

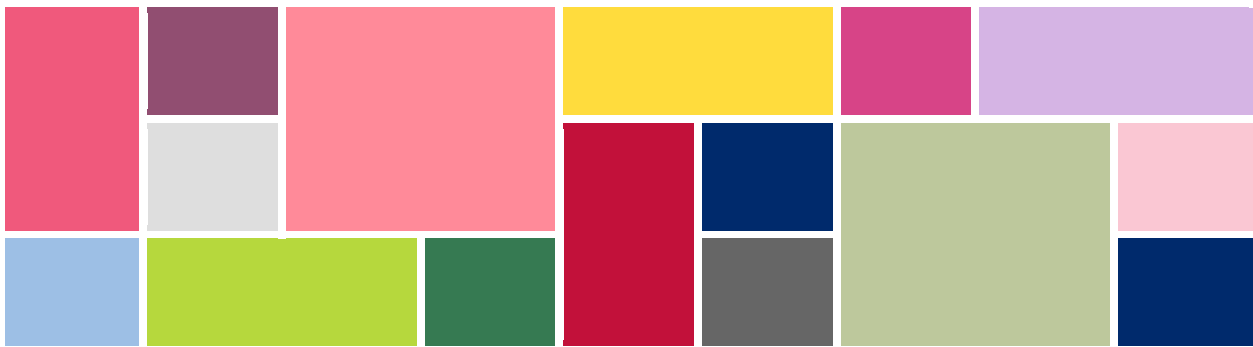


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Maternal and Child
Survival Program

Rapid Knowledge, Practices and Coverage (KPC) Survey

Immunization Module



MCSP is a global USAID initiative to introduce and support high-impact health interventions in 25 priority countries to help prevent child and maternal deaths. MCSP supports programming in maternal, newborn, and child health, immunization, family planning and reproductive health, nutrition, health systems strengthening, water/sanitation/hygiene, malaria, prevention of mother-to-child transmission of HIV, and pediatric HIV care and treatment. MCSP will tackle these issues through approaches that also focus on household and community mobilization, gender integration, and digital health, among others.

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I. Overview

This module yields information on routine childhood immunization coverage. The module includes indicator definitions, a summary of updates made to the module, notes for program managers, interviewer instructions, the tabulation plan, suggestions for other data sources, and the survey questionnaire.

The knowledge, practices, and coverage (KPC) methodology is based on the World Health Organization (WHO)'s Expanded Programme on Immunization (EPI) cluster survey methodology, which has provided guidance for measuring immunization coverage since the early 1990s. In 2015, WHO issued updated guidance for vaccination coverage surveys.¹ The updated WHO guidance moves away from the previous 30 x 7 EPI cluster survey and includes various changes, which differ from standard KPC methodology. It:

- Determines the sample size to address specific goals or objectives of the survey, which may include looking at a specific subnational area or certain level of the health system. This may require a different number of clusters than the previously standardized 30 clusters.
- Uses probability sampling, in which all eligible respondents have an equal chance of selection. This requires advance selection of households in each cluster by a central group (e.g., survey manager), rather than having the field team select households. Field teams will be required to revisit selected households until information is collected.
- Removes the residency requirement and includes all people who slept in the household the previous night to capture data on more mobile populations.
- Includes every eligible child in the household.
- Collects data from health facility registers for children whose caregivers are not in possession of their immunization card or other home-based health record.
- Puts forward more rigorous guidance for documentation of survey efforts, including recording results of each attempted visit at each household and taking photographs of vaccination cards and health facility registers.
- Performs analyses using individual cluster weights and two-sided t-tests.

WHO's updated guidance puts forward a more time- and resource-intensive methodology than the KPC. The KPC uses a relatively rapid, low-cost method of sampling that can provide information quickly for decision-making. Collecting immunization data via the KPC is therefore an important complement to more time-consuming and expensive methods of collecting immunization coverage data. KPC immunization data should be reviewed together with Demographic and Health Survey (DHS) and WHO immunization data to get the full context of immunization coverage in the project intervention areas.

2. Indicators

The following indicators can be calculated using the Routine Childhood Immunization KPC questionnaire included with this module. For this module, all seven indicators listed are key indicators that should be collected by all programs that work in immunization. Details are described in Table 1 below.

The indicator table contains indicator names and definitions, and a column that indicates whether an indicator is a key (K) or LiST (L) indicator. Numerators and denominators are not included in the tables in this section, but they can be found in the [tabulation plan](#). Lives Saved Tool (LiST) indicators are those that

¹ World Health Organization (WHO). 2015. *World Health Organization Vaccination Coverage Cluster Surveys: Reference Manual*. Version 3. Working Draft. Geneva: WHO.

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can be put into the LiST. If the indicator modeled in LiST is similar but somehow different from the KPC indicator, the LiST indicator's definition is noted as a footnote.

