round, the overall achievement was 95.65 %. Coverage by sex and age, in both the rounds is given below in **Table 3 and 4.**

Table 3: OCV coverage in 1st Round Oral Cholera Vaccination

Municipality/VDC	1-4 years		5-14 Years		>15 Years		Total
	Male	Female	Male	Female	Male	Female	
Nepalgunj ward 5	340	265	1037	952	1937	2293	**6824**
Sonpur	560	577	1242	1200	1947	2483	**8009**
Udarapur	681	641	1662	1638	2391	3700	**10713**
	1581	**1483**	**3941**	**3790**	**6275**	**8476**	**25546**

Table 4: OCV coverage in 2nd Round Oral Cholera Vaccination

Municipality/VDC	1-4 years		5-14 Years		>15 Years		Total
	Male	Female	Male	Female	Male	Female	
Nepalgunj ward 5	376	278	1068	991	2019	2377	**7109**
Sonpur	587	584	1192	1204	2000	2674	**8241**
Udarapur	745	639	1700	1783	2708	3987	**11562**
	1708	**1501**	**3960**	**3978**	**6727**	**9038**	**26912**

4.2 Two Dose Coverage

The total number of individuals who received 2nd dose of OCV during second round was 24001, which was 85% of the target population and 93.95% of those who received OCV in first round.

4.3 Single dose coverage

The total number of individuals who took only single dose equaled 4456 in total as shown below

Table 5: Number of individual receiving single dose in both rounds

(Total Achievement in first round) minus (those who received only 2nd dose in 2nd round) [A]	Those who received only single dose in 2nd round [B]	Those who received 2nd dose in mop up round [C]	Total number of those who received only single dose [A +B-C]
1545	2911	722	3734

4.4 Coverage Survey

Coverage survey and rapid convenience survey of the campaign is planned and being conducted by Johns Hopkins University (JHU) and Group for Technical Assistance (GTA). A report of the survey will be published separately.

4.5 Monitoring of AEFI

AEFI was monitored at all vaccination sites as well as the respective health facilities. AEFI reporting forms were distributed to all health facilities with the aim of monitoring and reporting any events that could be reported in those facilities. It is pleasing to note that no single minor and serious adverse event was reported against the OCV. However, there were few cases of spitting out and also very few numbers of reported vomiting. More importantly, the taste of the vaccine was not barrier for its acceptance in the community.

4.6 Post vaccination activities

A sharing meeting was conducted after completion of the vaccination to disseminate the findings with stakeholders. MoH also acknowledged the contribution of all stakeholders and presented a token of appreciation during the sharing meeting.

5. Funding and Technical support

The financial support for implementation of the vaccination campaign was supported by Rotary Club of Nagarjun, Rotary Club of Seoul Southwest through Rotary Global Grant. International Vaccine Institute (IVI) and Group for Technical Assistance (GTA) provided technical support during the entire campaign.

6. Sustainability of the oral cholera vaccination program

Epidemiology and Disease Control Division, Department of Health Services, Ministry of Health led the oral cholera vaccination campaign was conducted successfully by District Public Health Office at Banke district. The activities conducted by the program that supports the sustainability are as follows;

i) Infrastructure Development on water and sanitation

Ministry of Water Supply and Sanitation, Government of Nepal has endorsed the National Water Safety Plan, Sanitation and Hygiene Master Plan and national guideline on safe drinking water for the improvement of hygiene and sanitation practices. It will need long term activities. All district government line agencies and non-governmental / private sectors should follow the policy and guideline for the improvement of WASH condition.

ii) Government ownership and engagement

Epidemiology and Disease Control Division, Department of Health Services, Ministry of Health had taken the leadership andDistrict Public Health Office implemented the oral cholera vaccination program at Banke district. With the experience and skills gained from this campaign, health workers and FCHVs are capable of conducting similar kind of vaccination program in future.

iii) Capacity Building

Rotary club of Seoul South West, DPR Korea and Rotary club of Nagarjun and with support from International Vaccine Institute and Group for Technical Assistance conducted the capacity building activities such as Training of Trainers (ToT), trainings and orientations. The target groups for the ToT were district level health workers, trainings were municipality/ VDCs level health workers and orientations were FCHVs and other volunteers. A total of 126 health workers and other volunteers were trained from the Voluntary Training Team. The trainingcurriculum was mainly focused on oral cholera vaccination and hygiene promotion.

