Expanded Program on Immunization
Government of Pakistan

Third-Party Verification Immunization Coverage Survey (TPVICS)

Survey Report

Centre of Excellence in Women and Child Health
The Aga Khan University

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THE AGA KHAN UNIVERSITY

Message from the National Programme Manager, Federal EPI

The value of *third-party validation* is substantial, and the Expanded Programme on Immunization (EPI) strongly believes in harnessing the power of this phenomenon in terms of improving internal processes, identifying risks and opportunities, increasing the reliability of data, and building a strong reputation/credibility.

It gives me immense pleasure to share with you the findings of the latest survey i.e., **Third-Party Verification Immunization Coverage Survey (TPVICS)**, the largest survey ever on Routine Immunization in Pakistan with district-level representative data collected from across Pakistan. The initiative with a national level magnitude was envisioned by the Expanded Programme on Immunization (EPI) under the leadership of Ministry of National Health Services Regulations & Coordination (MoNHSR&C) and conducted by the Aga Khan University along with implementing partners through the National Immunization Support Project (NISP).

On behalf of the Expanded Program on Immunization (EPI), I am thankful to the leadership provided by the Ministry of National Health Services Regulations and Coordination (MoNHSR&C) in terms of supervision and oversight. I also extend special acknowledgement to all provincial and regional EPI Managers for their continuous support and commitment during the entire process. The remarkable role played by the Planning Commission, Pakistan Bureau of Statistics and other line Government Departments is highly valued.

I would also like to thank the World Bank, Gates Foundation, and partners under the National Immunization Support Project (NISP) for their financial and technical support. Additionally, the Federal EPI would like to acknowledge the contribution of the WHO, UNICEF technical staff involved in the process specially the indispensable leadership of Dr. Palitha Gunarathna Mahipala (WHO) and Ms. Aida Girma-Melaku (UNICEF).

Federal EPI also recognizes the collective efforts of TPVICS technical Sub-committee for providing continuous mentorship throughout the survey. The Federal EPI Team appreciates the efforts of Aga Khan University including the work of **Mr. Imtiaz Hussain, Dr. Atif Habib**, and field teams under the leadership of Prof. **Sajid Bashir Soofi**.

Lastly, since the initiative was the brainchild of Federal EPI, therefore this preamble is incomplete without mentioning the names of a couple of core team members behind the whole process inclusive of Dr. Rana Muhammad Safdar and Dr. Soofia Yunus.

The survey findings have been rolled out and we have been furnished with valuable information and data sets. Now it's time to reap the benefits, I am sure that in the light of the survey findings, we as a team will use our collective wisdom and improve immunization coverage in areas where the programme needs special focus in order to achieve Universal Immunization Coverage.

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Comments from the Principal Investigator

The Aga Khan University is greatly privileged to undertake this Survey under the guidance of the Federal Ministry of Health (Expanded Program on Immunization (EPI), World Bank, key supporters of National Immunization Support Program (NISP) and sub-technical committee established for this purpose. Sufficeth to say that the Third-Party Verification Immunization Coverage Survey 2020 was one of the most ambitious studies undertaken in Pakistan surveying over 110,000 households across all districts of Pakistan including Azad Jammu and Kashmir (AJK), and Gilgit-Baltistan (GB).

Funding support for TPVICS was provided by the World Bank for the implementation of the survey in four provinces and Islamabad, while GB and AJK were funded by the Bill and Melinda Gates Foundation (BMGF). AKU worked with the diligent guidance of the sub-technical committee established to support the design and implementation processes of the TPVICS. AKU also collaborated with the Pakistan Bureau of Statistics (PBS) for technical support on sample design and to obtain the sampling frame for TPVICS from the Pakistan Population Census (2017).

TPVICS aimed at independently verifying the validity of immunization coverage data reported by the provinces and districts in years 3 and 5 of the NISP, on 4 out of 10 agreed Disbursement Link Indicators (DLIs) developed by the Federal EPI. This is the first ever, district-specific survey in the Country which has provided district-powered results about coverage of routine immunization in Pakistan.

This Survey would not have been possible without the hard work and dedication of hundreds of field staff and collaborators.

As the Principal Investigator of the project, I am grateful for the support provided by the teams of Federal and Provincial EPI in obtaining permissions from the provincial and district authorities as well as their presence in the training of field staff across Pakistan.

I would also like to acknowledge the tireless efforts of sub-technical committee members in reviewing and finalization of survey design and implementation processes of the TPVICS.

The astute guidance of **Prof Zulfiqar A Bhutta** has always been there for us.

As the team lead, I am also deeply grateful to the support provided in field operations of survey by several partners in Baluchistan and Khyber Pakhtunkhawa: CONTECH International, PHC Global, Taraqee Foundation, Youth Organization and Trust for Vaccines and Immunization.

From CoE WCH's team, **Mr. Imtiaz Hussain** led the work with great aplomb and dedication, ably supported by **Dr Muhammad Atif Habib**, Provincial Managers; **Muhammad Ali Khan**, **Masawar Hussain**, **Anwer Rafey**, **Mirbaz Khan**, **Muhammad Usman** and **Khalid Khan** and regional / district supervisors. I am also grateful to the team of Grants and Research Administration of CoE WCH/IGHD, led by **Mir Asghar Ali Khan**. The Project was diligently coordinated by **Ali Hussaini, Ahmad Khan,** and **Muhammad Umer**. The support provided by the team of Research Data Management Unit **[Imran Ahmed, Arjumand Rizvi Uzair Ansari, Khalid Feroze and Shahroz Khan]** was remarkable.

I appreciate the technical support provided by Dale Rhoda, from Biostat Global Consulting for the survey.

I am deeply grateful to the leadership and support of the Aga Khan University who not only took great interest in this national task but supported it to the hilt from the University.

I shall be most pleased to receive your valuable comments on this.

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Principal Investigator of the project

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Abbreviations

AJK	Azad Jammu and Kashmir
AKU	Aga Khan University
BCG	Bacille Calmette-Guérin
BMGF	Bill and Melinda Gates Foundation
CAPI	Computer Assisted Personal Interviews
CES	Coverage Evaluation Survey
CI	Confidence Interval
CMYP	Comprehensive Multi-year Plan
DLIs	Disbursement Link Indicators
EBs	Enumeration Blocks
EPI	Expanded Programme of Immunization
ERC	Ethical Review Committee
FIC	Fully Immunization Coverage
GB	Gilgit-Baltistan
ICC	Inter-agency Coordinating Committee
GoP	Government of Pakistan
HHs	Households
IPV	Inactivated Polio Vaccine
KP	Khyber Pakhtunkhwa
KP-NMD	Khyber Pakhtunkhwa Newly Merged Districts/ Federally Administered Tribal Areas
MCV	Measles-Containing-Vaccine

MDGs	Millennium Development Goals
MoNHSRC	Ministry of National Health Services Regulation & Coordination
NBC	National Bioethics Committee
NISP	National Immunization Support Project
NOCs	No Objection Certificates
NNS	National Nutrition Survey
PBS	Pakistan Bureau of Statistics
PCV	Pneumococcal Conjugate Vaccine
PSUs	Primary Sampling Units
SDGs	Sustainable Development Goals
SOPs	Standard Operating Procedures
SSUs	Secondary Sampling Units
TAG	Technical Advisory Group
TPVICS	Third-party Verification Immunization Coverage Survey
ToR	Terms of Reference
ToT	Training of Trainers
VPD	Vaccine-preventable diseases
WB	World Bank
WHO	World Health Organization

Key Definitions

Full Immunized: Fully immunized is defined as a child who has completed their immunizations till Measles dose 1 (given at 9 months of age) as per the schedule of the Expanded Program on Immunization (EPI) except Rotavirus vaccine. Rota vaccination is not required for the child to be considered fully immunized under TPVICS.

Partially Immunized: A child who has missed any of the vaccines given under the national immunization programme till one year of age is classified as partially immunized [1].

Mother's/Father's Education Level: The parental education level is classified into four categories including None (Not attended formal schooling), Primary education (1-5 years of formal education), Middle (6-8 years of formal education), Secondary (9-10 years of formal education), Higher (formal education of 11 years and above).

Literate: Those who have attended at least one or more years of formal education.

Formal Education: Formal education means schooling of one or more years obtained from a public or a recognized private institution. It mostly consists of initial education.

Household: A household comprises either one person living alone or a group of people, who may or may not be related, living at the same address, with common housekeeping, who either share at least one meal a day or share common living accommodation (i.e. a living room or sitting room) [2].

Wealth Quintiles: Households are divided into five equal categories (poorest, poor, middle, rich, and richest), each with 20% of the population, based on the number and kinds of consumer goods they own, ranging from a television to a bicycle or car, and housing characteristics such as source of drinking water, toilet facilities, and flooring materials [3,4].

Executive Summary

Immunization programs are considered as key to avert vaccine preventable diseases in a country. The Expanded Program on Immunization (EPI) was launched in 1994 in Pakistan, since then it has been delivering extensively to reduce the burden of vaccine preventable disease in the country. To augment further Pakistan started its National Immunization Support Project (NISP) in 2016 to coordinate efforts for immunization and reducing vaccine-preventable diseases. This project liaises with development partners to help coordinate fund distribution and monitors the progress of the immunization efforts. NISP includes ten Disbursement Linked Indicators (DLIs), which are the benchmark for progress monitoring of the project and triggers disbursement from the co-financing partners (the World Bank, the United States Agency for International Development (USAID), Gavi the Vaccine Alliance and the Bill and Melinda Gates Foundation).

To get more granular information on vaccine coverage and immunization service delivery, the Third-Party Verification of Immunization Coverage Survey (TPVICS) was done to assess the progress of four out of the ten DLIs under the NISP. The survey was conducted in all four provinces i.e. Sindh, Punjab, Khyber Pakhtunkhwa (KP), Balochistan and three federal regions i.e. Islamabad, Azad Jammu and Kashmir (AJK) and Gilgit-Baltistan (GB). The survey was conducted by the Aga Khan University with the support of EPI Pakistan from September 2020 to January 2021.

Overall, 8,759 clusters, 109,123 Households (HHs), and 110,790 children were covered in the TPVICS. Children born between September 2018 to January 2019 were enrolled in the survey. Of the children covered, more than half 59,872 (54.1%) were male, while 50,918 (45.9%) were female.

The survey results reflect immunization coverage in the country has improved as compared to previously conducted national surveys such as National Nutrition Survey (NNS) 2018, and Pakistan Demographic and Health Survey (PDHS) 2018. TPVICS found that immunization coverage varies amongst different vaccine antigen in the country. At the national level excluding AJK and GB, the survey found that 76.4% of the children aged 12-23 months were fully immunized. Fully immunized is defined as a child who has completed their immunizations till Measles dose 1 (given at 9 months of age) as per the EPI schedule except Rotavirus vaccine. Rota vaccination is not required for the child to be considered fully immunized in the survey. A vast majority of children (93.3%) of the target

group were immunized with the Bacille Calmette-Guérin (BCG) vaccine, while 83.5% were immunized with Penta 3 antigen. Furthermore, two-third (66.2%) of mothers presented immunization cards of their children to the surveyors.

One of the key indicators (DLI1) of the survey was to assess the coverage of full immunization among children aged between 12-23 months in the project provinces. Under NISP, the third-year target of Fully Immunization Coverage (FIC) for the provinces was 75%, 65%, 75%, and 35% for Punjab, Sindh, KP, and Balochistan respectively. DLI targets do not cover the federal regions (AJK, GB, Islamabad, and Khyber Pakhtunkhwa Newly Merged Districts (KP-NMD). (Table 7).

The survey confirms that Punjab and Balochistan have achieved the DLI 1 target set for year 3 of NISP. The coverage of full immunization was reported as 89.9% [CI: 89.0 - 90.8] in Punjab and 37.6% [CI: 35.1 – 40.1] in Balochistan. On the other hand, the provinces of Sindh and KP did not achieve the year 3 DLI 1 target of NISP. About 61.1% [CI: 59.7 - 62.6] of the eligible children in Sindh and 68.4% [CI: 66.7 - 70.1] in KP were fully immunized against their provincial targets. In the federal regions, GB had 73.3%, Islamabad 70.8%, AJK 88.8%, and KP-NMD 42.8% fully immunized children. The full immunization coverage in the country is highly diverse across the provinces as reflected in the DLI1 results.

The second indicator covered by the survey is DLI 3 of NISP which tracks the percentage of districts in each province reporting at least 80% coverage of penta3 immunization among children aged between 12-23 months. The third-year targets for DLI 3 are: 75% for Punjab, 70% for Sindh, 40% for KP, and 20% for Balochistan. The TPVICS confirmed that Punjab and KP achieved their respective targets, while Sindh and Balochistan did not achieve it. All the districts in Punjab reported more than 80% coverage of Penta 3 immunization, while 40% of the districts in KP achieved the targeted Penta3 immunization coverage. Only, 24% of the districts in Sindh, and 6% of the districts in Balochistan achieved at least 80% coverage for DLI3 target. Regionally GB had 70% and AJK had 100% of their districts with at least 80% Penta3 coverage. District Islamabad achieved at least 80% Penta3 coverage. In KP-NMD none of the districts reached 80% Penta3 coverage. A large inter-district variation within provinces especially in Balochistan was identified regarding Penta3 coverage, where it ranges from 8.8% to 89.9% among the districts.

Vaccination cards are considered a quality measure in vaccination services and one of the reliable sources of information about vaccination history. Increasing card retention is one of the key measures to evaluate robust coverage. The third indicator covered by TPVICS is DLI 8 which tracks vaccination cards retention by families with children under two years of in each project province. Year 4 targets under NISP for DLI 8 are: 50% for Punjab, 80% for Sindh, 55% for KP, and 30% for Balochistan.

TPVICS found that Punjab and KP have achieved the year four DLI 8 target. In Punjab, 80.8% [CI: 79.7 - 81.9] of the children's parents against the target of 50% were found to retain the vaccination cards, while KP was 57.3% [CI: 55.7 - 58.9]. Sindh and Balochistan did not achieve the DLI 8 target for card retention, whereas card retention rate in Sindh was 50% [CI: 48.5 - 51.6] against the provincial target of 80%, and Balochistan was 19% [CI: 17.3 - 20.7] against the provincial target of 30%. Regionally KP-NMD had 40.4%, GB had 52.5%, Islamabad had 61.7%, and AJK had 76.4% card retention.

The fourth indicator covered by TPVICS is DLI 10 of the NISP which tracks FIC among children aged 12 to 23 months in ten urban cities (Islamabad, five cities from Punjab, two from Sindh, and one each from KP and Balochistan). From these cities, around 8,615 children were covered by TPVICS and 74.5% of children were found to be fully immunized. The coverage rate in these cities is lower than the national fully immunization coverage (76.4%). Furthermore, intercity FIC varied from 45.6% in Quetta to 97.1% in Multan with a higher FIC observed in the cities of Punjab province.

The survey presented a mixed picture in the context of DLIs target achievement. In summary, the first target DLI1 of the TPVICS was achieved by Punjab and Balochistan, whereas the target indicator for second (DLI3) and third (DLI8) was achieved by Punjab and KP.

To further improve immunization coverage in Pakistan, concerted efforts are needed to maximize the coverage in underperforming districts by increasing focus on supervision, monitoring and evaluation and considering performance-based incentives. Efforts and resources required to strengthen capacity of district based EPI team to better deliver services to targeted children. It is also recommended to develop district specific strategies, that are better aligned with the local norms, by exploring partnerships with the private sector.

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1. Background

Pakistan is the 6th most populous country with an estimated population of 208.5 million people [5]. The population is projected to reach 228.8 million by 2050 with the current growth rate [5]. The country faces some of the highest rates of childhood mortality in the world. It is a global leader in under or unimmunized population [6]. The current mortality among the infant and neonatal children is 60, 41 per 1000 live births respectively as estimated by Pakistan Social & Living Standards Measurement Survey (PSLM) (2018 -19) [7]. While for children under five years of age, the mortality rate is estimated at 74 per 1000 live births [4]. In addition to that, Pakistan is one of the two countries in the world, where polio is still endemic [8]. Immunization is a high priority for the government of Pakistan and an important part of making progress to universal health coverage and building resilient health systems. However, the country is third in row in terms of highest number of unimmunized children (1.2 million) in the world, after Nigeria (approximately 4 million) and India (2.9 million) [9].

Therefore, the Government of Pakistan with the help of donor agencies has taken major initiatives including Expanded Program on Immunization (EPI), and later National Immunization Support Project (NISP) to reduce child mortality and improve immunization coverage among children against the Vaccine-Preventable Diseases (VPDs).

Reducing child mortality has been an important part of the global development agenda, previously articulated as the Millennium Development Goals (MDGs) (with goals 4 and 5 about these objectives) and now has been translated into the framework of Sustainable Development Goals (SDGs) in 2015 [10]. Goal 3 of the SDGs deals with health "ensure healthy lives and promote wellbeing for all at all ages". Two of the targets of this goal are, to end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births by 2030.

Realizing the need for effective public health intervention, the World Health Organization (WHO) initiated the Expanded Program on Immunization (EPI) globally in May 1974 [11]. The primary objective was to vaccinate mothers against tetanus and their children against six deadly diseases: Tuberculosis, Poliomyelitis, Diphtheria, Tetanus, and Measles. Later the number of VPDs increased to 10, with the introduction of new vaccines e.g., Hepatitis B, Haemophilus influenzae type b (Hib), Pneumococcal vaccine (PCV10), and Inactivated Polio Vaccine (IPV1) [6]. These vaccines were also added to EPI in countries where there was a high burden of diseases. Moreover, WHO also developed a monitoring and evaluation

of immunization program through a modified cluster survey sampling method in countries that lack a proper health infrastructure [12].

Pakistan adopted the EPI with its goals and strategies, following the priorities set at the global and regional level. The program began in the country in 1976 on a pilot scale and was later expanded countrywide in1978 [13]. The VPDs were added to the EPI Pakistan with their introduction at the global level. At present, the EPI covers 10 VPDs in the country. Despite significant efforts by the Government and its partners, Pakistan's immunization indicators have yet to reach the expected benchmarks. The key goals of polio eradication, and measles, have not been achieved [6] as the country experiences continued incidences of endemic polio transmission and periodic measles outbreaks. Among the myriad reasons for low immunization coverage such as limited access to services, lack of awareness among communities, low socioeconomic status, and parental education, and gaps in vaccination service delivery, the EPI also faces inefficiency and unsustainability caused by the fragmented financing structure of the program and lack monitoring and evaluation system. Further, in the aftermath of the 18th Amendment, when the subject of health was devolved to the provinces in 2010, the capacity building of the provincial governments became inevitable to achieve increased access, accountability, ownership, and equity in immunization programs [14].

After a series of deliberations, the government of Pakistan came up with the proposal of the NISP as a financing mechanism for a comprehensive multi-year plan (CMYP)[1] for immunization. It sought financial support from Gavi the vaccine alliance, the World Bank, and the Bill and Melinda Gates Foundation (BMGF) [14, 15]. The same proposal was approved by the donors and its implementation started in 2016 in the country.

Intending to increase equitable coverage of services for immunization against VPDs, the NISP aimed to strengthen the existing EPI initiative through financial investment, programmatic reform, and efficiency improvement. Contrary to the fragmented approach of financing, the NISP consolidates the multiple donors and Government of Pakistan (GoP) sources of funding in the form of Multi Donors Trust Fund (MDTF) for the co-financing [14]. And NISP is designed to use a results-based approach using Disbursement Linked Indicators (DLIs), for the EPI across the country.

Measurement of progress on immunization is essential for planning and also for accountability of achieving DLIs, but third-party verification is needed to ensure the validity and quality of data collection

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[1] For strengthening the EPI services WHO supported the development of comprehensive multiyear plan (CMYPs) for federal and provincial EPI programs in Pakistan.

and verify the achievements and outcomes of the program. As the Government of Pakistan is currently implementing NISP in the country, World Bank (WB) and the Bill and Melinda Gates Foundation (BMGF) are partnering with the government. And these partners are facing challenges in assessing estimates of the immunization coverage which are linked with the DLIs agreed for the implementation of the NISP. Under the DLIs mechanism, the funds would be disbursed to the provinces on the achievement of desirable results after the verification by Federal EPI through a third party. The year-wise DLIs targets for each province under NISP are provided below.