Key Indicators for Routine Childhood Immunization

Indicator 1.1: Availability of vaccination card or home-based record at time of survey

Indicator 1.2: Access to immunization services (Penta 1)

Indicator 1.3: Health systems performance regarding immunization services (Penta 3)

Indicator 1.4: Measles vaccination coverage (one dose)

Indicator 1.5: Dropout rate (Penta 1 to Penta 3)

Indicator 1.6: Fully immunized child, 12–23 months

Indicator 1.7: Unimmunized child

Indicator 1.8: Ever possessed a vaccination card or home-based record

Table 1. Routine Childhood Immunization Indicators

Indicator	Definition	Key or LiST
1.1 Availability of vaccination card or home-based record at time of survey	Percentage of children age 12–23 months who have a vaccination card or home-based record at the time of the survey	K
1.2 Access to immunization services (Penta 1)	Percentage of children age 12–23 months who received Penta 1 according to the vaccination card, home-based record, or mother's recall at the time of the survey	K
1.3 Health systems performance regarding immunization services (Penta 3)	Percentage of children age 12–23 months who received a Penta 3 vaccine according to the vaccination card, home-based record, or mother's recall at the time of the survey	K, L
1.4 Measles vaccination coverage (one dose)	Percentage of children age 12–23 months who received measles vaccine according to the vaccination card, home-based record, or mother's recall at the time of the survey	K, L
1.5 Dropout rate (Penta 1 to Penta 3)	Percentage of children age 12–23 months who received a card verifying that they received the Penta 1 vaccine but did not receive a card verifying they received Penta 3 vaccine at the time of the survey	K
1.6 Fully immunized children, 12–23 months	Percentage of youngest children age 12–23 months who received age appropriate vaccination at time of survey*	K
1.7 Unimmunized children	Percentage of children age 12–23 months who had not received any dose of any vaccines in the national immunization schedule by the time of the survey	K
1.8 Ever possessed a vaccination card or home-based record	Percentage of children age 12–23 months who were ever given a vaccination card or home-based record where their vaccinations are recorded	K

* With the exception of the birth dose of the oral polio vaccine and hepatitis B. Birth doses of these vaccines are excluded from the calculation of fully immunized children. This indicator is calculated from either the vaccination card verification, home-based record, or the mother's recall. WHO has an online database that presents profiles of immunization for each country, including the country's current vaccination schedule. (http://apps.who.int/immunization_monitoring/globalsummary). This information is only updated once per year. However, vaccination schedules may change at any time over the course of a year.

3. Updates to the Module

This module was revised in 2017 to reflect recent developments in immunization, including WHO’s updated approaches collecting immunization data and how the KPC can complement that new approach. Other changes include:

- The survey questionnaire has been updated.
 - The birth dose of oral polio vaccine (OPV0) was added to the valid coverage criteria chart.
 - Question **IM101** was updated to guide the interviewer in asking to see all written documentation of a child’s vaccination, in cases where caregivers may have more than one child health or vaccination card or other home-based record of vaccination history.
 - Question **IM106H** was updated to better clarify for caregivers that the pneumococcal vaccine is “another vaccine given in the thigh, usually at the same time as pentavalent vaccine.”
 - Questions **IM106I** was updated to specify the rotavirus vaccine as “a vaccine squeezed directly into the child’s mouth” to better distinguish the rotavirus vaccine from oral polio vaccine and vitamin A, which are dripped into the child’s mouth.
- The indicator “fully immunized child 0–11 months” was removed from the tabulation plan.
- The Notes for Program Managers section has been expanded to include:
 - Several points that must be determined through consultation with the national immunization program
 - A clarifying emphasis that this module, unlike other KPC modules, should collect data on ALL eligible children 12–23 months in the household
 - A section on sampling considerations in contexts with relatively high vaccination coverage
 - An expanded discussion about the importance of collecting card-verified immunization data and vaccination data from mothers’ recall
- The Interviewer Notes section has been updated to better specify that immunization information should be collected about children 12–23 months only and to note the tailoring of questionnaire for use in countries—particularly in Latin America and the Caribbean—that give the measles vaccine at 12 months.
- The survey questionnaire has been programmed into a mobile-friendly module in addition to the Microsoft Excel version, which is intended to minimize mobile programming errors made through independent user adaptations and make mobile collection easier.

4. Notes for Program Managers

This section outlines items that program managers/survey leaders need to prepare in advance before they implement the KPC and train a data collection team.

Note: In every KPC survey of routine childhood immunization, the status of **all** children 12–23 months of age in the survey area must be ascertained, regardless of whether they possess a vaccination card or other home-based record of vaccination history.

Sampling Considerations

In contexts in which “baseline” immunization coverage is high, a larger sample size may be needed to significantly measure small changes in coverage (e.g., from 85 to 90 percent). As immunization coverage approaches 100 percent, small confidence intervals are necessary to precisely measure change. Consult with a statistician to determine the sample size needed to answer the specific questions of interest or goal of the survey.

There are two options for calculating the appropriate sample size to precisely measure this small change:

1. Control the relative standard error.
 - N = the sample size
 - $Deff$ = the design effect
 - P = the estimated proportion (coverage)
 - cv = the desired relative standard error

For example, if we anticipate that the coverage is 90 percent and we want to estimate the coverage with a $cv = 0.05$, then we need:

$$N = 2 \times [(1/0.9-1) / 0.0025] = 2 \times (1.11/0.0025) = 88 \text{ kids 12–23 months}$$

2. Increase the accuracy of the comparison from baseline to endline. For sample sizes for comparison of two phases of groups, use the following formula for simple random sampling:

$$n_1 = n_2 = \frac{\left(Z_{1-\alpha/2} \sqrt{(p_1 + p_2)(q_1 + q_2)/2} + Z_{1-\beta} \sqrt{p_1 q_1 + p_2 q_2} \right)^2}{(p_1 - p_2)^2}$$