The learnings from the trainings were reflected during the campaign. The trained team can impart knowledge to their colleagues, co-worker and can improve the hygiene condition of the community in long run. District Public Health Office has regular hygiene promotion program in their regular activities. So, they will continuously working for the improvement of hygiene practice in at high risk community.

iv) Cholera preparedness and response plan

Ministry of Health, Government of Nepal has developed the five-year National preparedness and response plan for acute gastroenteritis / cholera outbreaks in Nepal. It was developed mainly for the prevention and timely response of the disease. Evidence from the oral cholera vaccination campaign at Banke was also referred during the development of the plan.

v) Multisectorial Partnership

The campaign was success due to the partnership and involvement of stakeholders from multisector. Health sector was leading the program while education, local government and water supply and sewerage section were supporting the program. All the sectors are committed for the prevention and control of cholera in coordination and collaboration.

vi) Advocacy

Central and district level advocacy were done for the vaccination and WASH at the community and for the well-being of the local people. Government authorities and non – governmental partners were sensitized for long term activities for vaccination and hygiene promotion.

7. Strengths, Challenges and Lessons learnt

7.1 Strengths

- There was a Strong commitment and ownership from GoN and EDCD
- Risk assessment for potential cholera outbreaks was very useful to prioritize the high risk areas
- All the partners worked as a single team and implemented the agreed single plan under the leadership of EDCD. Effective coordination and collaborations with partners at central level
- Strong and dedicated district leadership and participatory planning were key to success of campaign. There was effective coordination with other INGOs and local NGO
- Effective monitoring from the supervisors, daily tracking and monitoring of daily progress in both round (Local Health Worker, DHO, EDCD, IVI, GTA)
- Effective social mobilization through interpersonal communication through school/FCHVs and health worker, distribution of posters and brochures to schools
- Vaccination activity was integrated with WASH counseling

7.2 Challenges

- Prioritization of high risk areas was challenging due to limited surveillance and the quantity of vaccine availability

7.3 Lessons learnt

- The OCV vaccination in the targeted area has been successfully implemented with a coverage of more than 90%. Implementation of campaign has been shown to be feasible using the existing public health system of GoN
- The effective collaboration and participation of partners from the beginning of the planning phase has remain crucial in the successful conduction of OCV campaign

- Local health workers and FCHVs play a key role to the success of OCV Campaign
- The key to the success of the campaign is quality micro planning and its effective implementation at the community level

8. Conclusions

The successful implementation of OCV campaign in targeted villages of Banke represents a public health milestone in the control of cholera in Nepal. The existing public health care system is capable of delivering high coverage of OCV in the community with short and effective planning phase. OCV vaccination in conjunction with effective WASH activities can control potential cholera outbreak in high risk areas. The campaign has set a basis for further campaigns of similar nature in the future.

9. Bibliography

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10. Annexes

1. District level micro planning Forms and formats for OCV vaccination campaign 2.1. District level logistic information required for OCV vaccination
   2.2. District level requirement of Cold Chain and IEC materials
   3.1. Forms and formats for village level micro planning for OCV vaccination campaign
   3.2. Mapping of the OCV vaccination plan at ward / village level
   3.3. Village level logistic information required for OCV vaccination
   3.4. Village level requirement of Cold Chain, IEC materials and others
   3.5. Reporting form for OCV campaign
   3.6. VACCINE ACCOUNTABILITY LOG
   3.7. Supervision Checklist
   3.8. Adverse event following OCV immunization
4. Posters and pamphlets used for OCV campaign (in Nepali)
5. Tally Sheet (in Nepali)
6. Vaccination card
7. Photo Memories

Annex I District level micro planning form for OCV vaccination campaign

Target population, vaccinators& other team members, vaccination booth, high risk areas (settlements/camps/special communities) and supervisor at district level

VDC	Total population (a)	EPI target (b)	Target population (c = a – b)	No. of vaccinators	Booth Location	High risk areas (settlements/ camps/special communities)	Supervisor
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
Total							

Annex II District level logistic information form

2.1 District level logistic information required for OCV vaccination

Vaccine			Logistics		Forms			
1st dose	2nd dose	Total dose	Zip lock plastic bag	Forceps	Tally sheet	Reporting form	RCS	AEFI form

2.2 District level requirement of Cold Chain, IEC materials and others

Cold chain			IEC materials			
Vaccine carriers						
Permanent	Temporary	Ice packs	Banner	Posters	Pamphlets	Invitation letters

Annex III Forms and formats for village level micro planning

3.1 Village level micro planning form (s)

Name of Village / Health Post:

Target population, vaccinators& other team members, vaccination booth, high risk areas (settlements/camps/special communities) and supervisor at village level

Ward no	**Total population (a)**	**Under one year population (b)**	**Target population (c = a – b)**	**Name of vaccinators**	**Booth Location**	**High risk areas** (settlements/ camps/special communities)	**Supervisor**
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
Total							