Table 1. Province wise DLIs targets

DLI#	Indicators	Targets	Punjab	Sindh	KP	Balochistan
1	Percent of children aged between 12-23-month- old in each project province who are fully immunized (Year 3& 5).	Year 3	75%	65%	75%	35%
		Year 4	-	-	-	-
		Year 5	80%	80%	80%	50%
3	Percentage of districts in each project province reporting at least 80% coverage of Penta3 immunization in children between 12-23-month-old, as validated by a third party (Year 3 & 5).	Year 3	75%	70%	40%	20%
		Year 4	-	-	-	-
		Year 5	80	80	60	30
8	Percent of children under two years of age with vaccination cards available in each project province **(Year 4)**.	Year 3	-	-	-	-
		Year 4	50%	80%	55%	30%
		Year 5	-	-	-	-

Weak governance and accountability mechanisms [15], and lack of quality data collection and management [16] have impeded the assessment of EPI performance in Pakistan. Therefore, to assess the estimates of immunization coverage more accurately, to make future policy decisions more informed, and disbursement of resources to the provinces based on their DLI performance, third-party verification is needed. Such verification will ensure the validity and quality of data collection and verify the achievements and outcomes of the program.

In this background, World Bank, National Immunization Program Pakistan, and key partners supporting NISP decided to carry out a third-party verification immunization coverage survey in Pakistan. The aim is to independently verify and ascertain transparently, the validity of the data reported by the provinces, and districts, on immunization coverage in years three and five of the NISP project. The findings will also help all the stakeholders, to gain a renewed insight into the current immunization status of children and hence in turn will help prioritize interventions and implementation in the country.

1.1. Objectives of TPVICS

The detail of the agreed primary and secondary objectives of the survey are presented as under:

1.1.1. Primary Objectives

To verify progress reported by provincial EPI programs, in agreement with Federal EPI, on four out of the ten Disbursement Linked–Indicators (DLIs) under the NISP.

- DLI 1: Percentage of children aged between 12-23 months in each province who are fully immunized.
- DLI 3: Percentage of districts in each province reporting at least 80% coverage of Penta3 immunization in children between 12-23 months of age.
- DLI 8: Percentage of children under two years of age with vaccination cards available in each project province and,
- DLI 10: Percentage of children aged 12 to 23 months in each targeted city who are fully immunized.

1.1.2. Secondary Objectives

The secondary objectives are to provide additional data on indicators that measure demand-side issues impacting immunization coverage rate in Pakistan such as:

- Estimate the differences in immunization coverage across different wealth quintiles,
- Determine the coverage of BCG, four doses of OPV, three doses of DTP-HepB-Hib pentavalent vaccine, three doses of Pneumococcal conjugate vaccine (PCV10).
- Assess the sources of vaccinations; reasons for not vaccinations; vaccination card availability.
- Assess the coverage by urban/rural residency, sex of the child, level of maternal education, and household living standards.
- Ascertain the reasons for the lack of utilization of vaccination services across the country.
- Determine the coverage at provincial and national levels.

The Center of Excellence in Women and Child Health, Aga Khan University (AKU) with the support of partners, completed the process for implementation of district-specific TPVICS in 152 districts of Pakistan including AJK and GB. Financial support for TPVICS was provided by the World Bank for the implementation of the survey in four provinces and Islamabad whereas, GB and AJK were funded by

BMGF. AKU worked with the guidance of the sub technical committee established to support the processes of the design and implementation of the TPVICS. The sub technical committee has been constituted as approved by the Pakistan Inter-agency Coordinating Committee (ICC), Sub-committee on Surveys including representation from Federal and Provincial Governments and Co-financing partners (GAVI the Vaccine Alliance, WHO, BMGF, and World Bank) supporting the NISP. The Aga Khan University collaborated with the PBS for technical guidance on sample design and obtaining sampling frame for TPVICS from the Population Census of Pakistan, 2017.

2. Survey Design and Methodology

This section discusses the sample design of the survey and the questionnaire design employed in the survey for data collection under the agreed objectives.

2.1. Sample Design

The summary of the survey design is explained in the underneath table.

Table 2. Summary of survey design

Survey Design	Two rounds of cross-sectional surveys at year 3 and 5 of National Immunization Support Project (NISP)
Target age group	All children of age 12-23 months are listed as a member of the household.
Unit/Domain of analysis (Strata)	Samples from all Primary Sampling Units (PSUs)/Clusters were aggregated at the District level and analysis was conducted on districts and then on upper administrative levels i.e., Division, Province, and National Level. Three districts in GB were merged with nearby districts considering population and coverage as there are less than 100 PSUs in the sampling frame of PBS for those districts.
Sampling Design and strategy	The expertise of PBS was utilized to determine the sampling frame of the survey. The sampling design developed for the first round was used for the second round of TPVICS after endorsements from the sub-technical committee.
Selection of Primary Sampling Units	A two-staged cluster sampling technique was adopted for the implementation of TPVICS. *Stage I:* The PBS selected the required number of the PSUs/Enumeration Blocks (EBs) from each district considering the rural and urban proportion and provided the list of PSUs with necessary identification information and boundaries demarcations. The PBS used the Census 2017 sampling frame for this purpose. *Stage II:* Households with children of age 12 – 23 months were treated as Secondary Sampling Units (SSUs) within PSUs and were selected randomly using the fresh household listing.
Survey Instruments	Structured questionnaires were used to obtain survey data. The questionnaires were designed as per WHO guidelines and manuals, and suggestions from stakeholders were incorporated. Three questionnaires were used to collect data i.e., one for line listing, the second for household survey component, and the third for immunization data of an eligible child.

Selection of Sampling Units:

PBS took care of the process for the selection of the PSUs in all targeted areas of Pakistan surveys. PBS selected the required number of the PSUs/EBs from each district considering the rural and urban proportion and provided the list of enumeration blocks with necessary identification information (name/code and other relevant details) and boundaries demarcations. The current methods adopted by the PBS for the categorization of clusters was by urban-rural classification.

Sample size Estimates:

The sample size estimates had been finalized after a series of meetings with key technical stockholders and as per the recommendation of the World Bank in ToR. The summary of the estimated sample size and required primary sampling units is as under:

Estimated Immunization Coverage:

The Coverage Evaluation Survey (CES) provided estimates on coverage of several equally important measures i.e., full Immunization, doses of DTP-HepB-Hib, Polio, Measles, etc.; for sample size calculation, the most conservative estimate of 50% coverage had been considered for districts with coverage <80% and 80% for districts with coverage of >80%.

- **Desired Precision:**

  Absolute precision of ± 5.5% at district level was taken.

- **Design Effect:**

  As per WHO 2018 recommendations, a design effect of 2.5 was assumed.

- **Sample Size:**

  Preliminary calculations suggested that a sample of 13 children 12 – 23 months of age in each cluster per district would meet these requirements. Sample size and design had been finalized in consultation with the team of WHO, BMGF, GAVI, National EPI, and PBS.

- **Cluster and Household Selection:**

  Required cluster or enumeration blocks were selected by PBS from each district on an equivalent basis. Following cluster selection, trained listing teams visited each cluster. Cluster boundaries were determined using cluster maps obtained from PBS and local guides/knowledgeable persons. Using standard household listing guidelines, all structures/dwellings visited, and households

listed. In the second stage, the selection of eligible households/children was done by the central team at the Provincial/Divisional level.

2.1.   Questionnaires

Three sets of questionnaires were used in the survey: 1) a household line listing questionnaire to collect household information about key demographic indicators to generate a sampling frame for the selection of target households. 2) a household questionnaire which was used to collect basic demographic information on all de jure household members (usual residents), the household, and the dwelling. 3) a questionnaire for eligible children of 12-23 months to assess immunization coverage in each targeted household. Questionnaires had been adopted from the WHO Vaccination Coverage Cluster Surveys reference manual 2018 and modified as per the objectives of the survey. Questionnaires had been translated into the local language (Urdu) and translated back to English. Around 1000 interviews were conducted in different locations of Pakistan in households with eligible children to identify any potential problems with the survey instruments and protocol. The final version of the questionnaires had been shared with the representatives of key project stakeholders for their review, feedback and was shared with members of the Technical Committee meeting for their review and endorsement.

Before starting of survey field activities in all provinces, territories, and districts of Pakistan; a pilot survey was conducted in 20 different locations of the country. This exercise was done in all non-targeted PSUs selected by PBS for the selected districts. All steps of the survey were undertaken in the pilot exercise including the methodology, instruments, SOPs, guidelines, data analysis plan, etc. Revisions were made based on the lessons learned in the pilot survey.

The standard operating procedures for data collection and manuals, each for household listing and household data collection from the caretaker of eligible children were developed to describe the procedures for TPVICS line listing and household survey.

3. Implementation of Survey

The approach and methodology were divided into three major phases presented in the figure below:

Figure 1. Phases of TPVICS implementation

3.1 Inception Phase	3.2 Implementation Phase	3.3 Data Analysis and Sharing

3.1. Inception Phase

The inception phase was started by getting No Objection Certificates (NOCs) and approvals from provinces and regions of Pakistan with the support of provincial and regional program leadership.

Key activities in the inception phase included the contract finalization, approvals from ethical review committees, NOCs from Provincial and District authorities, validation of sampling approach by PBS, identification, hiring and training of staff, and logistic arrangements for survey operation.

Task wise details of the inception phase are as under:

1) **Ethical Approvals:** The AKU team prepared and submitted applications to the National Bioethics Committee (NBC) and AKU Ethical Review Committee (ERC) for approval to implement proposed survey activities in target areas of Pakistan. ERC approvals from both committees had been acquired.

2) **Letter of support from the project director of national and provincial expanded program of immunization:** The National Program Manager EPI, Ministry of National Health Services Regulation & Coordination (MoNHSRC), Islamabad issued the support letter on November 13, 2019, to all provincial and regional authorities for support and facilitation of TPVICS activities.

3) **No Objection Certificates (NOCs) and approvals from provincial authorities:** NOCs and approvals from respective provinces for survey operations regarding the support letter issued by MoNHSRC were obtained in January 2020.

4) **Collaboration with Pakistan Bureau of Statistics (PBS)**: PBS was a key collaborator of TPVICS and responsible for technical assistance in the finalization of sampling design and provide a sampling frame for the evaluation along with maps of all selected PSUs. It provided the sampling frame for TPVICS.

5) **Inception meetings with key program authorities:** AKU had formally informed all provincial

authorities on TPVICS design, scope, and implementation plan. Keeping in view the COVID-19 pandemic, AKU approached authorities again before the launching of field operations.

6) **Meetings with the technical team of the funding agency and program authorities:** Series of meetings were conducted by the AKU team with the technical team of BMGF, WB, National EPI Program, and WHO for the consensus on new developments and recommendations.

7) **Logistic arrangements for evaluation implementation**: Required supplies and logistics were arranged for survey operations.

8) **Development of manuals and standard operating procedures:** The standard operating procedures for data collection and manuals were developed to describe the procedures for TPVICS line listing and household survey.

3.2. Implementation Phase

The key activities carried out during the implementation phase of the project are stated as follows:

- The Hiring of Field Teams for Data Collection and Supervision
- Training (Master and Cascade Trainings)
- Survey Timeline

3.2.1. The Hiring of Field Teams for Data Collection and Supervision

The hiring of the survey implementation team was initiated in two phases. In phase one, the core team including data supervisors, programmers, master trainers, district supervisors, regional and provincial managers were hired. In phase two, a district-specific team for data collection and line listing were hired. In each district, three teams, consisting of one team leader, two female data collectors, and one data entry operator/logistics assistant were hired for the household survey. Provincial and regional managers were responsible for district-specific hiring with the support of district supervisors.

Provincial Managers were responsible for obtaining permissions from provincial health and administrative authorities for survey implementation and they were also responsible for the finalization of district-specific hiring and training of field teams with the support of regional coordinators. Provincial managers were also coordinated with the PBS for acquiring district-specific sampled maps. Provincial and regional managers were also responsible to conduct quality checks by revisiting a portion of households already surveyed to verify that the household listing and interviews were conducted properly, that all eligible respondents in those households completed questionnaires, and that vaccination dates (and possibly

other responses) were recorded correctly in homes where cards were available.

Regional Coordinators were responsible for the fieldwork in one or more strata of the survey. They checked the quality of maps and micro-plans. Similarly, they coordinate with supervisors on regular basis and to discuss the progress and plans in accordance with the quality of the data collection. Regional coordinators also work to ensure consistent responses to unforeseen developments.

District Supervisors were responsible for coordination with the district authorities, apprising them of the survey activities and coordination with the provincial/regional managers for day-to-day progress and plans. District supervisors report daily to regional coordinators, and in turn, the regional coordinators report the progress up to the provincial managers.

Team Leaders were responsible for day-to-day supervision, monitoring, coordination, and providing logistical support to the team. Team leaders were also responsible to revisit a set of households to ensure the accuracy of data.

Data Collectors were responsible for visiting sampled/selected households for interviews and complete the filling of forms. Also, the data collectors were responsible to check the completed forms and, where required, revisited the households to correct any discrepancies or obtain missing information.

Data Entry Operator (DEO) was responsible for data entry with the concerned data collector where data collectors were not able to directly enter the data on handheld devices due to reluctance of respondents or some other issues. In cases where data collectors gathered data on paper-based forms, the DEOs were responsible for data entry on the same day with the support of the concerned enumerator.

For the Line Listing, three teams, with each team consisting of three-line listers, were hired in each district for the line listing/mapping of households. The line listers worked independently to identify the boundaries of the selected clusters/PSUs, did the household listing, and completed the household listing questionnaires. The three teams of line listers (9 in total) were able to cover all selected PSUs in a district in four weeks. District supervisors oversee household listing teams to ensure the household listing had been done correctly and tallied eligible respondents in each home. Line Listers also accompanied the data collection team to assist and guide them in the identification of areas and target households.

During the hiring of the field teams, it was ensured that they have sufficient qualification, field-based data collection experience, fluency in the local language, and willingness to travel. District-specific networks were used for the hiring of experienced enumerators and supervisors who have had worked with AKU in

past. Preference was given to those candidates who were locals, were well versed with local languages and culture, had the experience of working in similar large-scale surveys, and could operate data collection handheld device.

3.2.2. Training and Field Work

Training of project staff was conducted in three stages. The description of the training is provided below:

- **Training of master trainers:** After finalization of the questionnaire from the Technical Committee, a Training of Trainer (ToT) for master trainers was organized from August 18 to 21, 2020 in Karachi under the facilitation of investigators and faculty members of Aga Khan University. Key trainers from WHO and program authorities were facilitated sessions on the procedures of implementation of routine immunization. Subsequently, Master trainers conducted cascade training for team leader, enumerators, and line listers at the regional and district level under the supervision of the Project Core team.

- **Cascade training of enumerators and supervisors:** Three-day division-based training was organized for the field teams. Team leaders and enumerators were trained using the survey questionnaires on handheld devices and were encouraged to give comments and suggestions to contribute towards the improvements in conceptual clarity of the participants. An important additional benefit of this exercise was to provide an environment where the enumerators understand the deliverable and the reasons behind each question. This exercise also enabled field staff to probe more effectively while conducting the interviews in the field. On the last day of the training, teams were sent to a nearby location and the questionnaire was tested in the field. This pretest after training ensured field staff comprehension over the survey questionnaires and field protocols. A feedback session with the enumerators was also conducted to address their comments and issues. To measure the impact of training on the knowledge and skills of participants, pre and post-tests were conducted. Capable enumerators who passed the final test were deployed for the actual survey. Apart from this, each enumerator was observed during the data collection process to assess their performance, and feedback was provided accordingly.

- **Cascade trainings of household listing staff:** Apart from the enumerators' training, two-day training sessions were organized for line-listers of each survey district. They were provided in-house and outdoor training on the procedures of the household survey using the household listing manual developed for this project. Special emphasis was given on accurate age determination of

children targeted for the survey and coverage of the areas as per the identifiers mentioned in the approached maps of the PBS. Line listers were trained to locate the clusters with the support of approached maps as well as local PBS staff wherever required. They were also trained regarding the segmentation process of clusters as per the PBS guidelines mentioned in the inception report.

3.2.3. Data Processing and Analysis

Data collection of TPVICS was implemented in two phases. In the first phase data collection in target districts of Punjab, Sindh, Azad Jammu Kashmir (AJK), and Gilgit Baltistan (GB) provinces were carried out whereas, in the second phase, data collection in districts of Khyber Pakhtunkhwa (KPK) and Balochistan was conducted.

Data collection was implemented in two stages in each district. In the first stage, household line listing was conducted in the selected Primary Sampling Unit (PSU). The Household listing was used for the selection of targeted 13 eligible households for survey in each PSU.

Stage two was dedicated to the collection of information on household socio-economic status and information about routine immunization of children 12-23 months of age from the sampled 13 households in each PSU. Two custom-made data collection applications were designed using native Java language for the interface / front end with SQL Lite running at the backend. These applications were used to record the data for household line listing and to capture data of the household interviews. The data collection applications were android compatible. The data stored in the handheld devices were transmitted to the AKU data Center using internet connectivity. At the AKU data Centre, a dedicated database hosted on Microsoft SQL Server was used to store and retrieve the data received from the handheld devices. For error checking, cleaning, data analysis, and final storage, data was transferred into STATA version 16.1. Data backups were taken as per shared DMU Data Back-up SoP.

A dedicated "TPVICS dashboard" was also developed to provide live information on the progress of data collection activities. TPVICS dashboard also offered other features including a facility for the survey managers to randomly select households, access soft copy, or print the list of randomized households for each PSU. Access to the dashboard was also provided to key partners to check the day-to-day progress of the field activities.

Effective supervision and monitoring are key to the success of any project. Therefore, the survey activities were regularly and rigorously monitored through the dashboard and in-field by the supervisors/managers.

The district-level data collection was supervised by the district supervisors and monitored by the regional manager, who was specially trained to supervise this task as well during master training. All filled-in data was checked by the team leader/supervisor on the field for completeness before leaving the field. After completing their work, they returned to the office, checked their collected data on the dashboard. The team leader checked the entire filled questionnaires for completeness, accuracy, and immunization card visibility. The regional manager and district supervisors were responsible for reviewing immunization cards on the dashboard to ensure the quality of data transcription by data collectors. The district supervisors were also responsible for timely syncing of line listing data and acquisition of randomization sheets as well as syncing of the household data along with the immunization cards.

Following steps were ensured during monitoring and quality control in the field:

- Each data collector was expected to submit/sync only completed and accurate questionnaires. Every day, the supervisor checked data for completeness and timely syncing. The supervisor checked the household list indicates that questionnaires had been completed for all eligible children, and if not, the reasons were recorded for missing questionnaires (for example, caretaker not available after two visits or refused to participate). All forms were checked and corrected before leaving the cluster area and syncing of data. The district supervisor/team leader gave feedback immediately to interviewers

- About any discrepancies, corrected the discrepancies, and discussed steps to improve the next day's work. Any discrepancy or missing data was resolved through discussions with the interviewers, a review of photographs of the vaccination card (if available), or revisits to households if necessary.

- Further, to ensure the quality of the data collected, the team leader/district supervisor validated household listing activities to check that the household lists have been done correctly, cluster or segment boundaries were correctly identified, and that field workers did not skip (either intentionally or by mistake) interviews for eligible children and to tally eligible respondents in each home. The selection of clusters was based on data indicators related to the number of listed households and eligible children. Clusters with a smaller number of reported household and eligible children as per trends and expectations and doubts on specific indicators were selected for validation.

- A dedicated quality control associate at the data management unit reviewed pictures of immunization cards taken by survey teams and compared them with the results of the survey to

validate the quality of data transcription by data collectors. This exercise was very helpful to timely notify teams about the typo and any other possible errors.