- n_1 = baseline sample size
- n_2 = endline sample size
- $Z_{1-\alpha/2}$ = Z value for chosen level of risk
- $Z_{1-\beta}$ = Z value for chosen level power (as related to “power” of test)
- p_1 = expected coverage at baseline
- $q_1 = 1 - p_1$
- p_2 = expected coverage at endline
- $q_2 = 1 - p_2$

For example, to calculate a sample to determine whether this is a significant change from 80 percent coverage to 90 percent coverage:

$$n_1 = n_2 = 200$$

For 30-cluster sampling, sample size collecting from the preceding formula will be multiple by the design effect (deff) of 2:

$$N_C = N \times \text{deff} = 2 \times 200$$

Thus $N_C = 400$

When interviewing 400 children age 12–23 months, the program should be able to precisely estimate coverage but also will be equipped with an adequate power to detect a 10 percent change compared to the baseline survey.

If the immunization is one of multiple KPC modules being implemented, use parallel sampling to capture the appropriate sample size of children age 12–23 months.

Context Considerations

While immunization has long been a standard, core component of primary health care, it is a constantly evolving area. There are important differences across countries with regard to vaccines included in the national immunization program, vaccination schedules, service delivery strategies, and recordkeeping procedures. These factors make it difficult to provide general guidance on the collection, analysis, and interpretation of immunization KPC survey data.

To appropriately adapt the Routine Childhood Immunization KPC Module for a program, it is essential that the program management team meet with national- and local-level immunization officials to determine:

1. The vaccines included in the national immunization schedule and the vaccination schedule:² There is no single vaccination schedule that is used in all countries. With major support from Gavi, many countries are in the process of introducing new vaccines. This has contributed to diversity of vaccination schedules and the lack of a single generic schedule that is uniformly used across countries. Within countries, the date of new vaccine introduction may differ by geographic or administrative area. With respect to the geographic area to be surveyed, survey managers need to learn:
 - The vaccines that are given and the names by which they are commonly called by caregivers
 - The number of doses recommended for each vaccine
 - The exact age at which they are recommended to be given: In countries where the schedule for routine immunization includes vaccinations given in the second year of life (for example, a second dose of measles vaccine), the design of the survey will need to be examined with respect to sampling, target ages to survey, and wording of questions.³
 - The minimum valid interval between vaccine doses for each vaccine that requires more than one dose
 - The anatomical sites for administration of each vaccine
 - In instances where a new vaccine(s) has been introduced during the 12–23 months prior to the KPC survey, the previous vaccination schedule (including names for vaccines, number of doses and recommended ages, and anatomical sites) that had been in use prior to the current schedule

² WHO has an online database that presents profiles of immunization for each country, including the country's current vaccination schedule (http://apps.who.int/immunization_monitoring/globalsummary). This information is only updated once per year. However, vaccinations schedules may change at any time over the course of a year.

³ If vaccines scheduled to be given in the second year of life are included in the survey, consider expanding the sampling frame to include children up to age 35 months in accordance with updated guidance from WHO.

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2. The home-based record in which administered routine vaccine doses are written:
 - Whether it is a vaccination card, a child health booklet, or another type of written record (for the purposes of this KPC, this will refer to this record as a vaccination card)
 - If more than one home-based record for routine immunization is in use in the country and in the district where the survey is to be conducted: In some contexts, some children may have more than one vaccination card. Interviewers should ask to see all written documentation of a child's vaccinations. In cases where there are multiple written documents, information should be recorded from all to get the most complete vaccination history.
 - What health workers and caregivers commonly call the home-based record
 - When the home-based record was last revised relative to the introduction of new vaccines
 - What actions health workers take to record vaccine doses if they run out of vaccination cards or booklets: For example, do they write down the doses given on a scrap of paper that they give to the mother?
 - If a personalized vaccine record for each child is maintained at the facility only and not maintained at home: Cards held at health facilities should not be considered home-based records. In such a case, program managers need to use a different survey methodology to ascertain vaccination coverage.
3. Recent mass vaccination campaigns:
 - The dates when mass campaigns were conducted in the previous 24 months in the area to be surveyed
 - The names of the campaigns where vaccinations are done: for example, national immunization days (NIDs), supplemental immunization activities (SIAs), child health days, maternal child health weeks, and what caregivers in the area to be surveyed commonly call these campaigns
 - Which vaccines were administered during each of the campaigns in the areas to be surveyed
 - The intention of the doses administered during the campaigns:
 - Supplemental doses, as is typical of polio NIDs and measles SIAs: These doses are not usually written on the child's routine vaccination or health card and **should not be included in estimates of routine immunization coverage**.
 - Routine doses, as are often provided during child health days or immunization weeks: This type of campaign is usually intended to rapidly bring children up to date on routine vaccinations for which they are overdue. Such doses are supposed to be written on the child's routine vaccination or health card and **should be included in estimates of routine immunization coverage**.
 - A combination of the two: Sometimes, mass vaccination campaigns provide both supplemental doses (e.g., for measles or polio) and routine doses for other vaccines.