3.2 Mapping of the OCV vaccination plan at ward / village level

LEGEND

3.3 Village level logistic information required for OCV vaccination

Vaccine			Logistics		Forms		
1st dose	2nd dose	Total dose	Zip lock plastic bag	Forceps	Tally sheet	Reporting form	AEFI form

3.4 Village level requirement of Cold Chain, IEC materials and others

Cold chain			IEC materials			
Vaccine carriers						
Permanent	Temporary	Ice packs	Banner	Posters	Pamphlets	Invitation letters

3.5 Reporting form for OCV campaign

Date:

District/PHC/HP: ..... VDC / Ward: .....

TotalTarget population ..... Total no. of Vaccination booth:.....

Health Institution [District / VDC level]	Population information related to Vaccination											OCV vaccine (Single dose Vial)		Vaccine waste rate (%)	Remark
	Total target pop	Age wise target Population			Total pop. Vaccinated (n / %)							Received (n)	Returned (n)		
		1 to 5 yrs (n)	5 to 15 yrs (n)	> 15 yrs (n)	1 to 5 yrs (n)	5 to 15 yrs (n)	> 15 yrs (n)	Achievement (%)							
								1 to 5 yrs (%)	5 to 15 yrs (%)	> 15 yrs (%)	Total (%)				

IF you come across any programmatic challenges or if you devised any solution to address those challenges, please write down below:.....

Prepared by:…….. .....Signature:.....Office Stamp

Date:

Verified by: …….....Signature:…….....

Date:

Note:

After the completion of the vaccination campaign, all the health centers should collect all the vaccination reports from all vaccination booths in the wards and report it compiled to the district (public) health office. Similarly, the district (public) health office should also report the compiled report to Regional Health Directorate, Epidemiology and Diseases Control Division and Child Health Division.

Date	Total no. released	Mode Transportation	Date	Total no. returned	Mode Transportation

I confirm the above information is correct.

Date: .....

Name:.....Signature: .....

3.7 Supervision Checklist

Name of Site:.....

	1st site		2nd site		3rd site		4th site		5th site	
	yes	no	yes	no	yes	no	yes	no	yes	no
Community participation										
People are gathered at the vaccination site										
Site Organization										
Site is identified by banner										
Full vaccination team at site										
Sufficient vaccine supply at site										
One-way crowd flow is established at site										
Vaccinator shakes the vial gently before opening										
All the vaccine in the vial is fed										
Vaccinator is informing second dose date										
Are new tally sheets available and being used?										

Cold Chain										
Is there functioning cold chain available (cold box/refrigerator)?										
Vaccine are kept in cold box/refrigerator										
Ice packs are in cold box										
Adequate vaccine and supplies available										
Random check vial indicates freezing? (If yes, report immediately to higher level to investigate).										
Waste Management										
Cap is dropped into waste bag after opening										
Vaccine vial is discarded in the waste bag just after empting										
Other wastes are collected in separate bag										

Supervisors Name_____

Signature_____

Date_____

3.8 Adverse event following OCV immunization reporting form

Date of report:		
		Age: **M /F:**
> 3 years old: yes/no	**Pregnant: yes/no**	**Immune compromised: yes/no**
District:	**Village:**	**Ward:**

Vaccination target areas			
Dates of vaccines	**First:**	**Second:**	
Date AEFI started:		**Onset interval:**	
History /Complaints:	**|**	**How many**	**Other complaints?**
Nausea Vomiting	Yes / No |	**times?**	
Diarrhoea Abdominal	Yes / No |		
pain Fever	Yes / No |		
Other:	Yes / No |		
Duration:	Yes / No |		
	|		

On examination:	Temp:	BP:	PR:		RR:
Name of investigator:					
Post:					
Signature:					
Date:					

Annex IV Posters and pamphlets used for OCV campaign (in Nepali)

X}HF LJ?4 XFT]DFNF]!!
X}HF /F]U ;DALGW HFGSF/L]!!

ÆX}HFÆ /F]U S] ?XF]

X}HF PS L56} ;G]{ ;?JF /F]U XF], H;N] AFNAFLNSF / JO:SSF] HOFG LNG ;S5 .

KFTNF] LB;F X'G' / JFGTF X'G' O; /F]USF] D'VO NIF0F X'G .

ÆX}HFÆ /F]U S;/L ;5{?

X}HF /F]U B'LIFT KFGL / VFGFAF6 ;B{5 .