- **Data Analysis:** TPVICS was designed to provide estimates of key indicators at district level. Analyses were performed after data cleaning and satisfactory quality assurance. Sampling weights were added to the data at cluster level as provided by the PBS, to account for unequal selection probabilities and non- response. A standard survey module was used to take into account the multi-stage survey design including stratification, clustering, and sampling weights. Descriptive statistics for the subjects were estimated and reported as mean (±SD) and proportion as appropriate. The analyses presented in TPVICS estimated results at district level with population subgroups such as sex of the child, maternal years of education, residence (urban/ rural), economic status, districts, and regions of the country. Data analysis was undertaken using STATA version 16.

3.2.4. Timelines for Survey Implementation

Since Pakistan was and still is under the active epidemic of COVID-19 and the exceptional circumstances delayed the data collection activities especially in those areas where the cases were clustered. However, AKU staff continued to conduct field activities adhering to the guidelines of COVID for reducing risk and exposure. Field activities, including travel, were suspended in localities where there were an active transmission and wide community spread. Planned routes of travel to and from field locations were developed to either circumvent these areas or minimize encounters with the public and local authorities while transiting through. All field staff was trained on the precautionary methods to avoid COVID and necessary personal protective equipment (PPE) such as gloves, masks, and sanitizers were provided to the entire field staff. Survey activities were initiated after slight normalization of the global coronavirus pandemic. Considering the situation, survey activities were implemented as follows.

Table 3. Timelines for survey implementation

Provinces	Start date of HH data collection	End date of HH data collection
AZAD JAMMU & KASHMIR	19-Sep-20	11-Dec-20
BALOCHISTAN	10-Sep-20	3-Feb-21
GILGIT-BALTISTAN	9-Sep-20	3-Nov-20
ISLAMABAD	22-Sep-20	5-Nov-20
KHYBER PAKHTUNKHWA	15-Oct-20	20-Jan-21
PUNJAB	4-Sep-20	30-Nov-20
SINDH	5-Sep-20	3-Dec-20

4. Survey Results

The survey results are presented in four sections. In Section A, findings related to survey coverage, and household characteristics of national demography are presented. In section B findings of primary objectives are described. A comparison of the findings of PDHS-18, NNS-18, and TPVICS for the primary objectives are provided in Section C, while in section D, findings of secondary objectives are presented.

Section A: Survey Coverage and Household Characteristics of National Demography

The survey targets and the basic characteristics of national demography are presented in this section.

A.1. Survey Target and Coverage

The survey covered a total number of 8,759 clusters across the country against 8,786 target clusters. In total, 109,123 Households (HHs) were covered nationally against the target of 114,218. The overall response rate for the HHs coverage was recorded at 96.5%. Across the provinces and regions, the highest response rate of 99.4% was recorded in Punjab followed by 99% in AJK. In the remaining regions, the response rate was recorded as, Islamabad 98%, GB 95.8%, Balochistan 95.6%, Sindh 95.5% , and both KP-NMD and KP recorded response rate of 94.9%.

A district wise detailed summary of PSUs, sampled and covered by TPVICS after dropped areas is provided in table 5. The table also provides urban and rural segregation of PSUs in each district.

Table 4. Survey target and coverage

Level	Clusters			Households			
	Sampled	Randomized	Surveyed	Target	Randomized	Completed	Response rate (%)
Pakistan	**8,786**	**8,759**	**8,759**	**114,218**	**113,057**	**109,123**	**96.5**
KP	1,386	1,378	1,378	18,018	17,878	16,967	94.9
PUNJAB	1,839	1,839	1,839	23,907	23,898	23,763	99.4
SINDH	1,856	1,855	1,855	24,128	24,086	23,006	95.5
BALOCHISTAN	2,112	2,094	2,094	27,456	26,591	25,431	95.6
ISLAMABAD	113	113	113	1,469	1,468	1,439	98
GILGIT-BALTISTAN	433	433	433	5,629	5,628	5,390	95.8
AJK	580	580	580	7,540	7,540	7,462	99
KP-NMD	467	467	467	6,071	5,968	5,665	94.9

A.2. Basic Characteristics of National Demography

The survey covered 110,790 children across the country including 59,872 (54.04%) male and 50,918 (45.96%) female children. The proportion of male children covered in TPVICS was in majority across all the regions and provinces of Pakistan, except Islamabad where it was found to be 48.9%. The highest percentage level was recorded in KP-NMD (56.6%) and Balochistan (57.7%). The information on the demographic characteristics of the regions and provinces is provided in table 6.

Regarding the socio-economic status of the HHs surveyed, more than 50% of the HHs in AJK, Islamabad, Punjab, KP and Sindh were in the richest quintile. In KP-NMD and Balochistan, the majority of the HHs (65.1%, 59.9% respectively) were found in the poorest quintile. While in GB, 44.7% of the HHs were in the poorest quintile, 28.3% were in the middle-income group and the remaining HHs were in the richest quintile. Comparatively in Balochistan, KP-NMD, and GB, the majority of the HHs belong to the poor and poorest quintiles.

Concerning the parental education in the regions and provinces, the results revealed that in AJK, GB, Islamabad, and Punjab the mothers were found to be literate[2], while in KP (42.4%) and Sindh (41.5%) mothers had attended one or more years of formal education. Whereas, in KP-NMD (16.9%) and Balochistan (16.6%) mothers were found to be literate. Furthermore, the findings revealed that the fathers of more than 50% of the children had attended one or more years of education in all the regions and provinces, except in Balochistan and KP- NMD, where 21.7% and 30.6% of the fathers were found to be literate respectively. Overall, the literacy rate among fathers was found to be higher as compared to the mothers of the children (table.6).

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[2] Attended one or more years of education.

Section B: Findings of Primary Objectives of TPVICS

The primary objective of the survey was to verify progress reported by provincial EPI programs, in agreement with Federal EPI, on four out of the ten Disbursement Linked–Indicators (DLIs) under the NISP. The province-wise results for each DLI against the set target are presented in table 7.

Table 7. Province wise DLIs targets and status

DLI#	Indicators	Targets and status	Punjab	Sindh	KP	Balochistan
1	Percent of children aged between 12-23 months old in each project province who are fully immunized as per the DLI target of DLI -**Year 3**	Targets for year 3	75	65	75	35
		Status as per the results of TPVICS	89.9% CI: 89.0 - 90.8	61.1% CI: 59.7 - 62.6	68.4% CI: 66.7 - 70.1	37.6% CI: 35.1 - 40.1
			Achieved	Not achieved	Not achieved	Achieved
3	Percentage of districts in each project province reporting target coverage of Penta3 immunization in children between 12-23 months old as per the DLI target of DLI -**Year 3**	Targets for year 3	75	70	40	20
		Status – as per actual Coverage	36/36 (100%)	07/29 (24.37%)	10/25 (40.0%)	02/33 (6.07%)
		Status considering CI upper-bound	36/36 (100%)	13/29 (44.83%)	13/25 (52.0%)	15/33 (45.5%)
8	Percent of children under two years of age with vaccination cards available in each project province as per the DLI target of DLI - **Year 4**	targets for year 4	50	80	55	30
		Status as per the results of TPVICS	80.8% CI: 79.7 - 81.9	50.0% CI: 48.5 - 51.6	57.3% CI: 55.7 - 58.9	19.0% CI: 17.3 - 20.7
			Achieved	Not achieved	Achieved	Not achieved

The DLI one "province wise coverage of fully immunized children aged between 12-23 months" target for provinces was 75%, 65%, 75%, and 35% for Punjab, Sind, KP, and Balochistan respectively in the third year.

Figure.2: Percentage of fully immunized children aged between 12-23 months in each province.
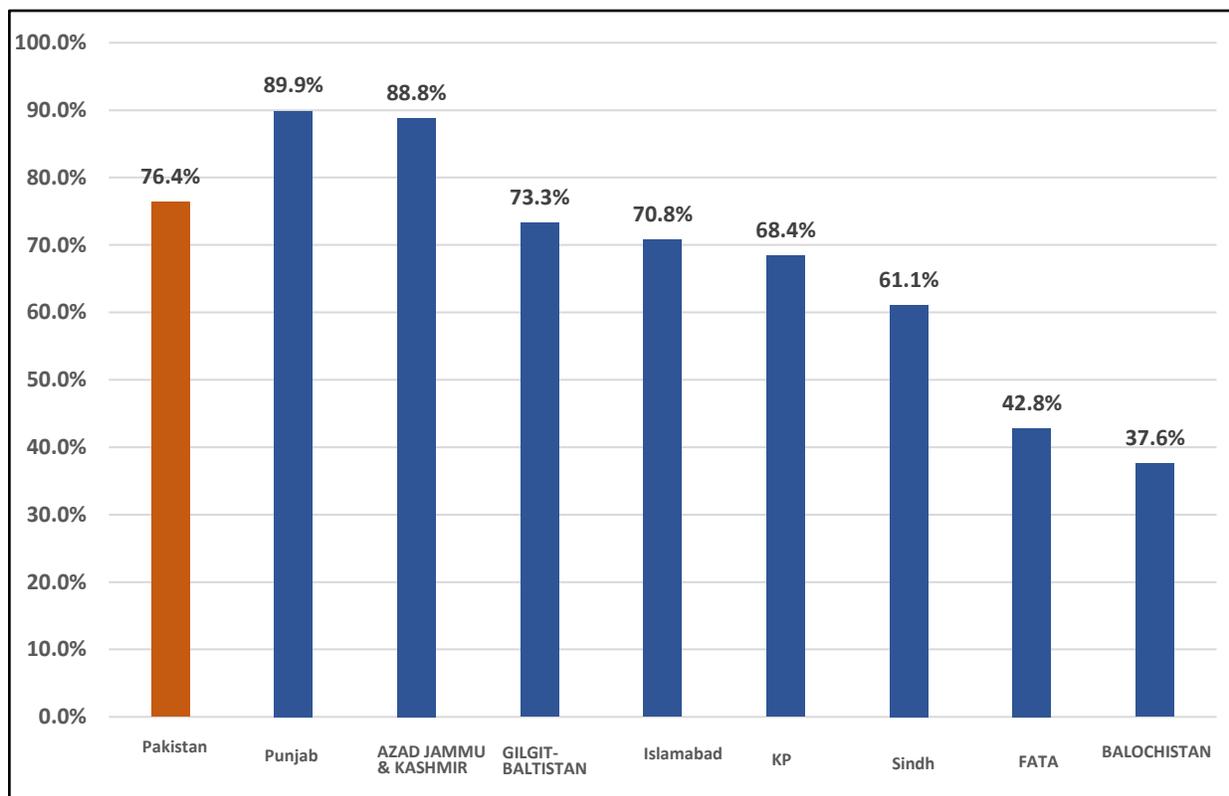
The results reflected that Punjab and Balochistan surpassed the target, while Sindh and KP did not achieve the target. Of the total number of children aged between 12-23 months who participated in the survey from each province, Punjab reported the highest number of fully immunized children. 89.9% [CI: 89.0% to 90.8%] of the children in Punjab were found fully immunized. In KP and Sindh 68.4% [CI: 66.7% to 70.1%] and 61.1% [CI: 59.7% to 62.6%] of the children were respectively found to be fully immunized, while Balochistan reported the lowest percentage of fully immunized children at 37.6% [CI: 35.1% to 40.1%].

The DLI 3 meant to report the percentage of districts in each province reporting at least 80% coverage of penta3 immunization among children aged between 12-23 months.

In our survey, Punjab and KP achieved their respective targets of third-year, while Sindh and Balochistan couldn't achieve the target. All the districts in Punjab reported more than 80% coverage of Penta 3 immunization, while 40% of the districts in KP achieved the targeted Penta3 immunization coverage. Only, 24% of the districts in Sindh, and 6% of the districts in Balochistan reported at least 80% coverage of Penat3 immunization while lagging behind their respective provincial NISP targets of year three. The following table provides the province-wise data.

Table 8. Districts achieved year three DLI target of Penta3 coverage in each province.

Province	Number of Districts achieved year three DLI target of Penta3 Coverage	Total Districts	Percentage of districts achieved year three DLI target of Penta3 Coverage	Penta3 Coverage (%)	Confidence Interval (CI)
PUNJAB	36	36	100	94.9	94.2 - 95.5
SINDH	7	29	24	73.2	71.9 - 74.5
KHYBER PAKHTUNKHWA	10	25	40	74.3	72.7 - 75.9
BALOCHISTAN	2	33	6	42.2	39.7 - 44.6

At the provincial level in Punjab, of the children aged 12-23 months surveyed, 94.9% [CI: 94.2% to 95.5%] were immunized with Penta 3 antigen. All the 36 districts of Punjab reported more than 80% coverage of the Penta3 immunization. The highest coverage was recorded in the districts of Khushab, Mandi Bahauddin, Mianwali, Nankana Sahib and Okara. District level coverage rates for Penta 3 immunization of the province are provided figure.3.

Figure.3: District wise coverage of Penta 3 among children 12-23 months in Punjab
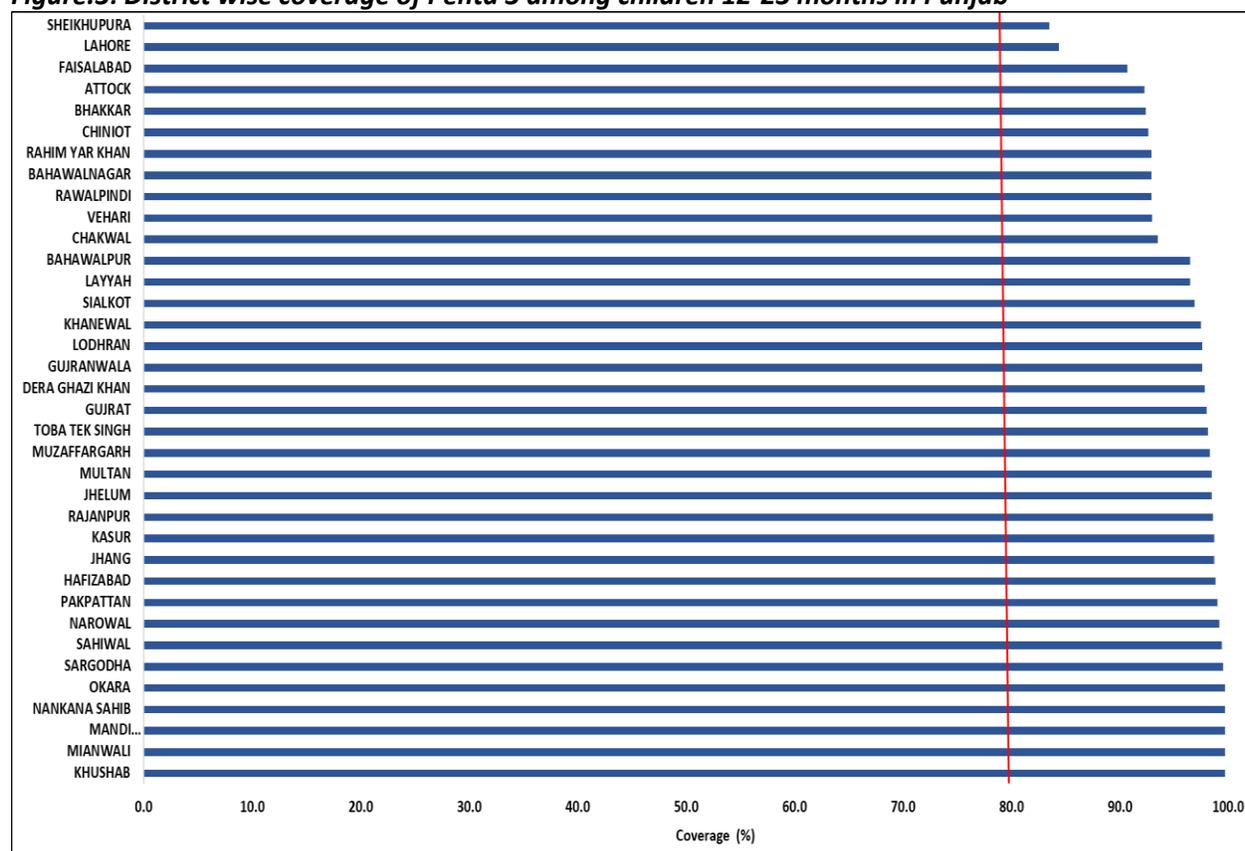
In the province of Sindh, of the eligible children, 73.2% [CI: 71.9% to 74.5%] were immunized with Penta 3 doses. At the district level, 7 out of 29 (24%) districts reported more than 80% Penta 3 coverage among the children surveyed. While in the remaining districts, the coverage remained below the benchmark of 80% with the lowest coverage of 26% in the district of Kashmore. District level coverage rates for Penta 3 immunization are provided and figure.4.

Figure.4: District wise coverage of Penta 3 among children 12-23 months in Sindh
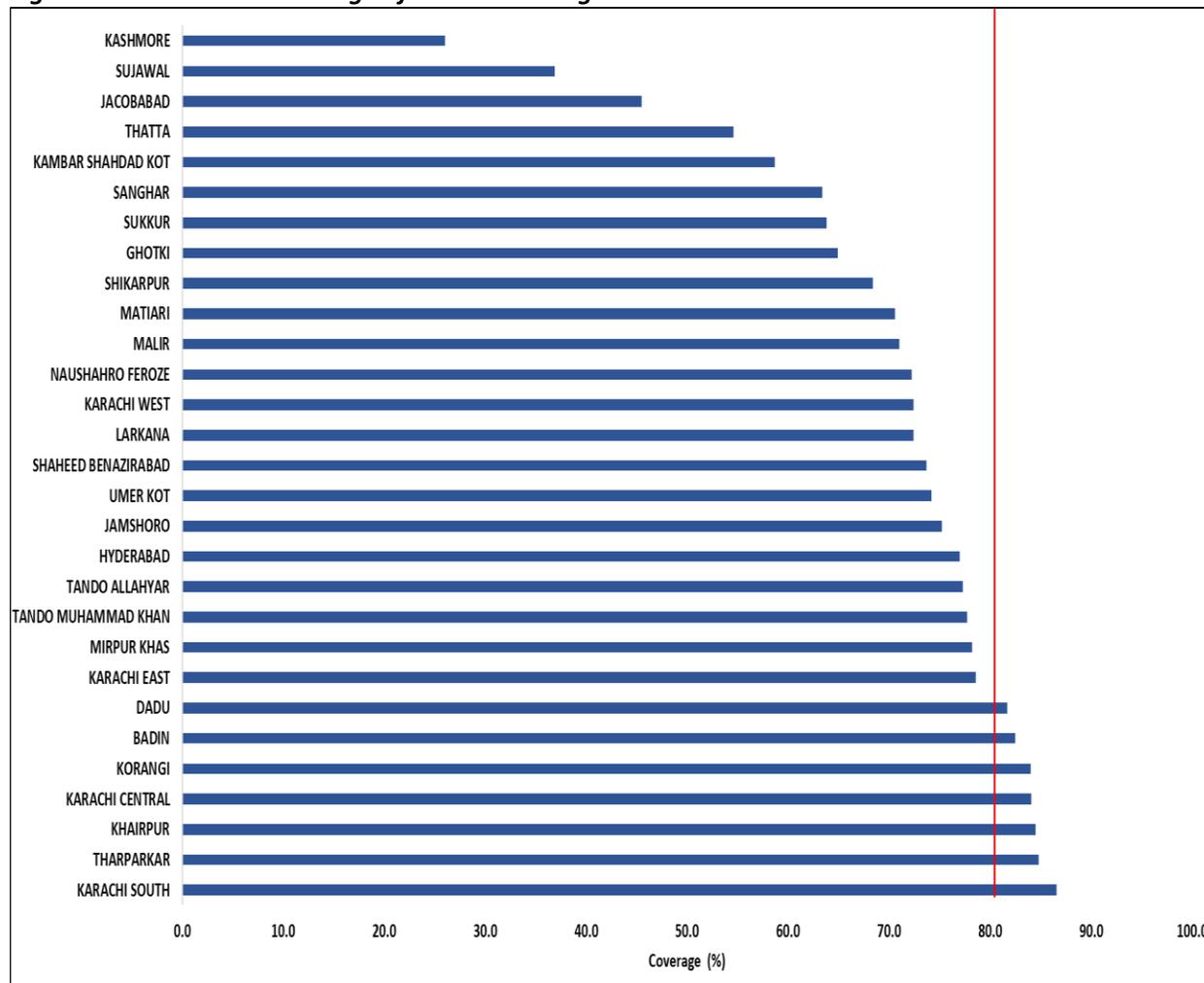
In the province of KP, of the children surveyed, 74.3% [CI: 72.7% to 75.9%] were immunized with Penta 3 doses. 10 out of 25 (40%) districts of the province reported more than 80% Penta 3 immunization. The districts of Kohistan and Lakki Marwat recorded the lowest coverage in the province with 40.2%, and 32.3% respectively. The necessary statistics are provided and figure.5.

