Concept Note:

Assess immunization coverage and knowledge of mother/care givers towards vaccination in 13 districts (Gavi DLI based) of Nepal.

March 2024

Introduction:

Gavi Joint Appraisal 2016 proposed performance-based disbursement mechanism to disburse HSS Grant to National Immunization Program for 2016-2020. Indicators identified for assessment were related to National Health Sector Strategy (2015-2020) outcomes. The immunization indicators, i) percentage improvement in EVM score over 2014 baseline is linked to outcome 1 and ii) improved equity access to immunization services in target districts is linked to outcome 3 (Annex 1). National Immunization Program has been performing verification of DLIs to receive allocated DLI (disbursement linked indicator) tranche for year two and subsequent years of the NHSS.

National Immunization Program (NIP) conducted assessment of improved equity access in subset of 13 targeted districts in 2018. This study showed high level of coverage for all basic antigens in 12-23 months and seen adherence of full immunization declaration process as per full immunization declaration guideline. Till date, Nepal has declared full immunization declaration in 72 districts (out of 77 districts). The 13 districts linked to DLI, namely Bhaktapur, Bardiya, Gulmi, Kailali, Kanchanpur, Kathmandu, Lalitpur, Makawanpur, Manang, Mustang, Ramechhap, and Salyan declared FID (fully immunized district) by or before 2021. One district, Humla, among the 13 DLI districts, which was remaining for FID declaration has also completed FID declaration in 2023. Annex 2 shows the location of 13 districts. Annex 3 shows population and household structure of the 13 districts.

WHO Vaccination Coverage Cluster Surveys Reference Manual 2018 recommends sound survey methodology, compatible with large multi-purpose surveys, DHS and MICS, with specific guidance on vaccination coverage. DHS primarily selects women aged 15 to 49 as a primary subject and collects information on children of selected mothers to draw inference on routine immunization. However, vaccination coverage cluster survey suggests selection of eligible children and collect information from mother/caretakers which supports reducing bias, improve accuracy and precision in estimation of vaccination coverage. This survey will use methodology recommended in WHO Cluster Survey Manual to assess the immunization status of 12-35 months to assess vaccination status as per National Immunization Program schedule.

Various national population surveys show older children have lower card retention rate compared to younger children. Card retention is 78.5% and 60.9% among children 12-23 months and 24-35 months respectively though the percentage of children who ever received card was 98% in both cohort (NDHS 2022). Therefore, to reduce recall bias, only 2nd year of life vaccines will be assessed among 24-35 months age group. The expected 1st year of life coverage among these children will be higher than the assessed coverage of 2nd year of life among this age group as these children would have received all required vaccine for first year of life to be eligible for 2nd year of life vaccines.

The targeted districts - 13 low performing in FY 2013/14 are the districts with category two (high DPT-HepB-Hib 3 coverage and high dropout) and category four (low DPT-HepB-Hib 3 coverage and high dropout) are listed as targeted districts (Annex 2) for this survey. Full Immunization Declaration is a state when all children in a given

administrative area by the age of 15 months receive complete doses of vaccine as per the national immunization schedule.

Objectives:

Survey will be conducted to assess immunization coverage among 12-35 months for all vaccine included in the national immunization schedule for under-one year in the 13 low performing districts, which have been included in the DLI. The specific survey objectives are

- To estimate coverage among 12-23 months children at the time of survey for all antigens given in the first year of life in 13 districts
- To estimate coverage in 24-35 months children at the time of survey for all antigens given in the second year of life
- To assess knowledge of mother/care givers towards routine vaccination
- To assess reasons for not vaccinating for children who have not received single dose or missed one or more doses of vaccines in routine immunization
- To assess proportion of home-based vaccination card retention and assess the reasons for an absent home-based vaccination record among the mother/caretakers of children aged 12- 35 months who did not have a home-based record available at the time of survey

Methodology:

Survey methodology will follow the latest guide: World Health Organization Vaccination Coverage Cluster Surveys: Reference Manual 2018.

Mothers/caretakers of eligible children will be respondents of the survey. All children aged 12 months to 35 months at the time of survey will be eligible for survey. This survey will assess coverage for all antigen given during first year life (BCG, pentavalent, OPV, fIPV, PCV, Rota, MR1) and coverage for all antigen given during second year of life (JE, MR2, TCV).

