Suggested Analyses – vaccination coverage survey

Refer to **Chapter 6** of the working draft "WHO Vaccination Coverage Cluster Survey: Reference Manual, 2015" for further guidance.

Sampling results

- N households visited
- N households with eligible children (12-59 months, residents-see definition)
- N households consented
- N households with complete interviews

Get this info by cluster and then district

Description of the sample

It can be done weighted or unweighted. If the goal is to describe the sample, and not attribute these characteristics to the population, use unweighted.

- **Cuadro 4.1.** Characteristics of the sample of children aged 12-59 months by district, Country, 2015
    - May consider table by governorate (weighted)

- Distribution of respondents by type (% mothers, fathers, others)
- Distribution of respondents by nationality or other variable of interest (e.g. indigenous/non-indigenous)
- Number of health facilities visited by district
- Frequencies of all answers (by categories of question, e.g., perceptions, knowledge, etc), or mean (ranges and other measures of distribution) for continues variables
    - Consider different stratifications

Vaccination Card Availability

- **Cuadro 5.1.** Card ever received, available and seen for children aged 12-59 months by district, Country, 2015. For home-based cards.
- Card ever received, available and seen for children aged 12-59 months by age group (12-23m, 24-35m, 36-47m, 48-59m), Country, 2015. For home-based cards.
- Cards identified in health facilities for children aged 12-59 months by district, Country, 2015.
- Dates of vaccination available by vaccine/dose for children aged 12-59 months by district, Country, 2015.
    - Consider stratifying by age group or public/private.
- Quantification of variety of vaccination cards.

Validity of Parental Recall

- Comparison of vaccination status by card vs. by recall, for children aged 12-59 months with documented vaccination by vaccine/dose by district, Country, 2015.

- o Validity of recall by vaccine: concordance, sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV).
- o Consider stratifying by age group.

Vaccination Coverage

Calculate coverage "general" (at any age before survey) and by "12 months of age" for vaccines recommended for children <12 months. The latter allows better comparison with reported administrative coverage data. Include Standard Errors and 95% CIs in the tables and graphs, and/or as annexes.

Use weights for probability of selection within household and weights for estimates at aggregated levels (governorate and national levels). Use survey function in statistical software.

Define graphs and maps.

- Percentage of children with zero doses (never vaccinated) and, if few of them, summary of their characteristics (example: all in poor urban areas, x out of x from non-national mothers, etc)

- **Cuadro 5.2.** Vaccination coverage by vaccine (and defining a "polio" that is either OPV or IPV) and complete basic schedule (refer to definition) by card and by card plus recall for children aged 12-59 months, by district, governorate and country (weighted), Country, 2015
  - o Define a "polio vaccine" that refers to either OPV or IPV
- Vaccination coverage by vaccine and complete basic schedule (refer to definition) by card plus different assumptions about recall for children aged 12-59 months, by district, governorate and country (weighted), Country, 2015
- Vaccination coverage by vaccine and complete basic schedule (refer to definition) by card and by card plus recall, by age group, Country, 2015
  - o May also do by age group AND district, governorate (weighted)], Country, 2015

- **Cuadro 5.3.** Vaccination coverage by vaccine and complete basic schedule (refer to definition) by card and by card plus recall for children aged 12-59 months, by sociodemographic or other characteristics of interest (weighted), Country, 2015
  - o *Pick characteristics of main interest*

- *Consider coverage of vaccines beyond MMR1*

- **Cuadro 5.8.** Dropout rates DTP1 to DTP3 [DTP1-DTP3/DTP1 in %), children aged 12-59 months with documented vaccination, by district, governorate and country (weighted), Country, 2015
- Dropout rates DTP1 to measles-containing vaccine 1 (MCV1), for children aged 12-59 months with documented vaccination, by district, governorate and country (weighted), Country, 2015
- Dropout rates MCV1 to measles-containing vaccine 2 (MCV2), for children aged 12-59 months with documented vaccination, by district, governorate and country (weighted), Country, 2015.
  - o Consider only including children 18-59 months or 23-59 months, as MMR1 (equivalent to MCV2) is recommended at 12 months.

- *Consider other dropouts such as polio and MCV2-MCV3*

- Vaccine info or attitudes (depending on questionnaire) for caregivers of children aged 12-59 months by district, governorate and country (weighted), Country, 2015.