Vaccination Schedule

Important points to note on variations of the vaccine schedule include:

- WHO recommends that all countries include a birth dose of hepatitis B vaccine. This has been part of the vaccination schedule of many Asian countries for years but is being introduced increasingly in other regions. The hepatitis B birth dose uses a monovalent vaccine that contains only hepatitis B vaccine. As of 2017, WHO recommends that all infants receive the birth dose within 24 hours of birth. If that is not possible, then they should receive it during the first contact with health care providers at any time up to the time of the next dose of the primary schedule. However, the exact schedule for the birth dose should be determined in accordance with the national vaccination schedule.

- Countries that are endemic for polio or are at high risk of importation of poliovirus include a birth dose of OPV in the vaccination schedule. This must be given within the first 2 weeks of life to be considered valid. In 2014, WHO recommended that all countries using OPV also provide an additional dose of polio vaccine in the form of the inactivated polio vaccine. Many countries have introduced the inactivated polio vaccine into their schedules, but the exact timing and dose have been variable across countries due to global shortages of the vaccine.
- Almost all countries have replaced DTP vaccine, which contains antigens for diphtheria, pertussis (whooping cough), and tetanus with pentavalent vaccine, which contains those three antigens as well as ones for hepatitis B and *Haemophilus Influenzae* type B.⁴ Most countries use the phrase “pentavalent vaccine” and refer to the doses given as Penta 1, Penta 2, and Penta 3. However, other countries may continue to refer to the vaccine as DTP or DTP-containing vaccine, and the immunization card may show the doses as DTP1, DTP2, and DTP3. Ask immunization officials for clarification and adapt the questionnaire accordingly.
- Many countries have introduced the pneumococcal conjugate vaccine (PCV) into their routine immunization schedule. This vaccine, which prevents forms of pneumonia and meningitis caused by *Streptococcus pneumoniae*, is given as three injections in the thigh, usually at the same time as the pentavalent vaccine (which is given in the other thigh). Countries may use different names to refer to it.
- Many countries are introducing the rotavirus vaccine as part of their immunization program. The vaccine prevents deaths from severe diarrhea caused by rotavirus. It is given orally, squeezed into the infant’s mouth, at the same time as other vaccines (OPV, pentavalent, and PCV), with the number of doses depending on the particular manufacturer of the vaccine: Rotarix® requires two doses, while Rotateq® requires three doses.
- Most countries use a measles vaccine that also contains a rubella vaccine (MR vaccine) or rubella and mumps vaccines (MMR vaccine). In addition, many countries are adding a second dose of measles-containing vaccine to their routine immunization schedule. Ask immunization officials for clarification and adapt the questionnaire accordingly.
- Some countries include regionally important vaccines in their routine immunization schedule; for example, yellow fever in parts of Africa or Japanese encephalitis in parts of Asia.

Training Interviewers

Interviewers should be trained to use the local terminology for each vaccine. They should also be trained on how to review and transcribe information from the vaccination card or home-based record. For example, they should be able to distinguish between a date for a vaccination appointment and a date on which the vaccine was actually given. Interviewers should also know the national vaccination schedule and be familiar with administration methods of vaccines (which ones are given orally and which by injection) and with injection sites. This information is helpful when no vaccination card or home-based record is available and interviewers are determining vaccination status by a mother’s recall.

Choosing Indicators

The indicators presented in this module are outcome indicators to assess the success of vaccination programs in reaching children. The indicators listed are considered key indicators and are recommended for inclusion in all surveys if the project has a routine childhood immunization component.

It is important to include the indicator for whether the mother is in possession of the child immunization card. If the mother does have the card, it is important to record data directly from the card first and then ask the mother about the vaccinations her child received. Collecting both card-verified data and data from mother’s recall is important.

⁴ As of 2016, India and Indonesia have not introduced pentavalent vaccine on a nationwide basis.

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Because not all mothers may have immunization cards or other home-based records of their child's vaccination, the mother's recall is still useful. However, there are limitations to mothers' recall. Recall accuracy varies by disease and intervention; mothers' recall of their child's diarrheal episodes may be accurate within only a 2- to 3-day period,⁵ whereas recall of mass administration of drugs may be accurate for up to 1 year.⁶ Because of the increased numbers of vaccines given in current vaccination schedules, mothers' recall is highly likely to be less reliable than previously.

All indicators measuring card verified data must be reported along with confirmation that the vaccination card or home-based record was available (indicator 1.1) and in the mother's possession.

When selecting other (nonkey) indicators, it is important to consider both the long-term and the short-term objectives and how each will be measured. "Benchmark" or process indicators, which measure progress made toward achieving greater outcomes, are key to ensuring programs and initiatives are on track to reaching long-term goals. If the survey manager decides to collect additional information related to these process indicators—for example, how many times the mother received a home visit or short message service message to remind her to take her child for vaccination—then additional questions would need to be added.

For example, if the grant activities include providing reminder visits or reminder text messages to mothers to bring the child for vaccination, then the corresponding indicator would be percentage of mothers of children age 12–23 months who received at least one reminder message to bring their child for vaccination.

If the grant activities include integrated immunization/family planning service delivery, then a possible indicator would be percentage of mothers of children age 12–23 months who report that they were reminded by the vaccinator to seek family planning services at the same facility the same day as their child's immunization.

Questionnaire Overview

The routine childhood immunization questionnaire has two sections: one in which interviewers review the child's vaccination card and record, and one in which the interviewers ask the caregiver which vaccines the child has received. An additional table is included to assist in determining validity of doses and valid doses received by 12 months.