Figure.5: District wise coverage of Penta 3 among children 12-23 months in KP
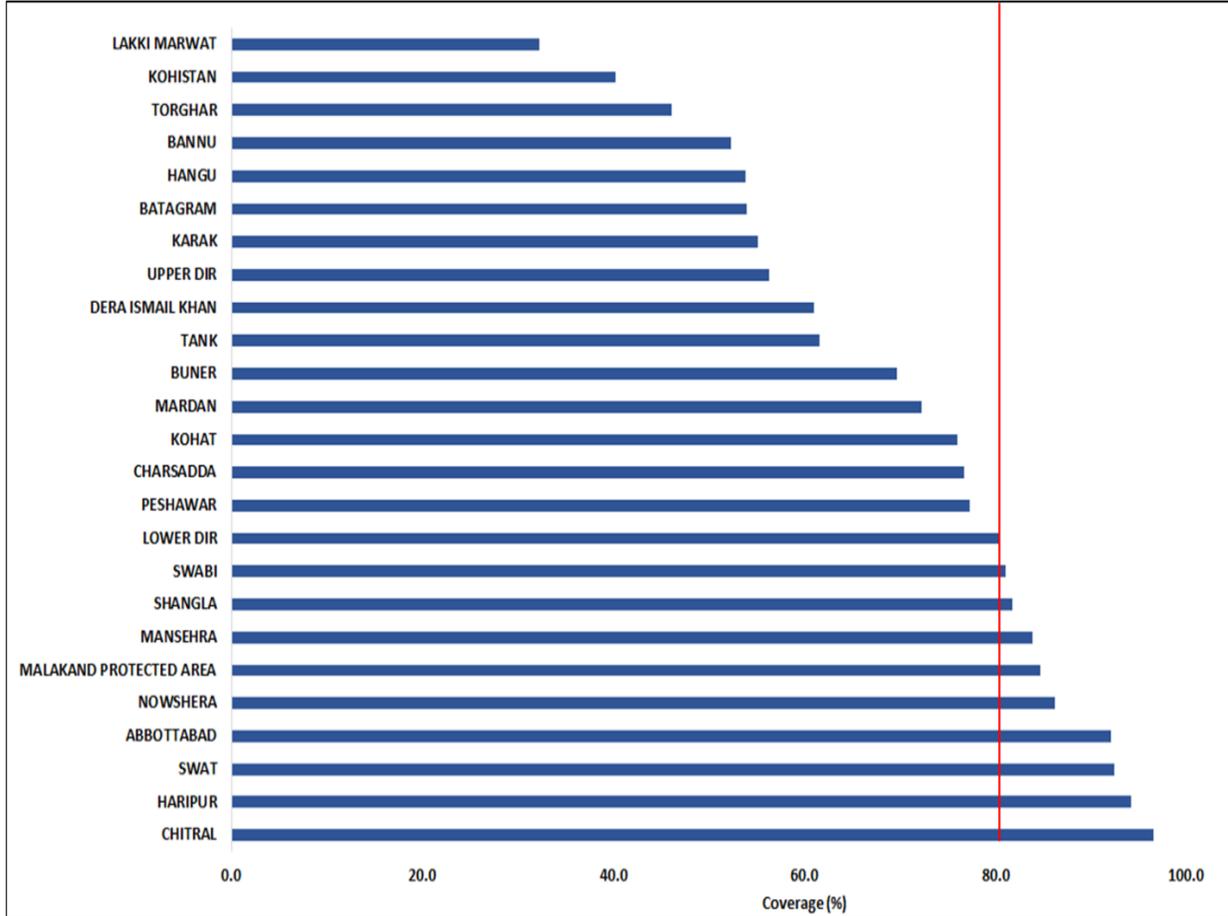
The province of Balochistan reported the lowest coverage of Penta 3 immunization in the country. Of the children surveyed in the province, 42.2% [CI: 39.7% to 44.6%] were immunized with Penta 3 doses. Only 2 out of 33 (6%) districts of the province reported at least 80% immunization coverage for Penta 3 vaccine. The lowest coverage was found in the districts of Mastung and Dera Bugti with 9.6%, and 8.8% respectively. Necessary statistics are provided in figure 6.

Figure.6: District wise coverage of Penta 3 among children 12-23 months in Balochistan
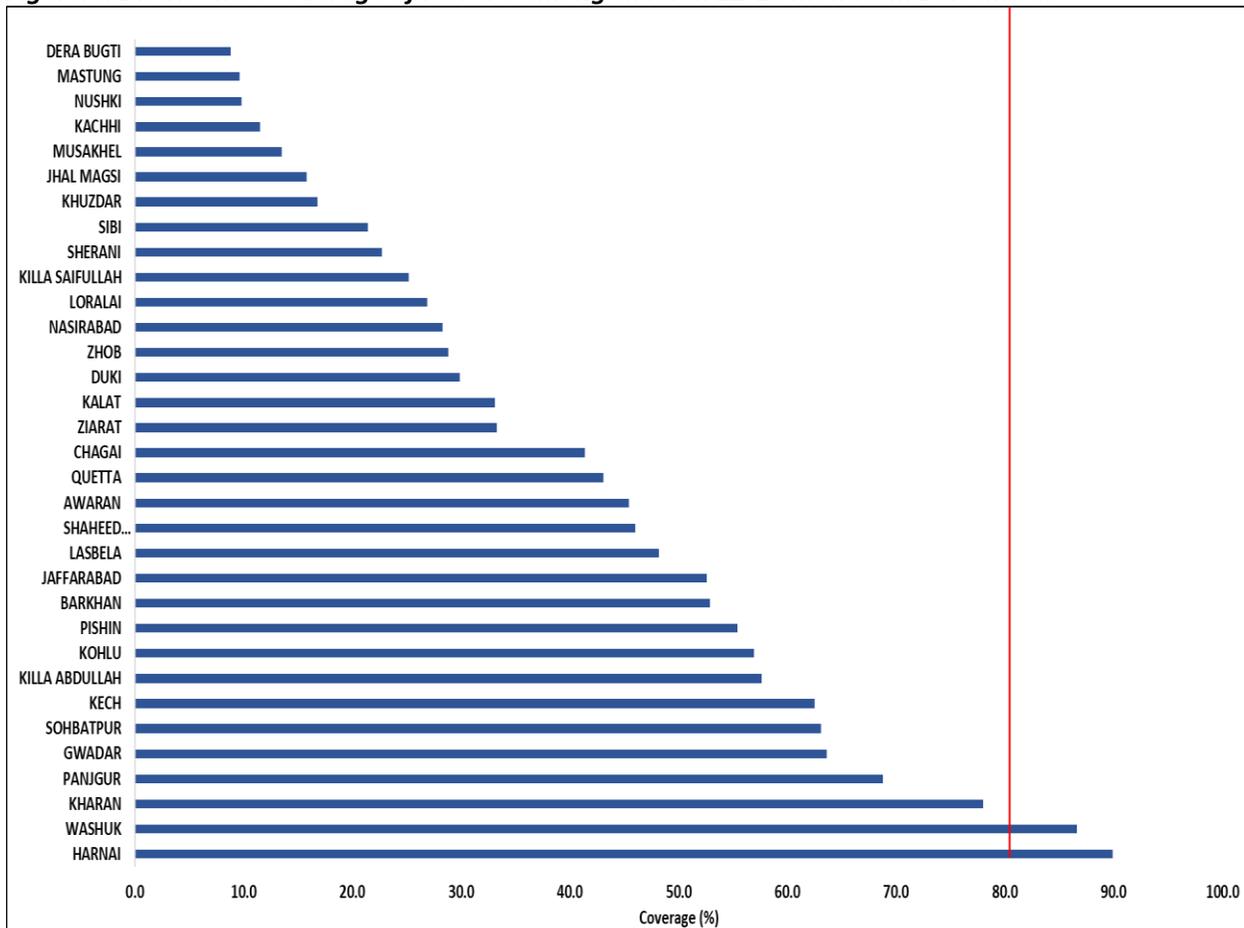
For DLI8 "Percentage of children under two years of age with vaccination cards available in each Project Province", the target of year four for provinces was 50%, 80%, 55%, 30% for Punjab, Sindh, KP, and Balochistan respectively. As reflected by the results, Punjab and KP have achieved their respective provincial targets. The provinces of Sindh and Balochistan couldn't achieve the target of DLI8.

Vaccination cards are considered a quality measure in vaccination services and one of the reliable sources of information about vaccination history. Of the children aged between 12-23 months that participated in this survey at the national level excluding AJK and GB, for 66.2% of the children, the vaccination cards were seen by the survey team at the time of the interview. Across the provinces, in Punjab, the card availability was recorded for 80.8% [CI: 79.7% to 81.9%] of the children surveyed. In KP, the vaccination card availability was recorded for 57.3% [CI: 55.7% to 58.9%] of the children, while in Sindh it was recorded for 50% [CI: 48.5% to 51.6 %] of children. The lowest vaccination card retention was found in Balochistan with only 19% [CI: 17.3% to 20.7 %] of the children retaining the card. Figure 7 provides the status of immunization card retention for each province.

Figure 7. Immunization card retention in each province
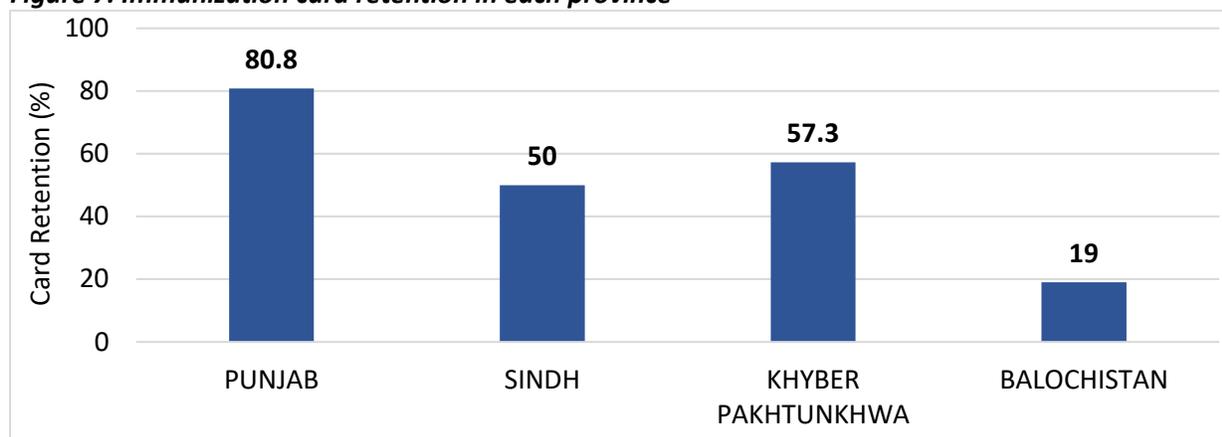
Under DLI 10 the survey assessed the coverage of fully Immunized children aged 12 to 23 months in 10 targeted urban cities in the country. Around 8,615 children were covered from these cities. Overall, in these cities, 74.5% of the children were fully immunized. The FIC among children 12 to 23 months was reported lower in urban cities than the national coverage rate of 76.4%. However, Multan, Gujranwala, Rawalpindi, Faisalabad, and Peshawar reported FIC higher than the national FIC coverage. The FIC range for the cities was recorded between 45.6 to 97.1 percent. The city-wise vaccination status is provided in figure 8.

Figure 8. Vaccination status in major urban cities
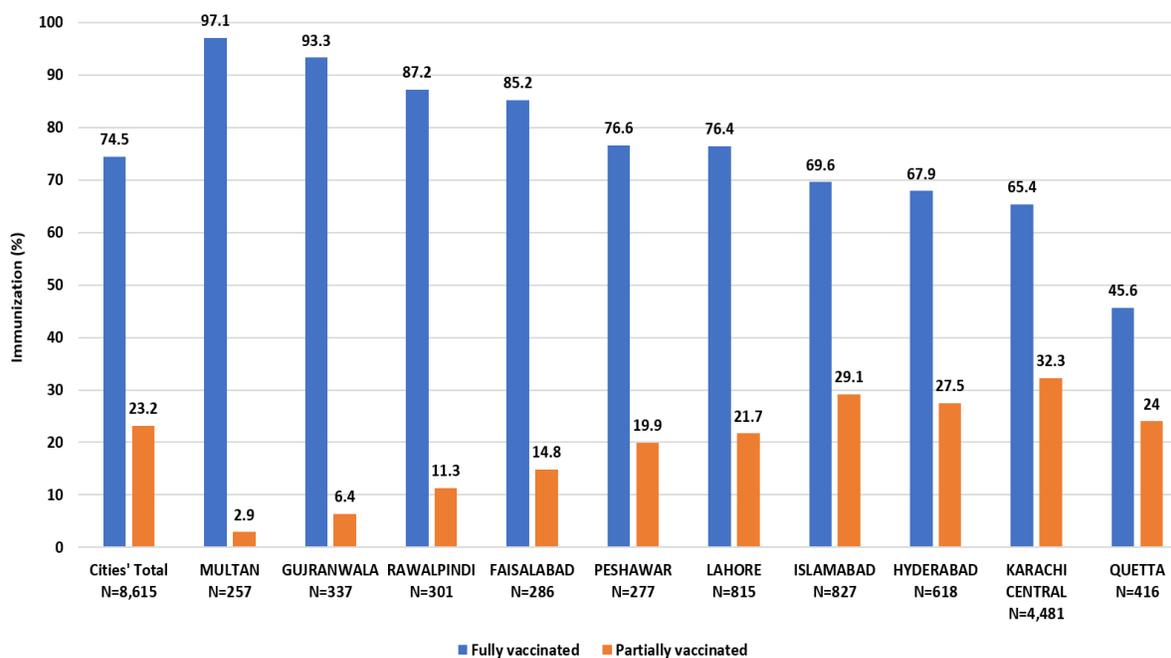
Section C: Comparison of PDHS, NNS &TPVICS Findings for Primary Objectives

This section provides a comparison of the TPVICS findings with the data reported by the Pakistan Demographic and Health Survey 2018 (PDHS) and National Nutrition Survey 2018 (NNS) about the primary objectives.

Pakistan has reportedly improved the immunization coverage over the years as per the findings from the repeated rounds of the PDHS and NNS, however, it is still far behind the optimum.

To estimate the immunization coverage among the children aged between 12-23 months, both PDHS-18 and NNS-18 relied on a small sample size as compared to TPVICS, which covered a comparatively large number of children for the assessment of the estimates. Overall, PDHS-18 and NNS-18 respectively covered 2,463, and 12, 294 children aged between 12-23 months, while TPVICS covered 110,790 children. Similarly, the sample size coverage across the provinces and regions varies greatly for PDHS-18, NNS-18, and TPVICS. In Islamabad, KP-NMD, AJK, and GB, the number of eligible children covered by both PDHS-18 and NNS-18 were in hundreds, while TPVICS covered in thousands. A more representative sample yields a more precise estimate of the indicators to get a clear picture of the population under consideration. Owing to the small sample size, the results of NNS and PDHS are not statistically powered for the reporting of immunization coverage by districts of Pakistan, but these are the only sources in the country to get an idea about the situation by province and regions.

Figure 9. Number of children aged between 12-23 covered by PDHS-18, NNS-18, and TPVICS.

	National	Punjab	Sindh	KP	Balochistan	Islamabad	KP-NMD	AJK	GB
TPVICS	110,790	24,037	23,290	17,432	25,764	1,458	5,779	7,547	5,483
PDHS-18	2,463	1,077	432	325	78	16	47	295	193
NNS-18	12,294	4526	2231	1470	1907	168	362	917	713
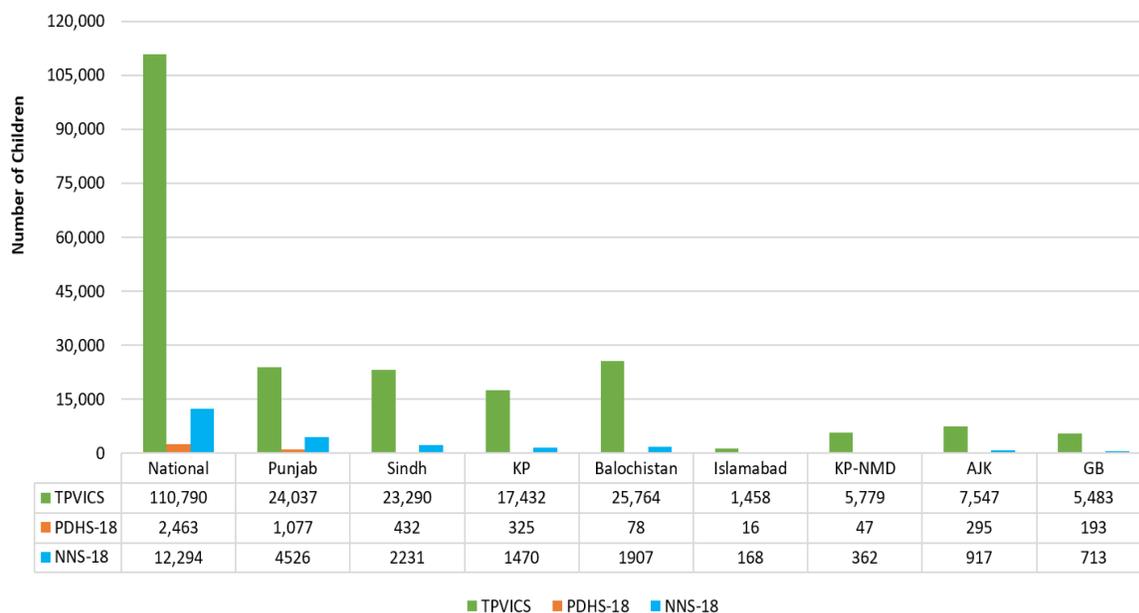
Moreover, districts level data on the coverage of routine immunization in the country was not available before the TPVICS. In absence of district-level immunization coverage data, it becomes difficult for a targeted intervention on the ground. Hence, TPVICS has addressed the shortcomings by implementing a district-specific survey in each province to provide benchmark information about the coverage of routine immunization which will be helpful for federal, provincial and district authorities to review the situation and to plan strategies for improvement. Figure 9 presents, national, region, and province-wise coverage of children aged between 12-23 months by the three surveys.

C1. Comparison of PDHS, NNS &TPVICS Findings for Fully Immunized Children Aged between 12-23 Months

The comparison of PDHS, NNS, and TPVICS findings for fully immunized children aged between 12-23 months showed that there are variations between the reported data and TPVICS assessment. At the national level (excluding AJK and GB), an improvement of 10.4% in FIC (76.4%) is witnessed as compared to PDHS-18 and NNS-18 (66%). At the provincial level, as per all surveys, Punjab came out as the best performing province, while Balochistan's achievement remained at the lowest. In the case of Punjab, the NNS and PDHS reported 80.2% and 79.9% full immunization coverage respectively, while the findings of TPVICS reflected that 88.9% of the eligible children were fully immunized in the province. A similar type of variation in the findings of the surveys was observed for the remaining provinces as well. The province-wise comparison of immunization coverage of the three surveys is provided in table 9.