SN	Objective	Target agegroup
1	estimate coverage among 12-23 months at the time of survey for all antigen given in first year of life	12 to 23 months at the time of survey
2	estimate coverage in 24-35 months at the time of survey for all antigen given in second year of life	24-35 months at the time of survey

Survey modality:

WHO in coordination with Family Welfare Division, Department of Health Services, will implement the survey through a hired expert research/survey agency. Selection of survey agency will be through competitive bidding and will follow WHO procurement process. Selected agency will be responsible for recruitment of enumerator, training and field deployment (enumeration, sampling of households in selected clusters and interviewing), data collection/compilation, data cleaning, analysis and report writing.

Computer-assisted personal interviewing (CAPI method) will be used for survey data collection. WHO-IPD will oversee survey to ensure adherence to standard protocol.

Selected agency will obtain NHRC approval for conducting survey.

Survey teams will verify cluster boundaries and visit all households in each of the randomly selected clusters for household listing to perform interview in CAPI. Each field team will include two enumerators and one supervisor. The household with no one at home will require two revisits. There will be no replacement for non-response household.

Two stage probability proportional to size sampling method will be used to select clusters and households in the 13 districts stratum. Agency will use wards as sampling frame for first stage sampling (i.e., clusters). Larger EAs with 400-500 households (HH) will require segmentation into smaller segments of size 200 HHs and random selection of one of the segments for enumeration. Similarly, EAs with less than 110 HHs will be merged with adjoining wards for enumeration. Households within the selected clusters will be second stage sampling. All eligible children will be enrolled in the survey (there will be fewer 1-year or 2-year cohort). Field team may need to visit 110 households to find, in average, 9 eligible children of 12-23 months children and also for 9 eligible children of 24-35 months.

In this survey design, 1020 responses would be required for combined district level estimate with desired precision. For obtaining individual district level estimate, enumerators may need to interview 1 in 6 children to 1 in 3 children from total 12-23 months cohort (1-year) or 24-35 months cohort (2-year) cohort of entire district to obtain 1020 responses. Some mountain districts even have fewer number of children in the target cohort than required number of responses for district level estimates. Adjusting the survey parameters, to acceptable uncertainty limit, the required number of responses was still high for current district demographic structure in majority of districts (600 to 800 responses required – will be equivalent to Census). Hence, survey will be conducted, taking 13 districts as single stratum, to assess routine immunization among 1-year and 2-year at the time of survey. Each of the 13 districts will not be assessed as individual stratum as this will mean assessing 13,260 number of children (enumerating greater than 800,000 HH) in 1469 number of randomly selected clusters spread over 13 districts which is not feasible or realistic approach.

Sample Size:

NDHS 2022 Report shows lowest coverage is 71% for second dose rotavirus vaccine. Thus, for calculating sample size, estimate of expected coverage at 50-70 percent for 12-23 years age group is considered. The following table provides details of sample size calculation for single year cohort 12 months to 23 months cohort.

Table 1: Sample size

Number of strata = 1	Coverage estimates for seven provinces
Expected coverage 50-70%	Number of respondents required to estimate coverage for a simple random sample to be done. This number is
Desired precision = 5%	

Effective sample size = 401 Average number of respondents per cluster = 9	derived with assumption that expected coverage of 50%-70% and with desired precision of 5%. (WHO manual, 2018)
Design effect = 2.543	To inflate the number respondent to achieve same level precision as in case simple random sampling, taking 11 as target number of respondents, Intra-cluster correlation coefficient to 0.167 and adjusting the variation occurred due to survey weight as 0.3. Readjusted to 2.04 based to match with RI design based on similar national level survey.
Average number of households to find an eligible child = 12	Three parameters, crude birth rate, infant mortality rate and household size are taken from NDHS 2016 (3.75 years cohort)
Non- response rate = 1.02	Earlier household survey shows very few non- response rates, taking 2% as percentage of eligible household are likely to not respond.
Total number of completed interview = 1020	Total number of completed interview required is multiplication of three parameter - no of strata, effective sample size and design effect
Total number of HH to visit at the national level = 12488	Multiplication of non-response rate, average number to household to visit to get an eligible and total number of completed interview required
Total number of households to visit per stratum =12488	Multiplication of effective sample size, design effect and average number to household to visit to get an eligible and total number of completed interview required
Total number of clusters per stratum = 113	Total number of clusters per stratum is outcome of three parameters which are effective sample size, design effect and target number of respondents
Total number of households per cluster = 110	Total number of households per cluster is outcome of average number to household to visit to get an eligible, non-response rate and target number to respondent
Total number of clusters = 113	This is the total number of clusters per stratum and number of strata

Hence, to estimate routine immunization coverage among 12 -23 months cohort at the time of survey, taking 50%-70% as expected coverage with 5% desired precision, effective sample size came around 227 clusters. A total of 1020 completed interviews will be needed for the design to estimate coverage in 13 districts.