Determining Valid Coverage

Valid doses are those that are given no earlier than the recommended age and at the correct minimum interval between doses for those vaccines that require multiple doses. This information can only be derived from dates recorded on vaccination cards. By contrast, "crude coverage" is based on information from vaccination cards, home-based records, and/or mothers' recall. Coverage estimates based on valid doses are therefore lower than those based on crude doses.

If using the valid coverage chart, it is very important to ensure that staff are calculating age at vaccination and dose intervals correctly. Interviewers do not need to fill out the chart while in the field; this task may be done later. Program managers should decide who will fill out the charts (interviewers, supervisors, or other staff) and conduct quality checks to reduce errors.

⁵ Boerma JT, Black RE, Sommerfelt AE, Rutstein SO, Bicego GT. 1991. Accuracy and completeness of mothers' recall of diarrhoea occurrence in pre-school children in demographic and health surveys. *Int J Epidemiol.* 20(4):1073–80.

⁶ Budge PJ, Sognikini E, Akosa A, Mathieu EM, Deming M. 2016. Accuracy of coverage survey recall following an integrated mass drug administration for lymphatic filariasis, schistosomiasis, and soil-transmitted helminthiasis. *PLoS Negl Trop Dis.* 10(1): e0004358. doi: 10.1371/journal.pntd.0004358.

Common Survey Question Considerations for Adaptation

Many of the indicators and corresponding questions in this module are based on international standards or current best practices, but some may need to be modified because of national policy, local context, or language. The following table contains common adjustments to consider. **The tabulation plan must be adjusted in parallel.**

Question No.	Consideration
IM101	Adapt question to use local name for vaccination card or home-based record on which the children's vaccinations are recorded.
IM103 and IM106	Adapt the list of vaccines so that they match the national immunization schedule that was in use in the geographic areas to be surveyed during the 12–23 months before the survey.
IM105	Adapt question to reflect whether the doses given during immunization campaigns should be counted as routine (and therefore included in estimates of vaccination coverage).
IM106	Adapt anatomical site of injection based on national protocols.
IM107 and IM108	If program managers prefer to use a computer statistical package to analyze valid coverage and valid doses received by 12 months, these questions (and the valid coverage chart) may be deleted.

5. Interviewer Notes

For this module, questions are asked about all children age 12–23 months in the household.

Asking Questions and Recording Answers

It is important that you ask each question exactly as it is written in the questionnaire. In addition to the questions, there are statements that appear in all capital letters, indicating that they are interviewer instructions and should not be read aloud to the mother.

Most questions in this module have precoded responses that should not be read aloud to the mother. When you ask a question, you should listen to the mother's response and then circle the code next to the category that best matches her answer or write the mother's response on the survey form, if appropriate. Sometimes it will be appropriate to circle multiple answers. Read the instructions on the questionnaire carefully for each question.

Filling in Identification Information

To calculate the indicators for this module, the child's date of birth must be recorded. Normally, this module is part of a larger KPC survey. This information is collected at the beginning of the interview, but it is important to make sure that date of birth and other crucial identification information (cluster number or supervision area, household number, and record number) are recorded as part of the survey.

Note that while the other KPC modules ask questions about children age 0–23 months, this module asks questions only about those age 12–23 months.

Important Notes about Asking Certain Questions

IM100: Check the cover sheet to see if there are any children in the household that are at least 12 months old. If yes, complete the module asking questions about all children 12–23 months in the household. If no, do not implement this module.

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IM101: Routine vaccinations are supposed to be recorded in a vaccination card, a child health card, or a home-based record. Show an example(s) of the most commonly used material to the mother. If the mother says that she has a vaccination card for (CHILD’S NAME), then ask, “May I see the card or other documents where (NAME)’s vaccinations are written down? If (NAME)’s vaccinations are written down on more than one card or paper, may I please see them all?” In some cases, the mother may not be willing to take time to look for the vaccination card, thinking that you are in a hurry. Encourage her to look for (CHILD’S NAME)’s card. It is highly desirable to obtain written documentation of the child’s immunization history; therefore, be patient if the respondent needs to search for the card. If she says that the health worker only wrote the information down on a piece of paper, then reassure her that that is all right and ask her to show it to you.

IM103: If the mother shows you a vaccination card, ask if you may copy the information from the card. If the child has more than one vaccination card, use information from both/all documents. Fill in the responses to **IM103**, taking the **information directly from the card(s)**. Before recording the information, be certain that you have the correct card for (NAME OF CHILD). When copying information from the vaccination card, be very careful. Dates on the survey form should be recorded with the day first, then the month and the year. Check the card carefully to see which way the dates are written, as sometimes the month might come first, followed by the day and year. Be very careful to record dates correctly.

All information from the vaccination card should be transcribed exactly as it is shown on the card, even if the data collector is concerned that the doses may have been given earlier or later than what is called for in the vaccination schedule. For example, if the card indicates that the birth dose of polio vaccine was given at 4 months of age (which is too late to be considered valid as a birth dose), it should still be recorded as is. Later, during the data analysis section, a determination will be made as to whether some doses cannot be considered valid because they were given at the wrong time.