Table 9. Comparison of PDHS, NNS &TPVICS findings for FIC among children aged 12-23 months of age

	NNS18		DHS18		TPVICS	
	Mean	95% CI	Mean	95% CI	Mean	95% CI
Punjab	80.3	78.7 - 81.8	79.2	74.1 - 84.2	89.9	89.0 - 90.8
Sindh	44.4	41.6 - 47.2	48.8	40.9 - 56.6	61.1	59.7 - 62.6
KP	61.8	58.1 - 65.5	54.9	44.4 - 65.5	68.4	66.7 - 70.1
Balochistan	40.0	35.6 - 44.3	28.0	19.3 - 36.7	37.6	35.1 - 40.1

C2. Comparison of PDHS, NNS &TPVICS Findings for Penta 3 Immunization Coverage among Children Aged between 12-23 Months

For the province of Punjab, NNS and PDHS respectively reported 93.8% and 89% of Penta 3 immunization coverage among the children aged between 12-23 months, while TPVICS reported the highest coverage of 94.9%. Similarly, for Sindh, TPVICS reported the highest coverage rate as compared to the NNS and PDHS findings. On the other hand, for Balochistan and KP, the NSS reported the highest coverage rates for Penta 3 immunization, and PDHS reported the lowest figures. The province-wise estimates for Penta 3 Immunization of the three surveys are presented in figure 10.

Figure 10. Comparison of PDHS, NNS &TPVICS findings for Penta 3 immunization coverage among children aged between 12-23 months.
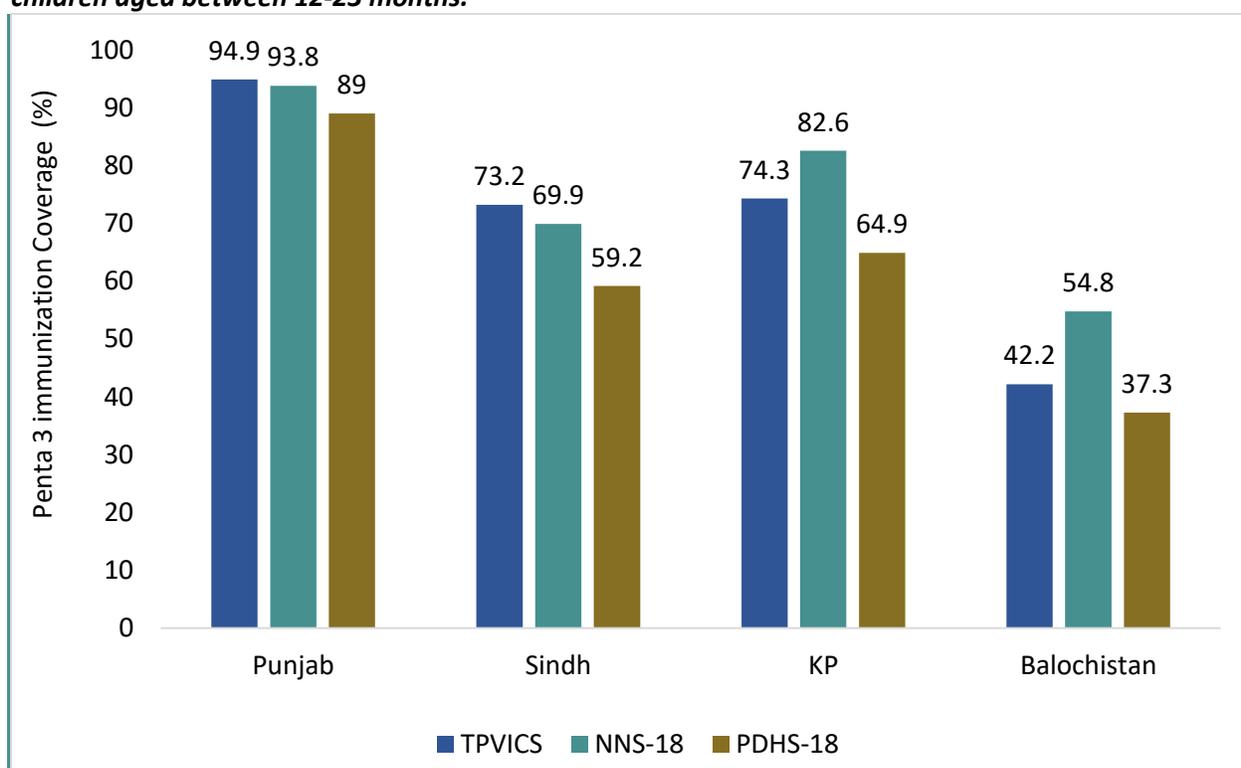
C3. Comparison of PDHS, NNS &TPVICS Findings for Percentage of Children under Two Years of Age with Vaccination Cards Available in each Province

The data variations among the findings of the national surveys and the TPVICS also exist concerning the vaccination card retention among the children of eligible age groups in each province. In Punjab, TPVICS reported the highest percentage of card retention (80.8%) as compared to 73.8%, 68% of PDHS and NNS findings, respectively. Similarly in Sindh, the highest percentage of card availability was reported by

TPVICS (50%), as compared to PDHS (49.1%), and NNS (41.8%). On the other hand, for Balochistan, the NNS reported a highest percentage of vaccination card availability (33.1%), while TPVICS reported the lowest at 19%. Similarly, the findings of the three surveys vary greatly for KP, where PDHs reported the highest percentage of card retention (60.9%) among the eligible children, while NNS and TPVICS findings showed that 55.8%, 57.3% of the eligible children were found to retain the vaccination cards.

Figure 11. Comparison of PDHS, NNS &TPVICS findings for percentage of children under two years of age with vaccination cards available in each province
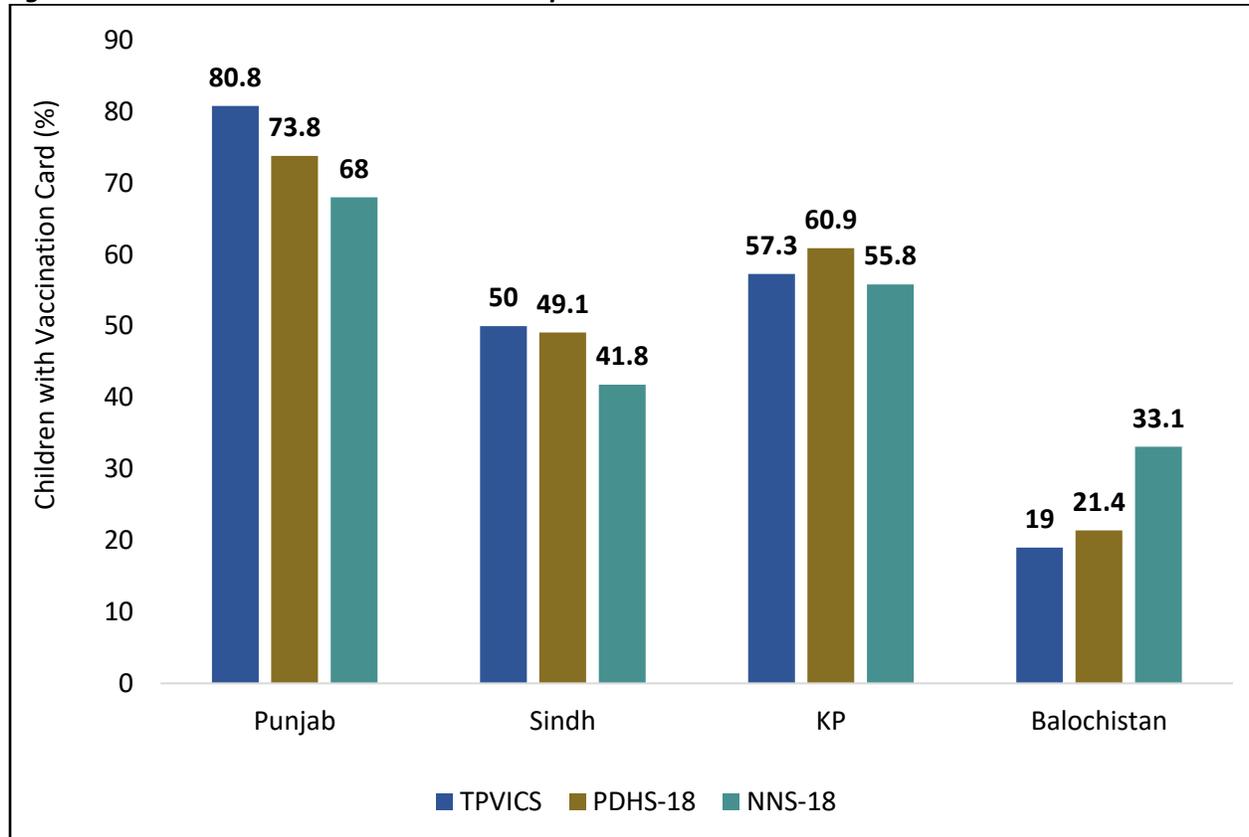
Section D: Findings of Secondary Objectives

This section presents the findings of secondary objectives, reflecting on the demographic characteristics, immunization card retention, and vaccination status at the national level, and for each project province and region.

D.1. Status of Vaccination among Children Aged 12-23 months by Characteristics at National Level

Out of 97,760 children surveyed nationally (excluding AJK and GB), 76.4% were fully vaccinated, and 17.7% were partially vaccinated, while 5.9% were not vaccinated at all. The national coverage (excluding AJK and GB), for Penta 3 and BCG immunization was recorded at 83.5%, 93.3% respectively. A higher number of male children 53,063 (54.3%) were covered by the survey as compared to the female children 44,697 (45.7%) across the country excluding AJK and GB. The FIC was recorded slightly higher among the female children (76.6%) than the male children (76.2%). Similarly, a greater number of female children were found to be immunized with BCG and Penta 3 vaccines. The Penta 3 immunization coverage was recorded at 83.5%, 83.4% for the female and the male children, respectively. Necessary statistics are provided in table 10.

At the national level excluding AJK and GB, of the children covered by the survey, a lower number 46,923 were found to retain the vaccination cards, whereas for 50,837 children that didn't have vaccination cards, their parents/caretakers recalled the history of past vaccinations during interviews. Those who possessed the cards were noted to have higher immunization coverage than those who recalled the vaccination history. 87.6% of the cardholders were fully immunized as compared to 54.5% of those who recalled the vaccination history. Similarly, a higher number (93.7%) of the cardholders were immunized with the Penta 3 vaccine as compared to 63.5% of the those who recalled the vaccination history. A similar trend was observed for BCG coverage among the two groups.

The immunization coverage and the maternal education level were found to correlate positively, across the country. The immunization coverage rapidly increased for the children with a primary level of maternal education as compared to those children whose mothers had not attended any type of formal education. Beyond the primary level of maternal education, the immunization coverage increased at a normal pace. The percentage of fully immunized children increased from 67.9% with no formal education of mothers to 87.1% with maternal education above secondary level of education. Similarly, the Penta 3 immunization increased from 75.3% to 93.7% with a higher level of maternal education. The same association was found

relevant in the case of BCG immunization coverage, where it increased from 88.4% with no maternal education to 98.8% with maternal education above secondary level of education.

The survey covered 74,969 (76.7%) children from the rural areas and 22,791 (23.3%) from the urban areas excluding AJK and GB, following the sampling frame provided by PBS. Overall, the FIC among the children of the urban area was found to be slightly higher than those of rural areas. 76.7% of the children from urban areas were fully immunized as compared to 76.2% of the children from the rural areas. The Penta 3 immunization coverage was recorded at 85.8%, 82.0% across the urban and rural divisions, respectively. Similarly, the BCG immunization among the children of urban areas was higher (96.3%) than those of the rural areas, where it was recorded at 91.4%.

Across the country, the immunization coverage increased with the wealth quintiles of the HHs. The FIC was recorded at 53.7% among the children of the poorest quintile, whereas it increased to 83.8% for the children of the richest group. Similarly, the Penta 3 and BCG coverage were also positively associated with the wealth quintiles of the HHs in the country. In the case of Penta 3 coverage, it increased from 60.7% to 91.5% across the wealth quintiles, while the BCG coverage was noted to have increased from 78.0% to 98.4% across the wealth quintiles. On the other hand, the number of unvaccinated children drastically decreased from 19.7% to 1.3% with the wealth quintiles of the respondents.

The immunization coverage across the provinces and regions of Pakistan showed that in most of the provinces and regions, the percentage of fully immunized children was recorded below 80% except for AJK and Punjab, where the FIC was recorded at 88.6%, 89.9% respectively. The Penta 3 coverage was recorded above 80% in four regions and provinces, including AJK (95.4%), GB (82.2%), Islamabad (86.3%), and Punjab (94.9%). While in the remaining three regions/provinces, the Penta 3 immunization remained below 80%. On the other hand, the BCG coverage was reported above 80% in six regions/provinces of the country except for Balochistan and KP-NMD, where it was recorded at 59.7%, 59.5% respectively. The statistics are provided in the table. 10.

D.2. Punjab

D.2.1. Demographic Characteristics

The survey covered 1,839 clusters and 36 districts in the province of Punjab. A total number of 23,763 HHs were covered against the target of 23,907 HHs. At the provincial level, the response rate was recorded at 99.4% for the HHs. And at the district level, the response rate was recorded above 90% in all the districts, while in 13 districts, a 100% response rate was observed.

A total number of 24,037 children participated in the survey from the province with a mean age of 17.5 ± 3.4 months. Out of the children surveyed in the province, more than half (52.2%) were male. And at the district level, in 30 out of 36 (83%) districts the population of male children was in majority. The statistics for wealth quintiles classification across the districts in Punjab showed that in 28 districts more than 50% of the HHs identified themselves as richest, only in district Rajanpur more than 50% of the HHs categorized themselves as poorest. The majority of the HHs in the remaining districts belonged to the middle-income quintile.

While assessing the parental education level in the districts of Punjab, it was found that in 25 districts, for the majority of the children, the mothers had obtained at least one or more years of formal education. While, in 32 districts, more than 50% of the respondents said that the fathers of the children had attended one or more years of formal education. Table 11 presents the necessary statistics.

D.2.2. Immunization Cards Retention

At the provincial level, the field teams had captured the photographs of vaccination cards for 80.8% of the respondents at the time of the interview and for 94.7% of the children, the families reported to ever have a vaccination card (table 12).

Several reasons were recorded for the non-availability of the cards in the province. The results showed that at the provincial level, 1.2% of respondents were of the view that they do not think it is important to retain a vaccination card, 0.3% said that they never visited a health facility, 0.3% mentioned that the vaccinator/ facility did not provide the card and 1% recorded that card was not available with the health provider. Only 0.2% said that they were not aware of such a card. The responses are listed in table 12.

Further, in the province, reasons for not vaccinating the children included, but not limited to, no faith in immunization, rumors about vaccines, and fear of side effects were mentioned as the major causes (table13).

D.2.3. Vaccination Status

The survey covered 24,037 children from the province of Punjab. Of the children surveyed, 89.9% were fully immunized, 9.4% were partially immunized, while 0.7% were not immunized at all. Of the total vaccinated children, 99% had received BCG dose and 94.9 % were vaccinated with Penta 3 antigen.

The survey covered 12,471 (52%) male and 11,566 (48%) female children across the province. Among the male children, 89.9% were fully immunized, 99.2% were vaccinated with BCG and 95.1 % were vaccinated with Penta 3 doses. In the case of the female children, 89.9% were fully immunized, 98.9% were vaccinated with BCG and 94.5% were vaccinated with Penta 3 doses. A small difference in immunization coverage among male and female children in the province was observed. Data is provided in table 14.

In response to the record of past vaccinations at the provincial level, 20,087 of the children surveyed, possessed vaccination cards and for 3,950 children their mothers/caretakers recalled past vaccinations. Of the cardholders, 99.9% and 97.7% were immunized with BCG and Penta 3 doses respectively, while 93.7% of them were fully immunized. For those who recall the past vaccinations, the BCG and Penta 3 immunization coverage were recorded 95.5%, 83.1% respectively and 73.8% of them were fully immunized.

A positive association between immunization coverage and maternal education level was noted at the provincial level. The percentage of fully immunized children increased from 89.1% with no formal maternal education to 91.1% coverage with maternal education higher than the 11th standard. However, a decrease in the percentage of fully immunized children was observed at the middle school education of the mothers. As reflected by the data, 90.6% of the children were fully immunized for mothers who had primary school education, and it decreased to 88.4% for mothers with middle school education. The BCG and Penta 3 immunization coverage also increased with the maternal education level. But Penta3 immunization coverage decreased among the children with maternal education above secondary level in the province.

The vaccination status among the eligible children across the rural and urban divisions showed that the FIC was higher (91.7%) among the children of the rural areas of the provinces compared to urban areas (86.7%). Similarly, the Penta 3 coverage was found higher among the children of rural areas (96%) than those of urban residents (92.9%). Similarly, the BCG coverage in the rural areas recorded 99.1%, slightly higher than that of urban areas (99%).

The survey findings revealed that the immunization coverage initially increased with wealth quintiles of

the HHs, however, a decreasing trend was observed at the highest wealth quintile. At the poorest quintile, 89.0% of the children were fully immunized whereas, it increased to 91.4% for the children belonging to the rich quintile and decreased to 89.4% for children of the richest quintile. The BCG and Penta3 Immunization coverage increased with the wealth quintiles of the HHs in the province. Furthermore, the number of children not vaccinated decreased with wealth quintile from 2.5% to 0.5% across the province.

At the district level, 34 out of 36 districts reported more than 80% fully immunization among the eligible children. The highest coverage rate was recorded in districts Mandi Bahauddin (99%) and Mianwali (99%). On the other hand, the lowest coverage was found in districts Lahore and Sheikhupura with 76.4% and 71.8% respectively. Moreover, all the districts of the province reported BCG and Penta 3 immunization coverage above 80%, while 6 districts reported 100% coverage of the BCG vaccination. The required data is present in table 14.

D.3.1. Demographic Characteristics

The survey covered 1,855 clusters in the province of Sindh spreading over 29 districts. A total number of 23,006 HHs were covered against the target of 24,128. The HHs response rate remained 95.5% at the provincial level. And at the district level, the response rates were recorded above 90% in 24 out of the 29 districts. The survey covered a total of 23,290 children with a mean age of 17.4 ± 3.5 months. Out of the children covered, a majority (52.6%) of them were male. And at the district level, in 25 districts, the population of male children was recorded in the majority (table 15).

The wealth quintiles classification across the districts of the Sindh showed that in 17 (out of 29) districts more than 50% of the HHs responded as poorest, while in 7 districts, from urban areas of the province, more than 50% of the HHs identified themselves as richest.

While assessing the parental education level in the districts of the province, it was found that the literacy remained higher among the fathers of eligible children as compared to their mothers. In 14 out of the 29 districts, more than 50% of HHs responded that the fathers of the eligible children had obtained at least one or more years of education, whereas, only in 7 districts, more than 50% of HHs responded that the mothers had obtained at least one or more years of education.

D.3.2. Immunization Card Retention

Across the province, out of the total number of children surveyed, 83.3% of the families of eligible children responded that they ever had a vaccination card. For 50% of the children, the data collection team had seen the vaccination cards at the time of the interview (table12).

The survey recorded several reasons for the non-availability of the cards in the province. At the provincial level, 3.6% of respondents were of the view that they do not think it is important to retain a vaccination card, while 2.8% said that they never visited a health facility. And the same number of the respondents mentioned that the vaccinator/ facility did not provide the card. 1.8% recorded that card was not available with the health provider. Around 2% said that they were not aware of such a card (see table 12).

Similarly, several reasons were recorded for not vaccinating the eligible children in the province. The reasons include no faith in immunization, fear of side reaction, rumors about vaccines, mother of the child was too busy, and the child was ill at the time of vaccination (table 13).

D.3.3. Vaccination Status

Of the 23,290 children aged 12-23 months who participated in this survey across Sindh, 61.1% of them were fully immunized and 31.7% were partially immunized, while 7.2% were not immunized at all. 91.9% of the children had received BCG dose at birth and 73.2% were vaccinated with Penta 3 in 14 weeks from the date of birth. The detail is provided in table 16.

The survey covered 12,138 (52%) male and 11,152 (48%) females across the province. Out of the stated numbers for each gender, 61.6% male and 60.7% female children were fully immunized. Among the male children 92.3% were vaccinated with BCG and 73.8% were vaccinated with Penta 3 doses. In the case of female children, the BCG vaccination coverage was 91.6% while that of Penta 3 was recorded at 72.6%. The FIC in the province was found to be relatively higher in male children as compared to their female counterparts.