(This is the proposed survey method – the survey agency submitting the proposal should further enhance the methodology in line with World Health Organization Vaccination Coverage Cluster Surveys: Reference Manual, 2018 available at:

https://www.who.int/publications/i/item/WHO-IVB-18.09 . The survey agency will need to submit detail methodology and statistical calculations in the proposal.)

Timeline:

The RFP will be published by 25 March 2024, with proposal submission deadline of 10 April 2024. The survey agency evaluation and selection will be completed by third week of April 2024. After this, the entire survey activities are planned for around 2.5 months period with dissemination of the final report by mid-July 2024. First month activities will be designing instrument and protocols, obtaining necessary approvals including ethical approvals, training enumerators, and developing field plan including piloting. Second month activities will be conducting field work/implementation of the survey and monitoring of field activities. Third month activities will be analyzing data, writing report, and finalizing report for dissemination, and dissemination of the report. Field activity will need to be conducted simultaneously in all 13 districts at once to complete the field activity within the stipulated timeframe.

SN	Activities	Month 1				Month 2				Month 3	
		week 1	week 2	week 3	week 4	week 5	week 6	week 7	week 8	week 9	week 10
1	Planning meeting with FWD and WHO-IPD										
2	Finalization of protocol										
3	Development of study instruments/ research tools										
4	Preparation, submission and obtain NHRC approval										
5	Digitalization of the tools for tablets										
6	Pretest the instrument/research tool										
7	Training of field enumerators										
8	Field deployment (implementation of survey)										
9	Monitoring of 10 to 15% clusters (FWD and IPD)										
10	Data analysis										
11	Sharing of data analysis and report writing										
12	Dissemination of the report										
13	Progress briefing (weekly)										

Expected output:

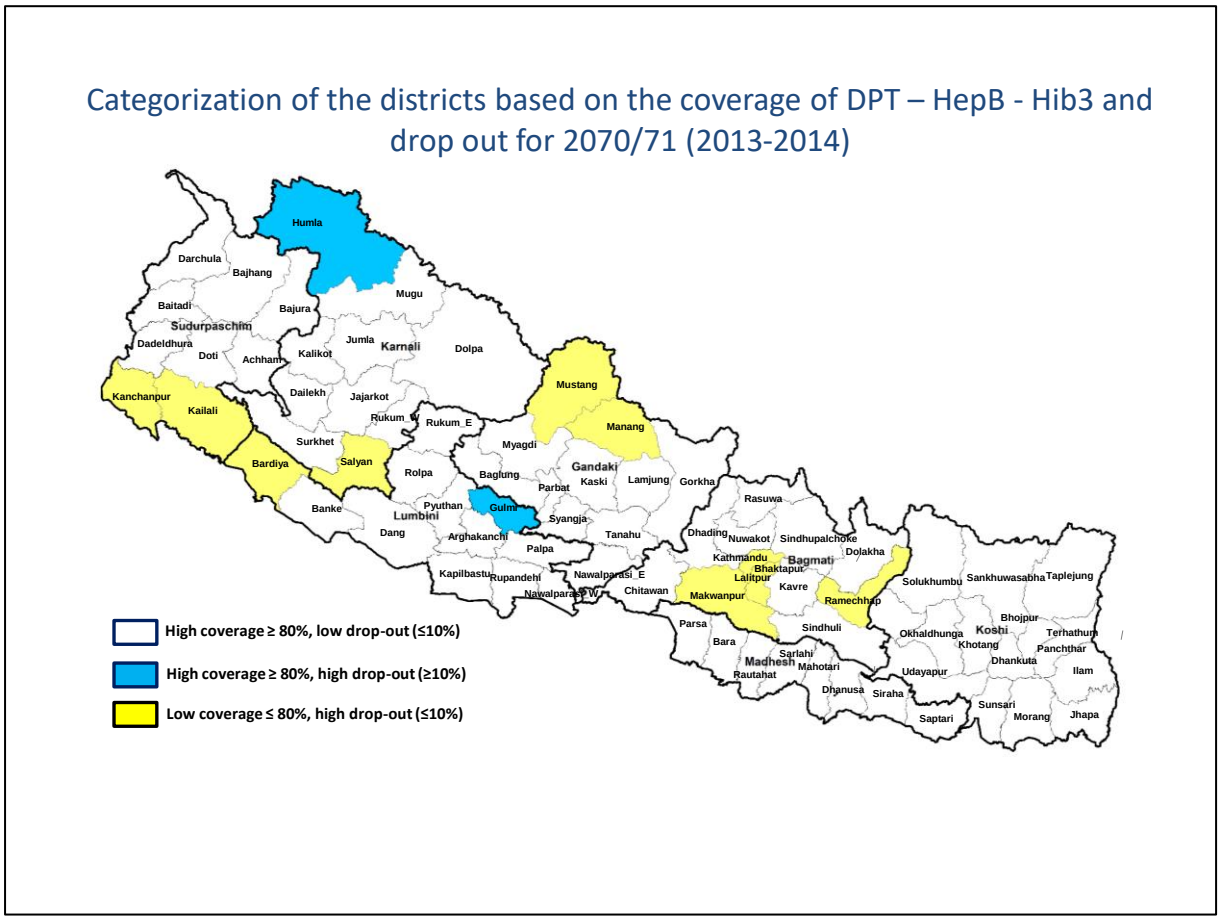
This survey will primarily assess the proportion of children in 12-23 months reached and 24-35 months reached by routine immunization. Similarly, the survey will assess card retention rate and identify factors related to vaccination uptake in these districts.