ÆX}HFÆ /F]U NFU]SF] Z+SF NFU]DF S] ?UG{' K5{

LA/FDLNFO{ T'?GT GLHS}SF] :JF:YO ;+:YFDF PKRF/SF] NFLU N}HFG' KB{5 . OLB PLRT PKRF/ GEPDF, X}HFSF] LA/FDL DG{ ;S5 .

ÆX}HFÆ /F]U AF6 ARG S] UG{' ?KB{5

;KMF KFGL K|OF]U UG]{

/FD|F] ;FU XFT W'G]

;KMF EFF8FS'F8FX? K|OF]U UG]{

X}HF LA?4 VF]K LNG]

KLXNF] DFQFM

BF];|F] DFQFM

LHNNF HG:JF:YO SFOF{NO AFFS], G]KFN

Rotary International Vaccine Institute IVI

ÆX}HFÆ LJ?4 E/KBF]{ ;'/IFF

X}HF LJ?4 VF]K

CFˆGF] ;DK"0F{ KL/JF/ -! AIF{ DFLYSF AFNAFLNSF, DLXNF, K'?IF, JO:S B]LV H]I7 GFUL/S_ NFO{ X}HF /F]UAF6 ARFPG X}HF LJ?4 VF]K LNG' XF]NF !!

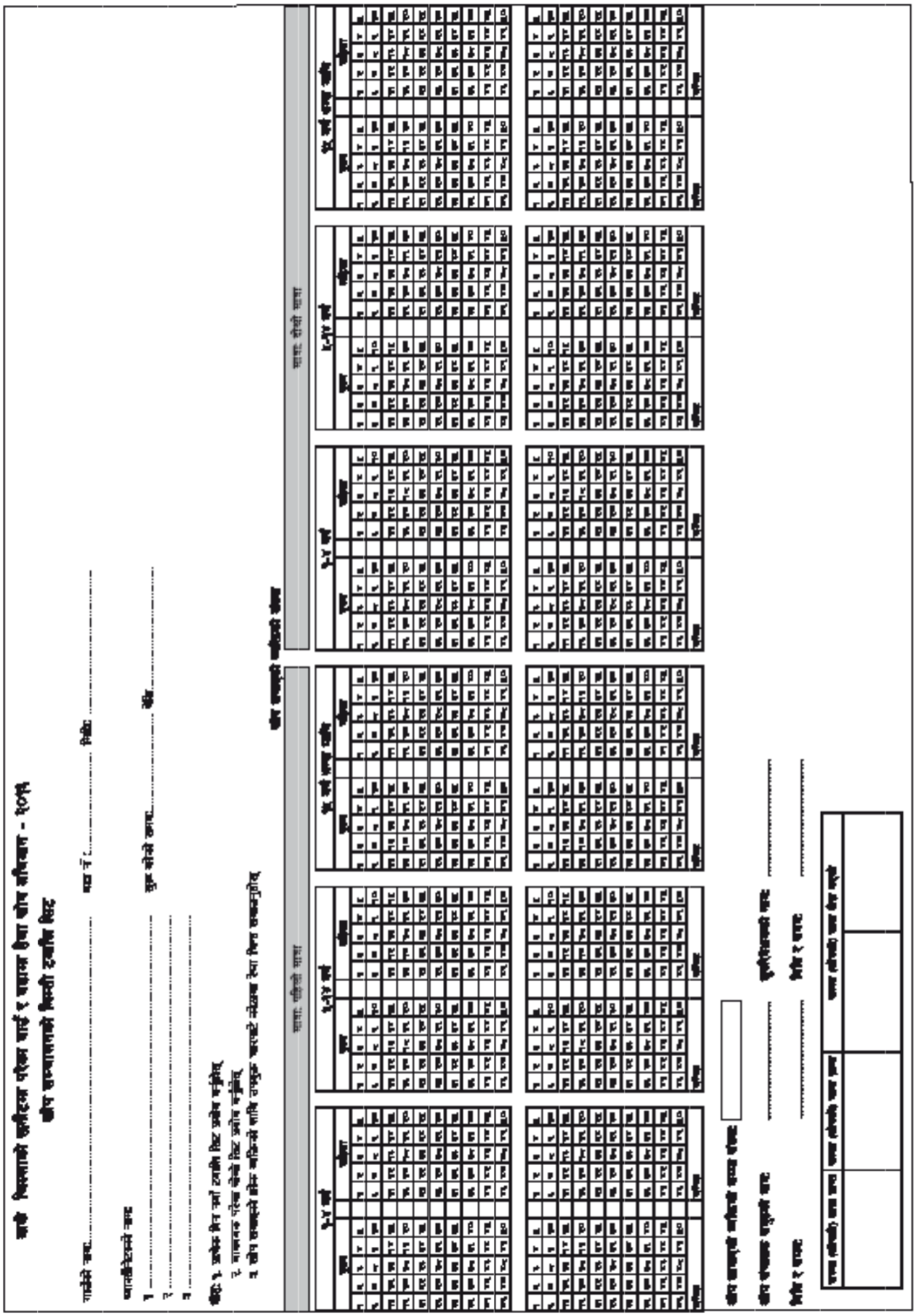
VF]K LNPKL5 LB;F KFTNF] X'G] TYF JFSJFSL NFUG] H:TF ;FDFGO NIF0F B]VF KG{ ;S5 . OF] CFKM} L7S X'G5 .