The data collected shows that of the total children surveyed in the province, around 10,715 were found to retain the vaccination cards and for 12,575 children their mothers/caretakers recalled past vaccinations. Out of the cardholders, 99.5% and 84.8% had been immunized with BCG and Penta 3 doses respectively, while 72.5% were fully immunized. For those who recalled the past vaccinations, the BCG and Penta 3 Immunization was recorded 84.4%, 61.6% respectively and 49.8% of them were fully immunized.

The survey found a positive relationship between immunization coverage and maternal education level in the province. A more rapid improvement in the immunization coverage was observed among children whose mothers had attained a primary level of education as compared to those who had no formal education at all. The percentage of fully immunized children increased from 53.3% with no maternal education to 63.2% with primary level education and from there onwards it increased to 81.5% coverage with maternal education above secondary level. Similarly, the same trend was observed for BCG and Penta3 immunization coverage. It was also observed that with the rising maternal education level, the percentage of unvaccinated children decreased across the province.

Additionally, the assessment of immunization coverage across the urban and rural divisions in the province showed that the FIC in urban areas was higher (65.4%) as compared to that of rural residents (56.4%). Similarly, the number of unvaccinated children was found lower in the urban areas as compared to the rural areas. The BCG and Penta 3 coverage rates were also found higher among the children of urban areas as compared to those living in rural areas.

The survey findings reflect that the immunization coverage consistently increased with the wealth quintile of the HHs. At the poorest quintile, 52.3% of the children were fully immunized whereas, it increased to 71.8% for the richest quintile. The same trend of BCG and Penta 3 Immunization coverage with HHs wealth quintile was recorded in the province. The survey also recorded the number of unvaccinated children remained higher (13.9%) for the poorest segment as compared to 2% for the richest group.

At the district level, in 22 out of 29 districts, more than 50% of the children were fully immunized. District Badin (79.2%) and Tharparkar (78.9%) recorded the highest percentage of fully immunized children. While the lowest coverage was found in districts Sujawal and Kashmore with 30.3% and 19.6% respectively. The BCG coverage at the district level showed that in 26 districts the coverage remained more than 80%, only 3 districts reported to have the coverage rate less than the benchmark of 80%. In the case of Penta 3 coverage only 7 districts including, Karachi South, Khairpur, Korangi, and Karachi Central, Tharparkar, Badin and Dadu reported having more than 80% coverage. The lowest coverage of the Penta 3 was found to be in district Kashmore with 26% coverage. The statistics are provided in table.16.

D.4. Balochistan

D.4.1. Demographic Characteristics

The survey covered 2,096 clusters in 33 districts in the province of Balochistan. A total number of 25,431 HHs were covered against the target of 27,456. At the provincial level, the response rate was recorded 95.6% for the HHs. And at the district level, in 27 districts, the response rate was above 90% including 4 districts where it was recorded 100%.

A total number of 25,764 children took part in the survey with a mean age of 18.0 ± 3.1 months. Out of the children surveyed, the population of male children was in majority (57.7%). At the district level in 30 (91%) districts, the male children were found to be in the majority. The statistics for HHs wealth quintiles across the districts in Balochistan showed that in 23 (70%) districts more than 50% of the HHs identified themselves as poorest. The majority of the HHs in the remaining districts belonged to the middle-income quintile.

While assessing the parental education level in the districts of Balochistan, it was found that in none of the districts, the majority of the respondents recorded that the mothers of the eligible children were not literate. And only in one district (Washuk), more than 50% of the respondents said that the fathers of the children had attended one or more years of education. Table 17 presents the necessary statistics.

D.4.2. Immunization Card Retention

Across the province, out of the total number of children surveyed, 48.4% families of eligible children ever had a vaccination card. For 19% of the children, the data collection team had seen the vaccination cards at the time of the interview (table 12).

The survey recorded several reasons for the non-availability of the cards in the province. At the provincial level, 14% of respondents were of the view that they do not think it is important to retain a vaccination card, while 16.3% said that they never visited a health facility. 3.2% of the respondents mentioned that the vaccinator/ facility did not provide the card. 3.7% recorded that card was not available with the health provider, while 8.1% said that they were not aware of such a card (see table 12).

Similarly, several reasons were recorded for not vaccinating the eligible children in the province. The reasons include no faith in immunization, fear of side reaction, rumors about vaccines, place of immunization too far, time or place of immunization was not known, mother of the child was too busy, and the child was ill at the time of vaccination (table 13).

D.4.3. Vaccination Status

Across the province, of the children surveyed, 37.6% were fully immunized, 26.3% were partially immunized, and 36.1% were not immunized at all. Further, 59.7% of children were immunized with BCG dose and 42.2% were immunized with Penta 3 antigen.

The survey covered 15,072 (58.5%) male and 10,692 (41.5%) female children across the province. Among the male children, 37.2% were fully immunized, 59.6% were immunized with BCG and 41.6% were vaccinated with Penta3 doses. In the case of the female children, 38.2% were fully immunized. While the BCG and Penta 3 coverage remained at 59.8% and 42.9% respectively. Higher FIC was noted among the female children as compared to the male children in the province. Table 18 provides the necessary data.

In response to the record of past vaccinations, at the provincial level, for 3,523 children, the survey team had seen the vaccination cards at the time of interview and for 22,241 children, their mothers/caretakers recalled past vaccinations. Of the cardholders, 95.5% and 78.9 % were immunized with BCG and Penta 3 doses respectively, while 66.4% of them were fully immunized. For those who recall the past vaccinations, the BCG and Penta 3 immunization coverage were recorded 51.3% and 33.6% respectively and 30.9% of them were fully immunized.

Across the province, a positive relationship was noted between the immunization coverage and maternal education level. The percentage of fully immunized children increased from 35.5% with no maternal education to 66.2% coverage with maternal education higher than secondary education level. The Penta 3 immunization coverage also increased with the maternal education level from 39.9% to 71.6%. Contrary to that, BCG coverage initially decreased with rising maternal education, however, it resumed an increasing trend with maternal education from the primary education level onwards.

The vaccination status among the eligible children across the rural and urban divisions showed that the FIC was higher (48.5%) in the urban areas of the provinces compared to the rural areas (33.6%). Similarly, the Penta 3 coverage was found higher among the children of urban areas (53.8%) than those of rural residents (37.9%). Comparatively the children in the urban areas of the province were more immunized than those of the rural areas.

The survey findings revealed that the immunization coverage among the children initially increased with wealth quintiles of the HHs. However, a decreasing trend was observed at the highest wealth quintile. At the poorest quintile, 26.7% of the children were fully immunized whereas, it increased to 49.4% for the children in the rich quintile and decreased to 48.3% at the richest quintile. The same trend was noted for

Penta 3 Immunization coverage in the province. It increased from 29.8% to 54.7% with the wealth quintiles, however, decreased to 53.4% for the richest quintile. On the other hand, the BCG coverage increased from 45.8% to 79% with the wealth quintiles of the HHs.

At the district level, 2 out of 33 districts reported having more than 80% of the children fully immunized. The districts include Harnai (89.2%) and Washuk (86.5%). On the other hand, the lowest coverage was found in district Nushki and Mastung with 8.1%, 7.8% respectively. Similarly, in 2 districts (Harnai and Washuk), more than 80% of the children have immunized with Penta 3 antigen, while district Dera Bugti reported the lowest coverage of Penta3 immunization at 8.8%. For BCG coverage only 7 districts of the province reported more than 80% immunization among the target children. The required data is presented in table 18.

D.5. Khyber Pakhtunkhwa

D.5.1. Demographic Characteristics

At the provincial level, the survey covered 1,378 clusters from 25 districts of the KP province. 16,967 HHs were covered against 17,878 HHs randomized for the survey, with an overall response rate of 94.9%. At the district level, for 21 out of the 25 districts, the response rates were recorded above 90%.

A total of 17,432 children were covered by the survey in the province with a mean age of 17.8 months (SD 3.4 months). Of the children surveyed, a higher number (52.7%) of male children were covered as compared to the female children. Similarly, at the district level, in all the districts, except district Lower Dir, the male children were found to be in the majority.

The socio-economic status of the HHs across the province showed that in 2 districts (Kohistan and Toghar), the majority of the HHs were from the poorest category, while in 12 districts, the majority were from the richest segment, and in only one district (Upper Dir) majority of the HHs identified themselves as the middle-income group.

The analysis concerning parental education level in the districts of KP revealed that in 7 districts, the majority of the respondents recorded that the mothers of the children had attained one or more years of education as compared to the 20 districts, where the majority of respondent recorded that the fathers had attained one or more years of education. See table 19 for detailed statistics.

D.5.2. Immunization Card Retention

Across the province, out of the total number of children surveyed, 80.9% of the families of eligible children ever had a vaccination card. For 57.3% of the children, the data collection team had seen the vaccination cards at the time of the interview (table 12).

The survey recorded several reasons for the non-availability of the cards in the province. At the provincial level, 5.3% of respondents were of the view that they do not think it is important to retain a vaccination card, while 5.5% said that they never visited a health facility. 1.6% of the respondents mentioned that the vaccinator/ facility did not provide the card. 1.7% recorded that card was not available with the health provider, while 2% said that they were not aware of such a card (see table 12).

At the provincial level, several reasons including no faith in immunization, fear of side reaction, rumors about vaccines, family problems including mother were ill, and the child was ill at the time of vaccination

were recorded for not vaccinating the eligible children (table 13).

D.5.3. Vaccination Status

At the provincial level, in KP, 68.4% of the children were fully immunized, 20.3% were partially immunized, and 11.4% were not ever immunized. Of the children, 74.3% were immunized with Penta 3 vaccine, while 87.1% were immunized with BCG doses. A relatively higher number of male children 9,291 (53.3%) were covered by the survey as compared to female children 8,141 (46.7%) in the province.

The FIC among the male and female children recorded 68.5%, 68.2% respectively across the province. The BCG and Penta 3 coverage were found slightly higher among the male children (74.4%). 74.2% of the female children were immunized with Penta3 doses. Details are provided in table 20.

Further at the provincial level, of the children surveyed, 9,012 were found to retain the vaccination cards, while for 8,420 the mothers/caretakers recalled the vaccination history. Those who possessed the cards were noted to have a higher immunization coverage rate than those who recalled vaccination history. 82.2% of the cardholders were fully immunized as compared to 49.9% of those who were dependent on memory about past vaccinations. Similarly, the former had 88.3% Penta 3 vaccination coverage as compared to the latter (55.6%), and the same trend was reported for BCG immunization coverage for the two groups.

In the province, it was further observed that the FIC increased from 60.5% to 82.4% with a higher level of maternal education. The Penta 3 immunization also followed the same pattern and it increased from 66.8% to 87.2% with higher maternal education. The same association was found relevant in the case of BCG vaccination coverage, where it increased from 82.3% with no maternal education to 95.3% with maternal education above secondary level of education (see table 20).

Of the total children who participated in the survey, the majority 15,473 (89%) were from rural areas, whereas 1,959 (11%) belonged to the urban areas. The FIC among the children of urban areas was higher than those of rural residents across the province. 75.1% of the children from urban areas were fully immunized as compared to 66.8% of the rural children. The Penta 3 immunization coverage was recorded at 80.6%, and 72.8% across the urban and rural divisions, respectively. Similarly, the BCG immunization among the children of urban areas remained higher (91.8%) than those of rural areas (85.9%).

The survey findings depicted that the FIC among the target children consistently increased with the wealth quintiles of the HHs in the province. The percentage of fully immunized children was recorded at 40.4%

for the poorest quintile, whereas it increased to 80.8% for the richest group. Similarly, the Penta 3 and BCG coverage were also positively associated with the wealth quintiles of the HHs. In the case of Penta 3 coverage, it increased from 47.1% to 85.2% across the wealth quintiles, while the BCG coverage was noted to have increased from 68.2% to 94.7% from the poorest to the richest quintile. On the other hand, the number of children never vaccinated drastically decreased from 29.4% to 4.5% with the wealth quintiles of the respondents.

The immunization coverage at the district level reflected that in most of the districts (20 out of 25), the percentage of fully immunized children was below 80%. Only 5 districts, in the province, recorded FIC above 80%. In 12 districts of the province, more than 10% of the children were never vaccinated, with the highest percentage in district Lakki Marwat, where more than half (51.4%) of the children were never vaccinated. For Penta 3 and BCG immunization, more than 80% coverage was observed in 10 and 16 districts of the province, respectively. The data relating to the vaccination status of the province is provided in table 20.

D.6. Khyber Pakhtunkhwa Newly Merged Districts

D.6.1. Demographic Characteristics

The survey covered 467 clusters in the KP-NMD region spreading over eight districts. The HHs target was 6,071, of which 5,968 HHs were randomized and 5,665 HHs were covered with a response rate of 94.9%. A total of 5,779 children were covered by the survey in the region with a mean age of 18.2 ± 3.3 months. In all the districts of KP-NMD, except for the Bajaur agency (48.1%), the male children were in majority.

The wealth indicators for the HHs in the region showed that in 6 out of 8 districts, more than half of the HHs were from the poorest category. While in Khyber, and North Waziristan, 34.8%, 33.1%, HHs were from the middle-income group. In none of the districts, the majority of the HHs were from the richest segment.

Regarding parental education level, the survey revealed that in three districts (with the highest in South Waziristan 39.9%) for more than 20% of the children, the mothers were found to be literate. While in five districts of the region, for more than 20% of the children, the fathers were found to be literate. Necessary statistics are provided in table 21.

D.6.2. Immunization Card Retention

Across the region, out of the total number of children surveyed, 53.4% families of the eligible children ever had a vaccination card. For 40.4% of the children, the data collection team had seen the vaccination cards at the time of the interview (table 12).

The survey recorded several reasons for the non-availability of the cards in the region. At the regional level, 17.5% of respondents were of the view that they do not think it is important to retain a vaccination card, while 17% said that they never visited a health facility. 3.5% of the respondents mentioned that the vaccinator facility did not provide the card. 1.4% recorded that card was not available with the health provider, while 4% said that they were not aware of such a card (see table 12).

In the region, a number of reasons including no faith in immunization, fear of side reaction, rumors about vaccines, place of immunization too far, time or place of immunization not known, and the child was ill at the time of vaccination were recorded for not vaccinating the eligible children (table 13).

D.6.3. Vaccination Status

At the regional level in KP-NMD, 42.8% of the children were fully immunized, 20.1% were partially immunized, while 37.1% were not immunized at all. The Penta 3 and BCG immunization were reported at 49.6%, 59.5% respectively. A relatively higher number of male children 3,325 (58%) participated in the survey as compared to female children 2,454 (42%) in the region.

The FIC was found higher among the female children (44.3%) compared to the male children (41.6%) across the region. And a smaller number of female children (33.4%) were not vaccinated at all as compared to 39.9% male children. The BCG and Penta 3 coverage were found higher among female children than male children. The Penta 3 immunization coverage was recorded at 47.3%, 52.5% for the male and female children respectively as presented in table 22.

Furthermore, of the children surveyed, the vaccination card retention was observed among 2,678 children, while for 3,101 children, the mothers/caretakers recalled the vaccination history. Those who possessed the cards were noted to have a higher FIC than those who recalled vaccination history. 68.5% of the cardholders were fully immunized as compared to 25.3% of those who depended on memory about past vaccinations. Similarly, the former had 80.7% Penta 3 immunization coverage as compared to the latter (28.4%), and the same trend was recorded for BCG immunization coverage for the two groups.

Regarding the association between immunization coverage and the maternal education level, it was observed that the percentage of fully immunized children was higher for mothers with no formal education as compared to those with higher level of education. However, the coverage increased with maternal education from the secondary school level onward. Similarly, the Penta 3 and BCG immunization coverage also depicted the same trend.

In the region of KP-NMD, of the total children who participated in the survey, the majority 5,716 (99%) were from rural areas, whereas only 63 (1%) belonged to the urban areas. The FIC among the children of urban areas was found higher than those of rural residents. It was found that 56.5% of the children in urban were fully immunized as compared to 42.3% from rural areas. The Penta 3 immunization coverage was reported at 72.5%, 48.9% across the urban and rural divisions, respectively. Similarly, the BCG immunization among the children of urban areas remained higher (75.5%) than those of rural areas, where it was recorded at 59% (see table 22).

The survey findings depicted that the FIC remained consistent with the wealth quintiles of the HHs. The percentage of fully immunized children was recorded at 35.6% for the poorest quintile, whereas it increased to 76.3% for the richest group. Similarly, the Penta 3 and BCG coverage were also positively associated with the wealth quintiles of the HHs in the entire region. In the case of Penta 3 coverage, it increased from 41.6% to 79.4% across the wealth quintiles, while the BCG coverage was noted to have increased from 49.1% to 90.2% from the poorest to the richest quintile. On the other hand, the number of unvaccinated children drastically decreased from 46.1% to 7.9% with the wealth quintiles of the HHs.

The FIC at the regional level in KP-NMD reflected that none of the districts achieved 80% coverage, and in South Waziristan, it was recorded as low as 3.3% coverage. Similarly, none of the districts met the target of 80% coverage for Penta 3 immunization. The range for Penta3 immunization coverage was recorded between 4.8 to 73 percent. On the other hand, only district Khyber reported more than 80% coverage for BCG. The related data is presented in table 22.

D.7. Gilgit-Baltistan

D.7.1. Demographic Characteristics

The survey covered 433 clusters covering 10 districts in the region of GB. A total number of 5,390 HHs were covered against the target of 5,629. Overall, a 95.8% response rate was recorded in the GB region for HHs participation in the survey. At the district level, the response rate in all the districts of GB remained above 85%.

A total number of 5,483 children with mean age 17.6 ± 3.5 months were covered by the survey. Out of the children surveyed, 52.7% of them were male. At the district level, in 9 out of 10 (90%) districts, more than half of the children were male. Only in district Nagar, the population of male children was recorded at 47.8%.

The statistics for wealth quintiles across the districts of GB showed that in 6 districts more than 50% of the HHs categorized themselves as poorest, and in district Gilgit and Hunza more than 50% of the HHs identified themselves as richest. The majority of HHs in the remaining districts belonged to the middle-income quintile.

While assessing the parental education level in the districts of GB, it was found that in 5 out of 10 districts, more than 50% of respondents recorded that the mothers of the children had obtained at least one or more years of education. On the other hand, in 8 districts for more than 50% of the respondents, the fathers of the children had attained at least one year of schooling. The statistics are provided in table 23.

D.7.2. Immunization Cards Retention

In GB, overall, for 84.2% of the children, it was recorded to ever have a vaccination card. And for 52.5% of the children, the vaccination cards were seen by the survey team at the time of the interview.

The survey recorded several reasons regarding the non-availability of the vaccination cards across the region. It was found that 2.7% of the respondents said that they never visited a vaccination facility. 1.9% of the respondents informed that they were not aware of such a card, and 2% mentioned that the vaccinator/ facility did not provide the vaccination card. It was further found that 1.3% of the respondent were of the view that they don't think it is important to have a card, while 1.4% mentioned that the card was not available with the healthcare provider. Table 12 provides the necessary details.

Reasons for not vaccinating the children including the place of immunization was too far, rumors about the vaccines, unaware of the time and place of immunization, and fear of vaccines' side reactions were

recorded by the survey in the region (table 13).

D.7.3. Vaccination Status

In GB, overall, 73.3% of the children surveyed were fully immunized, 22.4% were partially immunized and 4.3% were not immunized at all. And 93.1% had received BCG doses, while 82.2% were immunized with Penta 3 vaccine.

Of the total children covered by the survey 2,865 (52.3%) male and 2,618 (47.7%) female children. Among them, 73.9% of the male and 72.5% of the female children were fully immunized. The immunization coverage for BCG and Penta 3 among the male children was 92.9% and 82.4% respectively. For the female children, the BCG and Penta 3 coverage were found at 93.3%, 81.9% respectively (see table 24).