- Perception of child having received all vaccines needed by age 12 months (revise in questionnaire) vs. documented child vaccination with all vaccines recommended by age 12 months, children aged 12-59 months with documented vaccination, by district, governorate and country (weighted), Country, 2015.
    - Validity of caregiver perception of having received all infant vaccines: concordance, sensitivity, specificity, PPV, NPV.
    - Consider stratifications by age-group, nationality, public/private sector
- **Cuadro 5.10.** Reasons for no vaccination DTP3 (or a combination of reasons for multiple vaccines, depending on how the question is asked)

- Hepatitis B birth dose (given the same date of birth or the day after), for children aged 12-59 months with documented vaccination, by district, governorate and country (weighted), Country, 2015.
    - Consider stratifying by age-group and/or private/public sectors

- *Consider timely vaccination by vaccine. See definitions (valid, timely, by 12 months, late, very late)*
    - *Median and IQRs (may include graphs)*
    - *Inverse Kaplan-Meier survival curves*

Associations
- Outcomes (by card+recall, and then only by card)
    - Complete basic schedule (see definition)
    - DTP3
    - MCV1
    - Other options:
        - Other vaccines
        - Timely DTP3
        - Timely MCV1
        - Timely MMR1

- Explanatory variables (list under each category after critically reviewing questionnaire)
    - Geographical (eg. Governorate, north, south, etc, some grouping that makes sense)
    - Socio-demographic
    - Household characteristics
    - Perceptions (risk, vaccine, health system)/awareness/knowledge (schedule, number of doses by 12 months)/attitudes
    - Communication (info for routine immunization)
    - Child-related (eg. Sex, country of birth, birth order)
    - Caregiver

- Present ORs plus 95%CI and/or p values (see El Salvador paper, others)

Missed Opportunities, Child-Based Analyses

The child-based (CB) analysis consists of two calculations:

1. Proportion of children who had at least *one missed-opportunities (MOV) for a given vaccine* (CB1), and
   a. Uncorrected MOV: proportion of children who *never* received the particular vaccine
   b. Corrected MOV: proportion of children who *did receive* the particular vaccine *by the time of the survey*
2. Proportion of children with at least *one MOV across all vaccines* (CB2).
   a. Proportion of children where *none* of the MOVs for the child were corrected by the time of the survey.
   b. Proportion of children where *some* of the MOVs for the child were corrected by the time of the survey.
   c. Proportion of children where *all* of the MOVs for the child were corrected by the time of the survey.

(CB1) Proportion of children who had at least one missed opportunity <u>for a given vaccine</u> (eg. DTP3):

- <u>Numerator</u>: Number of children with at least one vaccination date recorded, who were eligible to receive the considered dose but did not receive the considered dose
- <u>Denominator</u>: Number of children with at least one vaccination date recorded, who were eligible to receive the considered dose

(CB1a) Proportion of children with uncorrected MOVs

- <u>Numerator</u>: Children in (CB1) numerator who had not received the given vaccine by the time of the survey
- <u>Denominator</u>: Same denominator as (CB1)

(CB1b) Proportion of children with corrected MOVs

- <u>Numerator</u>: Children in (CB1) numerator who had received the given vaccine at a later visit as documented by the vaccination card
- <u>Denominator</u>: Same denominator as (CB1)

(CB2) Proportion of children who had at least one missed opportunity for <u>any vaccine</u>:

- <u>Numerator</u>: Number of children with at least one vaccination date recorded who did not receive a vaccine/dose when they were eligible for it

- Denominator: Number of children with at least one vaccination date recorded who were eligible to receive at least one vaccine/dose

(CB2a) Proportion of children with <u>no</u> corrected MOVs corrected

- Numerator: Children in (CB2) numerator who had not received the vaccine(s) by the time of the survey
- Denominator: Same denominator as (CB2)

(CB2b) Proportion of children with <u>all</u> corrected MOVs corrected

- Numerator: Children in (CB2) numerator who had received the vaccine(s) at a later visit as documented on the vaccination card
- Denominator: Same denominator as (CB2)

(CB2c) Proportion of children with <u>some</u> corrected MOVs corrected

- Numerator: Children in (CB2) numerator who had received some, but not all, of the vaccine(s) at a later visit, as documented by the vaccination card
- Denominator: Same denominator as (CB2)