In addition to recording vaccination dates on the card, some health facilities may also record the dates (appointments) on which the mother should bring her child for the next immunizations. **Be very careful not to record a scheduled appointment date as a vaccination date.** It is possible that an appointment date was given but the child never received the vaccination. Only record the dates of vaccinations actually given, not the dates of appointments. Be patient and read the card thoroughly.

If the card shows only part of the date, record “44” for DON’T KNOW in the column for which the information is not given.

Example: If the date given was July 2017, you would record “44” for DAY, “07” for MONTH, and “2017” for YEAR.

If the card shows that a vaccination was given but there is no date recorded, record “44” in the DAY column next to the vaccine and leave the month and year blank. However, if a date is given for a pentavalent vaccination and there is simply a check mark to show that a polio vaccine was also given, record the date of the pentavalent vaccination on the polio line, since this probably indicates that both vaccinations were given on the same day. If an immunization card has only a single line for Penta 1 and Polio 1, Penta 2 and Polio 2, etc., and there is a date on one of these lines, record the same date for both the pentavalent and polio vaccinations.

IM106: If you did not see a child’s vaccination card and the mother tells you that the child received at least one vaccination or the vaccination card was shown and the mother tells you that the child received vaccinations not recorded, ask the series of questions in **IM106A–K** about BCG, polio vaccine (or OPV), pentavalent vaccine, PCV, rotavirus, measles, and any other vaccines (such as yellow fever or vitamin A supplementation, even though it is not a vaccine) after adaptation of the survey form to the national vaccination schedule.

Read the introductory question—“Please tell me if (NAME OF CHILD) received any of the following vaccinations”—and then ask **IM106A–K**, following the appropriate skip patterns. There are many types of vaccines, so it is important that the mother knows to which vaccine each question refers and how and where it is given. **Read the whole sentence before accepting the mother’s response.**⁷

For each question, when the mother responds that her child has received a vaccine that has not been previously recorded on the child’s vaccination card, fill in the corresponding row with “66” in the day, month, and year columns. For example, if the mother says that the child received OPV within the first 2 weeks after birth (**IM106D**), fill in “66” in the day, month, and year columns of Polio 0 (**IM103C**). If the mother then responds that the child has received three total doses of the polio vaccine or OPV (in **IM106E**), fill in “66” in the day, month, and year columns of Polio 1 (**IM103D**) and Polio 2 (**IM103E**), leaving Polio 3 (**IM103F**) blank. Do the same for each vaccine listed in **IM106**. In the absence of the vaccination card, the dates on which vaccinations were given cannot be assumed with certainty. **Do not write estimated dates.**

Notice that there are follow-up questions for the polio, pentavalent, and other vaccinations. For example, for the OPV, you will ask if the child received it (**IM106C**), when the child first received it (**IM106D**), and how many times the child received it (**IM106E**). Similarly, for the pentavalent vaccine, you will ask if the child received the vaccination (**IM106F**) and how many times (**IM106G**). This is repeated for **IM106H** (PCV) and **IM106J** (rotavirus).

The introduction of rotavirus and PCV vaccines poses challenges to interviewers. With the addition of PCV, the child will now be receiving two injections in the thigh. In some countries, pentavalent vaccine is normally given in the left thigh and PCV in the right thigh. If the mother reports that the child received two injections (one in each thigh), it can be assumed that the child received both vaccines. If the mother reports that the child received just one injection in the thigh at a vaccination session, it will not be possible to know which vaccine was received. It may be easiest to ask the mother how many times her child received two injections in the thigh on the same day. You may come across situations where you learn that health workers are giving a particular antigen in a part of the body not recommended by national guidelines (most notoriously, pentavalent or DPT in the buttocks). If this occurs, determine which vaccine was given to the best of your ability and record the dose. Then report the incident to your supervisor or the program manager.

The introduction of rotavirus vaccine poses a similar challenge but may be easier to address. Infants will receive both OPV and rotavirus vaccine by mouth at the same immunization session. But whereas OPV is administered as two drops, the tube of rotavirus vaccine is placed in the side of the infant’s mouth, and the vaccine is squeezed into the mouth.

Valid Coverage Chart

For vaccine doses to be valid, they must be documented on the vaccination card with exact dates and follow the vaccination schedule (with the exception of BCG, which can be verified by a scar). The second tab of the questionnaire includes a chart to help determine whether or not vaccine doses are valid and if they were given by 12 months of age.

The chart should be filled out after the interview is complete, preferably at the end of the day. The supervisor may ask the interviewer to complete the chart or s/he may do it himself/herself.

First, copy the child’s date of birth from the cover page onto the chart in the space provided. This will help you more quickly determine if vaccines were given at the appropriate age. Next, record the date of each vaccination in the column labeled “Date Recorded.” If **any** of the vaccines are missing a date or have a “44” or “66” recorded, it cannot be determined if the dose is valid, and you may stop filling out the chart. You have then finished with that questionnaire.

⁷ It is important to understand how routine and catch-up campaigns are referred to in-country so the interviewer can understand if the vaccine that the mother is recalling is from the routine system (thus, counted as coverage) or from a campaign, which does not count as coverage.

Immunization Module

If all of the dates are properly recorded, then check the remaining columns and write “Y” or “N” as appropriate. Note that when a cell is grayed out, that column/criteria does/do not apply to that particular vaccine. For example, BCG only requires you to fill in the first two columns, “Date Recorded” and “Scar Present.”