Regarding the source of past vaccinations in the region, for 2,987 of the eligible children, the survey team had seen the vaccination cards at the time of the interview, and for 2,496 children their mothers/caretakers recalled past vaccination. Of the cardholders, 99.7% were vaccinated with BCG, 94.7% were immunized with Penta 3 doses, while 88.7% of them were fully immunized. For those who recall the past vaccination, the BCG and Penta 3 Immunization was recorded 85.9%, 68.3% respectively and around 56.2% were fully immunized.

The immunization coverage and maternal education portrayed a positive relationship in GB. The percentage of fully immunized children increased from 63.9% with no maternal education to 83.8% coverage with maternal education higher secondary level. The same trend was observed for BCG and Penta 3 immunization coverage, where the coverage for the latter increased from 72.5% to 93.4% with maternal education level.

Regarding the number of fully immunized children in urban and rural areas across GB, it was noted that the coverage in rural areas was higher (74.3%) as compared to that of urban residencies (68.4%). On the other hand, the Penta 3 coverage remained high in the urban areas, and it was recorded at 82.6% and 82.1% across urban and rural divisions, respectively. The BCG coverage in the rural and urban areas was recorded at 92.8% and 94.4% respectively.

A marginal increment in the FIC was recorded with the wealth quintiles of the HHs in the region. At the poorest quintile, 62.9% of children were fully immunized whereas, it increased to 77.3% in the richest quintile. On the other hand, a moderate increase in the case of the Penta 3 immunization was recorded. It increased from 70.8% to 87.4% from the poorest to the richest segment.

At the district level, 7 out of 10 districts reported more than 80% FIC among the target children. The lowest coverage was reported by district Diamir (35.1%) and Astore (51.2%). The BCG coverage in all districts except district Diamir was noted above 80% and it was also found that in district Hunza and Shigar the coverage was 100%. For Penta 3 immunization, 7 out of 10 districts recorded more than 80% coverage, while the lowest coverage was found in district Diamir (39.5%). Table 24 provides the statistics on vaccination status for GB.

D.8. Azad Jammu & Kashmir

D.8.1. Demographic Characteristics

In AJK, the survey covered 580 clusters stretched over 10 districts. A total number of 7,462 Households (HHs) were covered against the target of 7,540. The response rate at the regional level was recorded at 99% for the HHs coverage. At the district level, the response rate in all the districts of AJK was recorded above 95%, and, in district Neelum it was noted 100%. The survey covered a total number of 7,547 children with a mean age of 17.8 ± 3.3 months in the region. Among the children covered, the population of the male children was higher (52.6%) as compared to the female children. Similarly, at the district level, all the districts recorded a higher population of male children.

The statistics for wealth quintiles across AJK districts showed that in 7 districts, more than 50% of the HHs identified themselves as richest, only in district Haveli more than 50% of the HHs categorized themselves as poorest. The majority of the HHs in the remaining districts belonged to the middle-income quintile.

While assessing the parental education level in the districts of AJK, it was found that in 9 out of 10 districts, more than 50% of respondents recorded that the mothers had obtained at least one or more years of education. On the other hand, in all the districts of AJK, more than 50% of the respondents recorded their responses that the fathers of the children had obtained at least one or more years of education. Table 25 provides the statistics.

D.8.2. Immunization Cards Retention

Regarding vaccination card retention in the region, overall, 96.5% families of the target children recorded to have ever had a vaccination card. Further to that, at the regional level, overall, for 76.4% of the children, the vaccination cards were seen by the survey team at the time of the interview (table 12).

While responding to the question regarding the non-availability of the vaccination cards, 0.7% of the respondents said that card was not available with the health provider, while 0.5% mentioned that they had never visited a vaccination facility. 0.4% of the respondents recorded their responses as 'they don't think it is important to have a card', and 0.2% responded that the cards were not provided by the vaccinator/facility. Only 0.1% mentioned that they were not aware of such cards. The detail of the responses is presented in table 12.

Furthermore, while assessing the reasons for not vaccinating the children, the survey found that no faith in the immunization, too far place of immunization, and children's health issue at the time of vaccination.

D.8.3. Vaccination Status

In AJK, out of the total children surveyed, 88.8% were fully immunized, 10.2% were partially immunized and only 1% were found not immunized at all. While 98.9% had received BCG doses and 95.4% were immunized with Penta 3 antigen.

Around 3,944 (52%) male and 3,603 (48%) female children were covered by the survey. It was found that 89.3% of male and 88.3% of female children were fully immunized in the region. Similarly, the immunization coverage for BCG and Penta 3 among the male children was recorded at 99.2% and 96.1% respectively. For the female children, the BCG and Penta 3 coverage recorded relatively low at 98.6% and 94.7% respectively (see table 26).

The responses regarding the source of past vaccinations showed that at the regional level, for 5,802 out of the total children surveyed, the survey team had seen the vaccination cards at the time of the interview, and for 1,745 children their mothers/caretakers recalled past vaccination. Of the cardholders, 99.9% were immunized with BCG, 97.7 % were vaccinated with Penta 3 doses, while 94% of them were fully immunized. For those who recall the past vaccination, the BCG and Penta 3 Immunization was recorded 95.7%, 88% respectively and around 72.3% of them were fully immunized.

In AJK, maternal education and immunization coverage were found positively associated. The FIC increased from 79.6% with no maternal education to 93% coverage with maternal education above secondary level. The Penta 3 immunization coverage relatively increased with maternal education, however, a decline in the Penta3 coverage was observed when the maternal education level rose from primary to the middle level of education.

Furthermore, the assessment of immunization coverage in terms of urban and rural division across AJK showed that the FIC in rural areas was higher (89.6%) as compared to that of urban neighborhoods (85.3%). The BCG coverage was reported at 99%, 98.6% respectively across rural and urban divisions. While Penta 3 coverage was found higher among the children of rural areas (95.6%) as compared to those living in urban areas (94.7%).

 The survey findings reflect that the immunization coverage consistently increased with the wealth quintile of the HHs. At the poorest quintile, 69.2% of children were fully immunized whereas, it increased to 92.5% among the children in the richest quintile. The same increasing trend for BCG and Penta 3 Immunization coverage with wealth quintile was recorded in the region. For Penta 3 it increased from

84.6% to 97.8% from the poorest to the richest segment.

At the district level, in 9 out of the 10 districts, more than 80% of children were fully immunized, and the lowest coverage was recorded in district Muzaffarabad at 71% coverage. The BCG and Penta 3 coverage in all districts of AJK was recorded above 80% (see table 26).

D.9. Islamabad

D.9.1. Demographic Characteristics

In the territory of Islamabad, the survey covered 113 clusters. The HHs target was 1,469, of which 1,468 HHs were randomized and 1,439 HHs were covered with a response rate of 98%. A total of 1,458 children were covered by the survey in the region with a mean age of 17.8 months (Sd 3.4 months). Of the children covered, 48.9% were male children. Most of the HHs (89%) in the region were from the richest segment of the wealth quintiles. For parental education, the survey revealed that 82.7% of the respondents recorded that the fathers of the children had attained one or more years of education, as compared to 74.8% of the respondents who recorded that the mothers had attained one or more years of education (table 27).

D.9.2. Immunization Card Retention

In the region, out of the total number of children surveyed, for 83.5%, the families reported to have ever had a vaccination card, and for 61.7% of the children, the data collection team recorded to have seen the card at the time of the interview. Several reasons were recorded for the non-availability of the cards in the region. The results showed that a higher number of the respondents (4.2%) recorded that card was not available with the health provider. 1.7% of respondents were of the view that they do not think it is important to retain a vaccination card, 2.2% said that they were not aware of such a card. Around 0.8% said that they never visited a health facility, 0.1% mentioned that the vaccinator/ facility did not provide the card, and 7.5% mentioned other reasons for the non-availability of the vaccination cards (table 12).

D.9.3. Vaccination Status

In the region, the survey results showed that 70.8% of the children were fully immunized, 26.3% were partially immunized, and 2.9% were not ever immunized. Further, 86.3% were immunized with Penta 3 vaccine, while 96.9% were immunized with BCG doses. A relatively higher number of male children 766 (53%) were covered by the survey as compared to female children 692 (47%) in the region. The required statistics are presented in table 28.

A higher number of female children (72%) were fully immunized as compared to male children (69.4%) in the region. Similarly, a higher number of female children were immunized with the BCG and Penta 3 vaccines across the region. The Penta 3 immunization coverage was recorded at 85%, 87.5% for the male and female children, respectively.

Further, of the children surveyed, 908 were found to retain the vaccination cards, while for 550 the mothers/caretakers recalled the vaccination history. Those who possessed the cards were noted to have a higher FIC than those who recalled vaccination history. 81.2% of the cardholders were fully immunized as compared to 53.9% of those who were dependent on memory about past vaccinations. Similarly, the former had 92.2% Penta 3 vaccination coverage as compared to the latter (76.8%), and the same trend was observed for BCG immunization for the two groups.

The FIC and the maternal education level were positively associated in the region. It was observed that the percentage of fully immunized children increased from 57.1% with no maternal education to 77.3% with maternal education above secondary level. Similarly, the Penta 3 immunization increased from 67.9% to 95.6% with higher maternal education. The same association was found in the case of BCG vaccination coverage, where it increased from 91.7% with no maternal education to 99.6% with maternal education above secondary level.

Out of the total children surveyed, the majority 827 (57%) were from urban areas, whereas 631 (43%) belonged to the rural areas of the region. The FIC among the children of rural areas was found higher than those of urban residents in the region. 71.8% of the children from rural areas were fully immunized as compared to 69.6% from the urban areas. The Penta 3 immunization coverage was recorded at 86.2% for the children from rural areas as compared to 86.4% for urban areas. While the BCG immunization among the children of urban areas remained higher (98.6%) than those of the rural area (95.3%).

The immunization coverage consistently increased with the wealth quintiles of the HHs in the capital territory. The percentage of fully immunized children was recorded at 26.9% for the poorest quintile, whereas it increased to 74% for the richest group. Similarly, the Penta 3 coverage drastically increased from 48% to 90.9% across the wealth quintiles. On the other hand, the BCG coverage was recorded 100% for the poorest segments, while it decreased to 96.2% for the poor income group. Following the downturn, it increased with the wealth quintiles (see table 28).

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Table 5. District wise summary of sampled, dropped, and surveyed PSUs in provinces and regions.

PROVINCES & REGIONS	Sr.no (District)	DISTRICTS	Sampled PSUs			Dropped PSUs			After Dropped PSUs -Remaining PSUs		
			RURAL	URBAN	TOTAL	RURAL	URBAN	Total	RURAL	URBAN	TOTAL
AZAD JAMU & KASHMIR		**Total**	**509**	**71**	**580**	**0**	**0**	**0**	**509**	**71**	**580**
	1	BAGH	56	8	64				56	8	64
	2	BHIMBER	60	4	64				60	4	64
	3	HATTIAN BALA	46	3	49				46	3	49
	4	HAVELI	47	2	49				47	2	49
	5	KOTLI	59	5	64				59	5	64
	6	MIRPUR	42	22	64				42	22	64
	7	MUZAFFARABAD	56	8	64				56	8	64
	8	NEELUM	47	2	49				47	2	49
	9	POONCH	50	14	64				50	14	64
	10	SUDHNOTI	46	3	49				46	3	49
BALOCHISTAN		**Total**	**1,792**	**320**	**2,112**	**17**	**1**	**18**	**1,775**	**319**	**2,094**
	1	AWARAN	52	12	64				52	12	64
	2	BARKHAN	60	4	64				60	4	64
	3	CHAGAI	57	7	64				57	7	64
	4	DERA BUGTI	54	10	64				54	10	64
	5	DUKI	60	4	64				60	4	64
	6	GWADAR	37	27	64				37	27	64
	7	HARNAI	54	10	64				54	10	64
	8	JAFFARABAD	50	14	64				50	14	64
	9	JHAL MAGSI	62	2	64	1	0	1	61	2	63
	10	KACHHI	59	5	64				59	5	64
	11	KALAT	61	3	64	3	0	3	58	3	61
	12	KECH	51	13	64				51	13	64
	13	KHARAN	53	11	64	2	0	2	51	11	62
	14	KHUZDAR	58	6	64	2	0	2	56	6	62
	15	KILLA ABDULLAH	49	15	64				49	15	64
	16	KILLA SAIFULLAH	53	11	64	2	0	2	51	11	62
	17	KOHLU	61	3	64				61	3	64
	18	LASBELA	43	21	64	0	1	1	43	20	63
	19	LORALAI	52	12	64				52	12	64
	20	MASTUNG	59	5	64				59	5	64
	21	MUSAKHEL	53	11	64				53	11	64

	22	NASIRABAD	51	13	64				51	13	64
	23	NUSHKI	53	11	64				53	11	64
	24	PANJGUR	58	6	64				58	6	64
	25	PISHIN	56	8	64	1	0	1	55	8	63
	26	QUETTA	31	33	64				31	33	64
	27	SHAHEED SIKANDAR ABAD	60	4	64				60	4	64
	28	SHERANI	64		64				64		64
	29	SIBI	51	13	64				51	13	64
	30	SOHBATPUR	59	5	64				59	5	64
	31	WASHUK	58	6	64				58	6	64
	32	ZHOB	51	13	64				51	13	64
	33	ZIARAT	62	2	64	6	0	6	56	2	58
		Total	**382**	**51**	**433**	**0**	**0**	**0**	**382**	**51**	**433**
GILGIT-BALTISTAN	1	ASTORE	21		21				21		21
	2	BALTISTAN	50	14	64				50	14	64
	3	DIAMIR	40	3	43				40	3	43
	4	GHANCHE	44	5	49				44	5	49
	5	GHIZER	59	5	64				59	5	64
	6	GILGIT	40	24	64				40	24	64
	7	HUNZA	32		32				32		32
	8	KHARMANG	32		32				32		32
	9	NAGAR	32		32				32		32
	10	SHIGAR	32		32				32		32
ISLAMABAD		**Total**	**49**	**64**	**113**	**0**	**0**	**0**	**49**	**64**	**113**
	1	ISLAMABAD	49	64	113				49	64	113
		Total	**1,693**	**160**	**1,853**	**8**	**0**	**8**	**1,685**	**160**	**1,845**
KHYBER PAKHTUNKHUWA	1	ABBOTTABAD	41	8	49				41	8	49
	2	BAJAUR	64		64				64		64
	3	BANNU	61	3	64				61	3	64
	4	BATAGRAM	64		64	8	0	8	56	0	56
	5	BUNER	49		49				49		49
	6	CHARSADDA	55	9	64				55	9	64
	7	CHITRAL	59	5	64				59	5	64
	8	DERA ISMAIL KHAN	50	14	64				50	14	64
	9	HANGU	50	14	64				50	14	64
	10	HARIPUR	44	5	49				44	5	49
	11	KARAK	61	3	64				61	3	64
	12	KHYBER	62	2	64				62	2	64

13	KOHAT	39	10	49				39	10	49
14	KOHISTAN	64		64				64		64
15	KURRAM	62	2	64				62	2	64
16	LAKKI MARWAT	59	5	64				59	5	64
17	LOWER DIR	48	1	49				48	1	49
18	MALAKAND PROTECTED AREA	45	4	49				45	4	49
19	MANSEHRA	45	4	49				45	4	49
20	MARDAN	41	8	49				41	8	49
21	MOHMAND	64		64				64		64
22	NORTH WAZIRISTAN	63	1	64				63	1	64
23	NOWSHERA	39	10	49				39	10	49
24	ORAKZAI	64		64				64		64
25	PESHAWAR	28	21	49				28	21	49
26	SHANGLA	64		64				64		64
27	SOUTH WAZIRISTAN	64		64				64		64
28	SWABI	42	7	49				42	7	49
29	SWAT	33	16	49				33	16	49
30	TANK	58	6	64				58	6	64
31	TORGHAR	64		64				64		64
32	UPPER DIR	47	2	49				47	2	49
PUNJAB	**Total**	**1,382**	**457**	**1,839**	**0**	**0**	**0**	**1,382**	**457**	**1,839**
	1	ATTOCK	38	11	49				38	11	49
	2	BAHAWALNAGAR	40	9	49				40	9	49
	3	BAHAWALPUR	37	12	49				37	12	49
	4	BHAKKAR	43	6	49				43	6	49
	5	CHAKWAL	42	7	49				42	7	49
	6	CHINIOT	37	12	49				37	12	49
	7	DERA GHAZI KHAN	54	10	64				54	10	64
	8	FAISALABAD	27	22	49				27	22	49
	9	GUJRANWALA	24	25	49				24	25	49
	10	GUJRAT	37	12	49				37	12	49
	11	HAFIZABAD	36	13	49				36	13	49
	12	JHANG	39	10	49				39	10	49
	13	JHELUM	39	10	49				39	10	49
	14	KASUR	50	14	64				50	14	64
	15	KHANEWAL	39	10	49				39	10	49
	16	KHUSHAB	39	10	49				39	10	49
	17	LAHORE		64	64					64	64

18	LAYYAH	40	9	49				40	9	49
19	LODHRAN	42	7	49				42	7	49
20	MANDI BAHAUDDIN	40	9	49				40	9	49
21	MIANWALI	39	10	49				39	10	49
22	MULTAN	29	20	49				29	20	49
23	MUZAFFARGARH	41	8	49				41	8	49
24	NANKANA SAHIB	54	10	64				54	10	64
25	NAROWAL	44	5	49				44	5	49
26	OKARA	38	11	49				38	11	49
27	PAKPATTAN	42	7	49				42	7	49
28	RAHIM YAR KHAN	40	9	49				40	9	49
29	RAJANPUR	54	10	64				54	10	64
30	RAWALPINDI	26	23	49				26	23	49
31	SAHIWAL	40	9	49				40	9	49
32	SARGODHA	37	12	49				37	12	49
33	SHEIKHUPURA	35	14	49				35	14	49
34	SIALKOT	38	11	49				38	11	49
35	TOBA TEK SINGH	41	8	49				41	8	49
36	VEHARI	41	8	49				41	8	49
	Total	**1,055**	**801**	**1,856**	**1**	**0**	**1**	**1,054**	**801**	**1,855**
1	BADIN	46	18	64				46	18	64
2	DADU	46	18	64				46	18	64
3	GHOTKI	51	13	64				51	13	64
4	HYDERABAD	9	55	64				9	55	64
5	JACOBABAD	46	18	64				46	18	64
6	JAMSHORO	39	25	64				39	25	64
7	KAMBAR SHAHDAD KOT	41	23	64				41	23	64
8	KARACHI CENTRAL		64	64					64	64
9	KARACHI EAST		64	64					64	64
10	KARACHI SOUTH		64	64					64	64
11	KARACHI WEST	6	58	64				6	58	64
12	KASHMORE	43	21	64				43	21	64
13	KHAIRPUR	43	21	64				43	21	64
14	KORANGI		64	64					64	64
15	LARKANA	36	28	64				36	28	64
16	MALIR	31	33	64				31	33	64
17	MATIARI	49	15	64				49	15	64
18	MIRPUR KHAS	44	20	64				44	20	64

SINDH

19	NAUSHAHRO FEROZE	49	15	64				49	15	64
20	SANGHAR	44	20	64				44	20	64
21	SHAHEED BENAZIRABAD	46	18	64				46	18	64
22	SHIKARPUR	45	19	64				45	19	64
23	SUJAWAL	57	7	64				57	7	64
24	SUKKUR	31	33	64				31	33	64
25	TANDO ALLAHYAR	44	20	64				44	20	64
26	TANDO MUHAMMAD KHAN	51	13	64				51	13	64
27	THARPARKAR	57	7	64				57	7	64
28	THATTA	51	13	64	1	0	1	50	13	63
29	UMER KOT	50	14	64				50	14	64
GRAND TOTAL		**6,862**	**1,924**	**8,786**	**26**	**1**	**27**	**6,836**	**1,923**	**8,759**