KLXNF] DFQFM D+L;/ !$B]LV D+L;/ !*;DD

BF];|F] DFQFM KF}IF @ KF}IFB]LV ^;DD

LHNNF HG:JF:YO SFOF{NO AFFS], G]KFN

Annex V Tally Sheet



Annex V Vaccination Card

G]KFN ;/SF/
:JF:YO DGQFNO

VF]K SF8{

X}HF VF]K NUFPSF] L;=GM _____

GFDM_____ PD]/ -AIF{_M_

LHNNFM_____ UFFP÷6F]NM ___

J8F GM_ 3/W'/L ;+VOFM_____

VF]K S]G›÷;D'XM_____

X}HF VF]K8F]HN6 GDA/÷DOFB ;LSG] LDLT	KLXNF] VF]K NUFPSF] LDLT BF];|F] VF]K NUFPG] LDLT
KLXNF] 8F]H	
BF];|F] 8F]H	

EMF8FKVFNF TYF X}HF /F]SYFDSF PKFOX¿





KFGL ;W} PDFN]/ KFGLDF KLO"IF JF KMNKM"N T/SF/LX¿ VFGF VFG' CL3, VFGF RKL{ ;W} ;KMF K|OF]U U/F}+ . KFGLKLO"IF+/FVL SNF]L/G]ZG :JR5 KFGLN] KVFNF}+ VFPKL5,. ARRFSF], LBZF /FVF}+ / ;W}+ ;W}+ ;KMF EFF8FDFUG{'K5{ . PS LN6/ KFGLDFVFGF /FD|F] ;FU KSFP/WF]PKL5, LBZF U/]KL5 RKL{DF DFQ LB;F 5F]K]/ /FV]SF] DFQ # YF]KF SNF]L/G VFCF}+ / VFGF /FD|/L / KMF]X/ 5F]PKL5 ;FA'G LK;FJ U/F}+ . LKPG] U/F}+ . -KLO"IF_ /FVG'K5{ . 5F]K]/ /FVF}+ . KFGLN] LDLRLDLR XFT W'G] U/F}+ .

SNF]L/G XFN]SF] CFWF 306FKL5
DFQ KFGL K|OF]U UG{'XF];\ .

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Annex VI Photo Memories

Meeting of Steering Committee for Enteric Disease Control

Stakeholders Meeting at Banke District

Vocational Training to Health worker at Nepalgunj

District Level Microplanning

Media Orientation at Nepalgunj

Welcoming of Korean Rotarian at Nepalgunj

Orientation to FCHVs and volunteers at Nepalgunj

Stakeholders meeting at Sonapur VDC

Stakeolders meeting at Udarapur VDC

Administering OCV by Dr. Bhim Acharya, Director of EDCD

Administering OCV by Rita Joshi, Regional Director of Regional Health Directorate, Mid-Western Region

Administering OCV by Khim Bahadur Khadka, Chief, District Public Health Office, Banke

Administering OCV by Rotarian from South Korea

Administering OCV by Past President of Rotary Nagarjun

Delivering OCV

Prof. Kim from Rotary Club of Seoul South West delivery speech at Nepalgunj

Sharing Meeting at Hotel Himalaya

Appreciation for successful OCV campaign from Ministry of Health, Government of Nepal

District Public Health Office,
Banke District

On Behalf of Rotary District, Nepal

On Behalf of Rotary Club of Seoul
South west, Seoul, South Korea

On Behalf of Rotary Club of
Gwangju-Ipseog, DPR Korea

Rotary Club of Nagarjun,
Kathmandu, Nepal

International Vaccine Institute,
Seoul, South Korea

Johns Hopkins University, Baltimore, USA

Group for Technical Assistance,
Kathmandu, Nepal

GG 1527228
Integrated Oral Cholera Vaccination Campaign in high risk areas of Banke District, Nepal

A Collaborative program of Department of Health Services and Rotary International

(29th November – 21st December, 2016)