For Polio 1, PCV 1, Penta 1, and Rotavirus 1, you will need to count how many days passed between the child’s date of birth and the date of the vaccine dose. If less than 42 days passed, record “N” in the respective column. Otherwise, record “Y” and continue filling out the next vaccine in the chart. For Polio 2 and 3, Penta 2 and 3, PCV 2 and 3, and Rotavirus 2 and 3, you will need to count how many days passed since the previous dose. If less than 28 days, record “N” in the respective column. For example, if Polio 2 was given on 17/01/2017 and Polio 3 was given on 13/02/2017, then only 27 days have passed, and the Polio 3 dose is not valid. Record “N” for Polio 3 in the respective column. If Polio 3 was given on 14/02/2017, then 28 days have passed, and you will record “Y” in the respective column and continue with the next vaccine in the chart.

For measles, count the months between the child’s birth date and the measles dose. If the dose was given before the child reached 9 months (270 days) of age, record “N” in the chart column. Otherwise, record “Y” and continue with the next vaccine in the chart. **Note: In some countries, the vaccine schedule specifies the first measles vaccine is given at 12 months of age.** In these countries, if the dose was given before a child was 12 months of age, record “N” in the chart column. Otherwise, record “Y” and continue with the next vaccine in the chart. In some countries, the measles vaccines may be combined with other vaccines (i.e., MR or MMR). In these countries, if either an MR or MMR dose was given before a child was 12 months of age, record “N” in the chart column. Otherwise, record “Y” and continue with the next vaccine in the chart.

For the column labeled “Dose Valid?”, check to see that all the cells in the row are labeled “Y” (except the grayed-out cells). If so, record “Y” in the column for that vaccine. In the column labeled “Given Before 12 Months?”, check to see that the date recorded for the vaccine is **before** the child’s first birthday. For example, if a child was born on 15/09/2017 and the measles dose was given on 02/10/2017, then the dose was given after 12 months, and you should record “N” in the cell.

After completing the chart, check the response you recorded in the column labeled “Dose Valid?” If they are all “Y,” then go to **IM107** and circle “1” for “Yes.” Then check the column labeled “Given Before 12 Months?” If these are all “Y” as well, then go to **IM108** and circle “1” for “Yes.” (If the answer to **IM107** is “2” for “No,” then you do not need to fill out **IM108**.)

6. Tabulation Plan

Table 2. Routine childhood immunization

Indicator	How to Calculate the Indicator
<p>I.1 Availability of vaccination card at time of survey</p> <p>Percentage of children age 12–23 months who can produce a vaccination card or home-based record at the time of the survey</p>	<p>Number of children age 12–23 months who currently have a vaccination card or home-based record</p> $\frac{\text{IMI101} = [\text{I OR 2}]}{\text{Number of children age 12–23 months in the survey}} \times 100$
<p>I.2 Access to immunization services (Penta 1)</p> <p>Percentage of children age 12–23 months who received Penta 1 according to the vaccination card, home-based record, or mother's recall by the time of the survey</p>	<p>Number of children age 12–23 who received Penta 1 at the time of the survey as verified by vaccination card, home-based record, or mother's recall</p> $\frac{(\text{IMI03GD} <> \text{""}) \text{ AND } (\text{IMI03GM} <> \text{""}) \text{ AND } (\text{IMI03GY} <> \text{""})}{\text{Number of children age 12–23 months in the survey}} \times 100$
<p>I.3 Health systems performance regarding immunization services (Penta 3)</p> <p>Percentage of children age 12–23 months who received a Penta 3 according to the vaccination card, home-based record, or mother's recall by the time of the survey</p>	<p>Number of children age 12–23 months who received Penta 3 at the time of the survey as verified by vaccination card, home-based record, or mother's recall</p> $\frac{(\text{IMI03ID} <> \text{""}) \text{ AND } (\text{IMI03IM} <> \text{""}) \text{ AND } (\text{IMI03IY} <> \text{""})}{\text{Number of children age 12–23 months in the survey}} \times 100$
<p>I.4 Measles vaccination coverage (one dose)</p> <p>Percentage of children age 12–23 months who received measles vaccine according to the vaccination card, home-based record, or mother's recall by the time of the survey</p>	<p>Number of children age 12–23 months who received measles vaccine by the time of the survey as verified by vaccination card, home-based record, or mother's recall</p> $\frac{(\text{IMI03PD} <> \text{""}) \text{ AND } (\text{IMI03PM} <> \text{""}) \text{ AND } (\text{IMI03PY} <> \text{""})}{\text{Number of children age 12–23 months in the survey}} \times 100$
<p>I.5 Dropout rate (Penta 1 to Penta 3)</p> <p>Percentage of children age 12–23 months who received a card- or home-based record-verified Penta 1 vaccine and did not receive a card- or home-based record-verified Penta 3 vaccine at the time of the survey</p>	<p>Number of children age 12–23 months who received a card- or home-based record-verified Penta 1 by the time of the survey and did NOT receive a card- or home-based record-verified Penta 3 at the time of the survey</p> $\frac{[(\text{IMI03GD} <> \text{""}) \text{ AND } (\text{IMI03GM} <> \text{""}) \text{ AND } (\text{IMI03GY} <> \text{""})] \text{ AND } [(\text{IMI03ID} = \text{""}) \text{ AND } (\text{IMI03IM} = \text{""}) \text{ AND } (\text{IMI03IY} = \text{""})]}{\text{Number of children age 12–23 months who received card- or home-based record-verified Penta 1 by the time of the survey}} \times 100$