Survey findings will provide evidence on status regarding disbursement linked indicator on equity in immunization, “reduced equity gap in 13 low performing districts” and to identify barriers in seeking immunization services in these districts, including determinants. The findings will guide formulating strategies and intervention to address the barriers and reach the unreached with equity.

Annex 1: Immunization related DLIs by National Health Sector Strategy

Disbursement Linked Indicator						
	Measure/ Indicator	Year 1 Baseline	Year 2	Year 3	Year 4	Year 5
DLI 1 **Effective Operational Logistics and Supply chain management System**	EVM Score improved over 2014 baseline	The average EVM score is 64% with two attributes achieving 80%	EVM score 70% with at least 4 attributes achieving 80%		EVM score 80% with at least 6 attributes achieving 80%	
DLI 2 **Improved equity access to immunization services in targeted districts**	Reduced equity gap in poor performing districts	Poor performing districts (based on DTP coverage & dropout)		60% of low performing districts have fully immunized VDCs		100% of low performing districts have fully immunized VDCs

Annex 2: Categorization of districts based on coverage and drop-out for FY 2070/71 (Jul 2013- Jul 2014)



Annex 3: Population structure of 13 districts related to NHSS DLI

SN	District	Municipality	Ward	Number of households	0-11Month	12-23Month	24-35 Month	Total Population
1	Gulmi	12	93	66,100	3527	3917	3871	245,874
2	Ramechhap	8	64	46,466	2001	2024	2245	169,035
3	Salyan	10	83	54,672	4413	4218	4750	237,387
4	Makwanpur	10	102	105,620	6573	6989	7705	458,494
5	Humla	7	44	11,204	1094	960	1253	53,884
6	Manang	4	28	1,547	50	45	61	4,938
7	Mustang	5	25	3,606	137	131	153	11,326
8	Kailali	13	126	195,872	13111	13168	14365	899,558
9	Kanchanpur	18	167	217,452	8144	8077	8494	968,638
10	Bardiya	8	75	106,285	6775	7392	7775	457,612
11	Bhaktapur	4	38	108,406	4818	5696	5700	427,060
12	Kathmandu	11	138	542,892	17679	23327	24274	1,994,555
13	Lalitpur	6	71	140,130	5236	6005	6243	543,311
13 districts total		116	1054	1,600,252	73,558	81,949	86,889	6,471,672

Source: Census 2021

Annex 4: Routine immunization schedule of Nepal, National Immunization Program