<p>I.6 Fully immunized child, 12–23 months (card verified or mother’s recall)</p> <p>Percentage of youngest children age 12–23 months who received age-appropriate vaccination by time of survey</p>	<p>Number of children age 12–23 months who received age-appropriate vaccinations by time of survey</p> <p>[(IMI03AD <> “”) AND (IMI03AM <> “”) AND (IMI03AY <> “”) AND (IMI03FD <> “”) AND (IMI03FM <> “”) AND (IMI03FY <> “”) AND (IMI03ID <> “”) AND (IMI03IM <> “”) AND (IMI03IY <> “”) AND (IMI03LD <> “”) AND (IMI03LM <> “”) AND (IMI03LY <> “”) AND (IMI03OD <> “”) AND (IMI03OM <> “”) AND (IMI03OY <> “”) AND (IMI03PD <> “”) AND (IMI03PM <> “”) AND (IMI03PY <> “”)]</p> <p style="text-align: right;">X100</p> <hr/> <p>Number of children age 12–23 months in the survey</p>
<p>I.7 Unimmunized child</p> <p>Percentage of children age 12–23 months who did not receive any dose of any vaccine in the national vaccination schedule by the time of the survey</p>	<p>Number of children age 12–23 months who did not receive any dose of any vaccine in the national vaccination schedule by the time of the survey</p> <p>[(IMI03AD = “”) AND (IMI03AM = “”) AND (IMI03AY = “”) AND (IMI03BD = “”) AND (IMI03BM = “”) AND (IMI03BY = “”) AND (IMI03CD = “”) AND (IMI03CM = “”) AND (IMI03CY = “”) AND (IMI03DD = “”) AND (IMI03DM = “”) AND (IMI03DY = “”) (IMI03ED = “”) AND (IMI03EM = “”) AND (IMI03EY = “”) AND (IMI03FD = “”) AND (IMI03FM = “”) AND (IMI03FY = “”) AND (IMI03GD = “”) AND (IMI03GM = “”) AND (IMI03GY = “”) AND (IMI03HD = “”) AND (IMI03HM = “”) AND (IMI03HY = “”) AND (IMI03ID = “”) AND (IMI03IM = “”) AND (IMI03IY = “”) AND (IMI03JD = “”) AND (IMI03JM = “”) AND (IMI03JY = “”) AND (IMI03KD = “”) AND (IMI03KM = “”) AND (IMI03KY = “”) AND (IMI03LD = “”) AND (IMI03LM = “”) AND (IMI03LY = “”) AND (IMI03MD = “”) AND (IMI03MM = “”) AND (IMI03MY = “”) AND (IMI03ND = “”) AND (IMI03NM = “”) AND (IMI03NY = “”) AND (IMI03OD = “”) AND (IMI03OM = “”) AND (IMI03OY = “”) AND (IMI03PD = “”) AND (IMI03PM = “”) AND (IMI03PY = “”)]</p> <hr/> <p>Number of children age 12–23 months in the survey</p>
<p>I.8 Ever possessed a vaccination card or home-based record</p> <p>Percentage of children age 12–23 months who were ever given a vaccination card or a home-based record where their vaccinations are recorded</p>	<p>Number of children age 12–23 months who were ever given a vaccination card or home-based record where their vaccinations are recorded</p> <p>[(IMI01 = 1) OR (IMI01 = 2) OR (IMI02 = 1)]</p> <hr/> <p>Number of children age 12–23 months in the survey</p>

7. Other Data Sources

Qualitative

Certain topics are better explored using qualitative research techniques rather than closed-ended questions. The qualitative research component will yield important information on community knowledge, beliefs, and normative practices related to sick children. For example, findings from focus group discussions could be used to modify the KPC questionnaire to reflect local terms, concepts, and customs. In addition, upon completion of the KPC survey, there may be additional areas that need to be explored. Thus, qualitative methods can be employed to provide explanations for the phenomena that were identified but not sufficiently explained by the KPC survey results. The following list contains a sample of topics relevant to routine immunization that could be explored through qualitative research means:

- What communities understand as the purpose of vaccinations for children
- How much importance people place on childhood vaccinations and why
- Reasons why some children in the community are not vaccinated (barriers, including societal and cultural barriers to vaccinations)
- How well caregivers know when and where to take children for their next vaccinations and what strategies the vaccination program is currently using to inform them
- The community's perception of the quality of vaccination services
- Availability, accessibility, and reliability of vaccination services (days and hours that services are provided, staff presence, etc.)
- Which strategies vaccination programs are currently using to increase attendance at vaccination points (home visits, etc.)

Please note that while potential topics are provided, the KPC tools do not include guidance on how to conduct qualitative studies.

Health Facility Assessments

The KPC does not include indicators to assess quality of vaccination services or of the vaccination program. Most projects will need to measure provider performance (through methods such as record review, observation, and exit interviews) and vaccine supply and management. Critical issues include implementation of open-vial policies, checking vaccination status at every contact (to reduce missed opportunities), vaccine supply, inventory management, and maintenance of the cold chain (including equipment).

8. Survey Questionnaire

[See Excel file [Immunization_Questionnaire_9October17_Final](#).]