Table 6. Basic characteristics of national demography

Level	Clusters			Households					Children 12-23 months			Wealth Quintiles			% literate[1]	
	Sampled	Randomized	Surveyed	Target	Randomized	Completed	Response Rate (%)	Household size (mean ± sd)	N	Age in months (mean ± sd)	% male children	Too Poorest	Middle	Too Richest	Mothers	Fathers
Pakistan	**8,786**	**8,759**	**8,759**	**114,218**	**113,057**	**109,123**	**96.5**	**6.9 ± 3.7**	**110,790**	**17.6 ± 3.4**	**54.04**				**52.1**	**62.6**
KHYBER PAKHTUNKHWA	1386	1378	1378	18018	17878	16967	94.9	8.6 ± 5.1	17432	17.8 ± 3.4	52.7	19.2	25.9	54.9	42.4	62.4
PUNJAB	1839	1839	1839	23907	23898	23763	99.4	6.7 ± 3.3	24037	17.5 ± 3.4	52.2	12.9	16.7	70.4	62.1	69.3
SINDH	1856	1855	1855	24128	24086	23006	95.5	6.1 ± 3.0	23290	17.4 ± 3.5	52.6	36.8	12.6	50.6	41.5	55.3
BALOCHISTAN	2112	2094	2094	27456	26591	25431	95.6	8.4 ± 5.2	25764	18.0 ± 3.1	57.7	59.9	21.6	18.5	16.6	21.7
ISLAMABAD	113	113	113	1469	1468	1439	98.0	6.8 ± 3.0	1458	17.8 ± 3.4	48.9	5.1	5.9	89.0	74.8	82.7
GILGIT-BALTISTAN	433	433	433	5629	5628	5390	95.8	9.9 ± 5.2	5483	17.6 ± 3.5	52.7	44.7	28.3	27.0	55.5	70.9
AZAD JAMMU & KASHMIR	580	580	580	7540	7540	7462	99.0	7.4 ± 3.5	7547	17.8 ± 3.3	52.6	14.3	22.7	63.0	79.9	88.6
KP-NMD/FATA	467	467	467	6071	5968	5665	94.9	9.9 ± 6.2	5779	18.2 ± 3.3	56.6	65.1	23.0	12.0	16.9	30.6

[1] 1 or more years of education

Table 10. Vaccination status for 12-23 months children by characteristics – National

	Birth		6 weeks				10 weeks				14 weeks				9 months	Fully vaccinated[1]	Partially vaccinated	Not vaccinated	Total children
	BCG	OPV0	OPV 1	Penta 1	PCV 1	RV 1	OPV 2	Penta 2	PCV 2	RV 2	OPV 3	Penta 3	PCV 3	IPV	MCV 1				
Total[2]	**93.3**	**92.5**	**91.3**	**90.4**	**90.1**	**89.4**	**88.0**	**87.4**	**87.0**	**85.3**	**84.1**	**83.5**	**82.8**	**84.2**	**80.4**	**76.4**	**17.7**	**5.9**	**97,760**
Sex of Child																			
Male	93.2	92.3	91.2	90.4	90.0	89.2	88.0	87.4	86.9	85.3	84.0	83.4	82.8	84.2	80.2	76.2	17.7	6.1	53,063
Female	93.4	92.6	91.4	90.5	90.3	89.5	88.0	87.3	87.0	85.4	84.3	83.5	82.7	84.3	80.6	76.6	17.6	5.8	44,697
Source																			
Card	99.5	99.2	98.8	98.8	98.7	98.1	96.4	96.3	96.3	95.7	93.8	93.7	93.7	93.5	89.4	87.6	12.3	0.1	46,923
Recall	81.0	79.2	76.6	74.1	73.3	72.1	71.5	69.8	68.8	65.1	65.1	63.5	61.4	66.1	62.7	54.5	28.1	17.4	50,837
Maternal years of education																			
None	88.4	87.3	85.7	84.2	83.8	83.0	81.2	80.0	79.5	77.5	76.5	75.3	74.4	76.4	72.4	67.9	21.7	10.4	62,737
Primary (1-5)	96.9	96.2	95.3	94.9	94.6	94.0	92.9	92.5	92.2	91.0	90.2	89.2	88.9	89.9	86.3	83.3	14.2	2.5	9,594
Middle (6-8)	96.8	96.2	95.3	95.1	94.8	93.8	92.6	92.4	92.0	90.6	89.4	89.1	88.4	89.2	85.5	81.3	16.1	2.6	5,665
Secondary (9-10)	98.1	97.5	96.7	96.5	96.3	95.4	94.5	94.5	94.2	93.0	91.0	91.3	90.5	91.5	87.3	83.8	14.5	1.6	9,381
Higher (11 and above)	98.8	98.6	98.1	98.0	97.7	97.0	96.5	96.6	96.3	94.9	93.4	93.7	93.1	94.1	91.1	87.1	12.0	0.9	10,383
Residence																			
Rural	91.4	90.5	89.4	88.5	88.2	87.6	86.3	85.6	85.2	83.6	82.8	82.0	81.5	83.0	79.8	76.2	16.2	7.7	74,969
Urban	96.3	95.5	94.3	93.6	93.3	92.3	90.8	90.2	89.9	88.3	86.3	85.8	84.9	86.2	81.3	76.7	20.2	3.1	22,791
Wealth Quintiles																			
Poorest	78.0	77.1	74.0	71.5	71.0	70.0	68.3	66.3	65.8	63.8	63.0	60.7	59.9	62.3	58.4	53.7	26.6	19.7	20,993
Poor	86.4	85.4	84.0	82.1	81.7	81.0	79.3	77.7	77.2	75.2	74.2	72.6	71.6	73.8	70.4	65.4	22.6	12.0	19,234
Middle	92.2	91.3	90.4	89.4	89.1	88.4	86.9	86.1	85.6	83.8	83.2	82.2	81.5	83.1	79.2	75.4	17.8	6.8	18,739
Rich	96.3	95.5	94.6	93.9	93.7	93.0	91.6	91.1	90.8	89.1	88.0	87.5	87.1	88.2	84.7	81.3	15.5	3.3	18,363
Richest	98.4	97.7	96.9	96.8	96.6	95.7	94.7	94.7	94.4	93.1	91.4	91.5	90.7	91.8	87.8	83.8	14.8	1.3	20,431
Provinces & Regions																			
KHYBER PAKHTUNKHWA	87.1	85.9	84.8	83.8	83.3	82.5	80.2	79.6	79.1	77.7	75.2	74.3	73.7	75.9	73.1	68.4	20.3	11.4	17,432
PUNJAB	99.0	98.5	98.3	98.2	98.0	97.4	97.2	97.1	96.8	95.6	94.9	94.9	94.5	95.4	92.5	89.9	9.4	0.7	24,037
SINDH	91.9	90.9	87.7	85.9	85.5	84.3	81.2	79.6	79.1	76.2	74.9	73.2	71.5	73.7	67.1	61.1	31.7	7.2	23,290
BALOCHISTAN	59.7	58.0	55.5	52.3	51.9	51.5	50.6	47.6	47.3	46.4	45.1	42.2	42.0	44.7	42.6	37.6	26.3	36.1	25,764
ISLAMABAD	96.9	96.0	94.5	94.0	93.8	92.6	85.5	92.2	91.8	90.8	80.4	86.3	86.2	88.1	81.7	70.8	26.3	2.9	1,458
GILGIT-BALTISTAN	93.1	93.8	94.0	89.7	89.2	85.7	89.9	86.8	86.3	81.7	84.6	82.2	81.1	83.7	81.2	73.3	22.4	4.3	5,483
AZAD JAMMU & KASHMIR	98.9	98.8	98.7	98.6	98.6	98.1	97.6	97.9	97.9	97.4	93.0	95.4	95.6	95.9	93.2	88.8	10.2	1.0	7,547
KP-NMD/FATA	59.5	58.3	59.5	58.9	58.3	58.4	54.9	53.7	53.5	53.4	51.0	49.6	49.5	51.3	49.4	42.8	20.1	37.1	5,779
[1] All vaccines from birth to 9 months (excluding RV)																			
[2] Excludes AJK and GB																			

Table 11. Demographic characteristics - Punjab

| Level | Clusters Sampled | Households | | | | | Children 12-23 months | | | Wealth Quintiles | | | % literate[1] | |
		Target	Randomized	Completed	Response rate	Household size, mean ± sd	N	Age in months (mean ± sd)	% male children	Too Poorest	Middle	Too Richest	Mothers	Fathers
PUNJAB	**1,839**	**23,907**	**23,898**	**23,763**	**99.4**	**6.7 ± 3.3**	**24,037**	**17.5 ± 3.4**	**52.2**	**12.9**	**16.7**	**70.4**	**62.1**	**69.3**
ATTOCK	49	637	637	631	99.1	6.6 ± 3.3	633	17.9 ± 3.5	54.7	7.5	11.7	80.8	71.4	82.1
RAWALPINDI	49	637	637	635	99.7	6.6 ± 2.6	637	17.5 ± 3.5	50.5	1.7	8.4	90.0	87.9	90.9
JHELUM	49	637	637	636	99.8	7.1 ± 3.1	653	17.9 ± 3.6	54.9	4.0	6.1	89.9	91.4	92.5
CHAKWAL	49	637	637	624	98.0	6.7 ± 3.6	629	17.6 ± 3.3	49.6	4.3	9.2	86.5	82.9	85.1
SARGODHA	49	637	637	629	98.7	7.2 ± 3.8	637	17.9 ± 3.6	52.9	11.9	15.8	72.3	63.6	78.5
BHAKKAR	49	637	636	636	100.0	5.5 ± 2.7	643	17.6 ± 3.4	54.9	41.5	24.2	34.3	38.3	51.5
KHUSHAB	49	637	637	636	99.8	5.9 ± 2.6	641	17.9 ± 3.4	52.1	17.7	22.0	60.3	63.0	77.3
MIANWALI	49	637	637	635	99.7	6.7 ± 2.8	639	18.2 ± 3.5	47.7	5.0	20.9	74.2	67.7	82.9
FAISALABAD	49	637	637	626	98.3	7.1 ± 3.4	641	17.4 ± 3.6	52.5	11.7	16.6	71.7	70.0	72.5
CHINIOT	49	637	637	633	99.4	6.6 ± 3.2	635	17.4 ± 3.5	51.7	17.1	22.0	60.9	42.9	61.1
JHANG	49	637	637	637	100.0	5.4 ± 2.1	638	17.2 ± 3.4	51.6	21.9	29.4	48.7	37.1	51.6
TOBA TEK SINGH	49	637	637	634	99.5	6.0 ± 2.5	638	17.7 ± 3.5	51.7	6.7	18.4	74.9	66.0	77.4
GUJRANWALA	49	637	637	637	100.0	7.7 ± 3.7	657	17.7 ± 3.6	53.0	0.9	5.5	93.6	80.6	80.0
HAFIZABAD	49	637	632	629	99.5	7.6 ± 3.8	638	17.8 ± 3.6	51.3	6.1	12.2	81.7	66.1	74.4
GUJRAT	49	637	637	637	100.0	7.6 ± 4.1	652	17.6 ± 3.6	50.7	6.1	3.0	90.8	86.2	85.8
MANDI BAHAUDDIN	49	637	637	636	99.8	7.4 ± 3.6	646	17.4 ± 3.5	51.8	5.3	8.3	86.4	79.3	80.7
SIALKOT	49	637	637	608	95.4	8.2 ± 3.9	622	17.7 ± 3.6	49.7	0.6	2.5	96.9	88.7	88.1
NAROWAL	49	637	637	634	99.5	8.4 ± 4.3	653	17.5 ± 3.5	51.0	2.7	6.5	90.8	82.0	87.2
LAHORE	64	832	832	810	97.4	6.4 ± 3.0	815	17.3 ± 3.3	55.6	0.7	3.4	95.9	85.0	85.5
KASUR	64	832	832	832	100.0	7.3 ± 3.8	847	17.6 ± 3.5	51.6	2.8	18.1	79.1	65.1	75.5
SHEIKHUPURA	49	637	637	631	99.1	7.0 ± 3.7	641	16.9 ± 3.3	49.5	2.2	11.4	86.3	74.2	76.1
NANKANA SAHIB	64	832	831	830	99.9	6.5 ± 2.9	836	17.4 ± 3.5	53.3	6.6	17.2	76.2	75.3	82.5
OKARA	49	637	637	637	100.0	6.0 ± 2.7	637	17.4 ± 3.3	54.9	7.9	26.5	65.6	50.2	58.7
SAHIWAL	49	637	637	637	100.0	5.7 ± 3.4	644	17.4 ± 3.3	51.1	3.9	16.5	79.6	70.5	78.1
PAKPATTAN	49	637	637	637	100.0	6.3 ± 2.0	637	17.0 ± 3.2	51.1	6.4	29.9	63.7	46.8	56.3
VEHARI	49	637	637	636	99.8	6.4 ± 2.8	637	17.1 ± 3.2	54.1	14.4	26.0	59.6	57.3	64.9
MULTAN	49	637	635	631	99.4	7.7 ± 3.7	637	17.1 ± 3.3	53.1	15.1	20.1	64.8	58.5	65.2
LODHRAN	49	637	637	637	100.0	6.0 ± 2.8	648	17.7 ± 3.5	52.2	27.6	23.4	49.0	36.0	48.4
KHANEWAL	49	637	637	637	100.0	6.2 ± 3.1	642	17.1 ± 3.4	49.6	14.0	24.5	61.5	52.0	62.4
DERA GHAZI KHAN	64	832	832	831	99.9	5.6 ± 2.8	839	17.4 ± 3.3	56.5	26.1	23.6	50.4	27.1	37.2

RAJANPUR	64	832	832	824	99.0	7.0 ± 3.6	829	17.4 ± 3.5	51.9	61.5	15.3	23.2	20.4	33.7
LAYYAH	49	637	637	637	100.0	6.0 ± 2.8	642	17.4 ± 3.3	50.2	24.3	34.2	41.6	51.9	64.6
MUZAFFARGARH	49	637	637	635	99.7	5.6 ± 1.9	640	17.4 ± 3.2	51.5	22.8	27.4	49.8	29.6	42.9
BAHAWALPUR	49	637	637	637	100.0	6.7 ± 3.1	642	17.7 ± 3.5	50.7	30.3	22.9	46.9	40.6	50.0
BAHAWALNAGAR	49	637	637	637	100.0	6.2 ± 3.2	646	17.5 ± 3.5	51.4	24.7	21.1	54.3	49.1	56.7
RAHIM YAR KHAN	49	637	637	634	99.5	7.4 ± 3.8	646	17.8 ± 3.5	49.7	30.5	24.1	45.4	42.2	54.4

[1] 1 or more years of education

Table 12. Card retention – National, provinces and regions

Level	12-23 months children	Ever had a card	Reasons for not availability of cards						Card Retention (seen at the time of interview)
			Don't think it is important	Never Visited a facility	Card not available at with the health provider	Vaccinator/ facility did not provide the card	Not aware of such card	Other	
PAKISTAN	**110,790**								**66.2**[1]
KHYBER PAKHTUNKHWA	17,432	80.9	5.3	5.5	1.7	1.6	2.0	3.1	57.3
PUNJAB	24,037	94.7	1.2	0.3	1.0	0.3	0.2	2.4	80.8
SINDH	23,290	83.3	3.6	2.8	1.8	2.8	2.0	3.7	50.0
BALOCHISTAN	25,764	48.4	14.0	16.3	3.7	3.2	8.1	6.3	19.0
ISLAMABAD	1,458	83.5	1.7	0.8	4.2	0.1	2.2	7.5	61.7
GILGIT-BALTISTAN	5,483	84.2	1.3	2.7	1.4	2.0	1.9	6.5	52.5
AZAD JAMMU & KASHMIR	7,547	96.5	0.4	0.5	0.7	0.2	0.1	1.6	76.4
FATA	5,779	53.4	17.5	17.0	1.4	3.5	4.0	3.2	40.4

[1] Excludes AJK and GB.

Table 13. Reasons for not vaccinating children in provinces and regions

Reasons	Provinces and Regions							
	KHYBER PAKHTUNKHWA	PUNJAB	SINDH	BALOCHISTAN	ISLAMABAD	GILGIT-BALTISTAN	AZAD JAMMU & KASHMIR	KP-NMD
Place of immunization too far	1.7	0.1	1.4	6.5	0.0	0.5	0.2	8.4
Time of immunization not convenient	0.4	0.0	0.2	1.3	0.0	0.0	0.0	1.9
Mother too busy	0.7	0.1	0.7	2.9	0.0	0.1	0.1	0.6
Family problem including mother ill	1.1	0.0	0.4	1.5	0.1	0.2	0.1	1.9
Child ill, not brought	1.0	0.0	0.7	1.8	0.1	0.2	0.1	1.5
Child ill, brought but not vaccinated	0.2	0.0	0.2	0.7	0.0	0.0	0.0	0.2
Long wait	0.2	0.0	0.2	0.9	0.0	0.1	0.1	0.2
Rumors	3.9	0.2	1.6	8.6	0.4	0.5	0.0	11.2
No faith in immunization	3.6	0.2	2.6	5.2	1.8	1.3	0.3	10.1
Fear of side reaction	1.1	0.1	1.0	3.1	0.0	0.2	0.1	2.8
Time or Place of immunization not Known	0.5	0.0	0.4	3.6	0.2	0.1	0.0	1.3
Took child but no vaccine available	0.0	0.0	0.1	0.3	0.1	0.1	0.0	0.1
Took child but no vaccinator	0.1	0.0	0.0	0.5	0.1	0.0	0.0	0.2
Took child facility closed	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.2
Child was sick	0.5	0.0	0.3	2.6	0.0	0.2	0.1	0.4
Took child but not vaccination day	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.1
Other (specify)	0.7	0.2	0.9	2.1	0.5	0.9	0.1	0.4

Table 14. Vaccination status- Punjab

	Birth		6 weeks				10 weeks				14 weeks				9 months	Fully vaccinated[1]	Partially vaccinated	Not vaccinated	Total children
	BCG	OPV0	OPV 1	Penta 1	PCV 1	RV 1	OPV 2	Penta 2	PCV 2	RV 2	OPV 3	Penta 3	PCV 3	IPV	MCV 1				
PUNJAB	**99.0**	**98.5**	**98.3**	**98.2**	**98.0**	**97.4**	**97.2**	**97.1**	**96.8**	**95.6**	**94.9**	**94.9**	**94.5**	**95.4**	**92.5**	**89.9**	**9.4**	**0.7**	**24,037**
Sex of Child																			
Male	99.2	98.7	98.5	98.3	98.0	97.5	97.4	97.4	96.9	95.7	95.1	95.1	94.9	95.6	92.5	89.9	9.5	0.6	12,471
Female	98.9	98.3	98.2	98.1	98.0	97.3	97.0	96.8	96.7	95.4	94.7	94.5	94.2	95.1	92.6	89.9	9.3	0.8	11,566
Source																			
Card	99.9	99.5	99.5	99.6	99.5	99.0	98.8	98.8	98.8	98.2	97.7	97.7	97.6	97.6	94.8	93.7	6.2	0.1	20,087
Recall	95.5	94.4	93.2	92.3	91.6	90.4	90.4	89.9	88.4	84.6	82.9	83.1	81.4	86.1	83.0	73.8	22.9	3.3	3,950
Maternal years of education																			
None	98.4	97.7	97.7	97.3	97.2	96.6	96.4	96.3	96.0	94.4	94.4	94.2	93.7	94.6	91.6	89.1	9.7	1.2	9,630
Primary (1-5)	99.1	98.4	98.2	98.0	97.8	97.2	97.0	96.9	96.6	95.4	95.4	94.7	94.7	95.5	92.9	90.6	8.7	0.7	4,573
Middle (6-8)	99.3	98.9	98.1	98.3	98.0	97.2	96.5	96.5	96.0	94.9	94.3	94.4	93.7	94.9	91.6	88.4	11.0	0.6	2,403
Secondary (9-10)	99.5	98.9	98.8	99.0	98.9	98.2	98.0	98.3	98.0	97.1	95.4	96.0	95.6	96.2	93.4	90.6	9.1	0.3	3,786
Higher (11 and above)	99.8	99.6	99.4	99.2	99.0	98.6	98.6	98.4	98.0	97.3	95.3	95.7	95.6	96.3	93.9	91.1	8.9	0.1	3,645
Residence																			
Rural	99.1	98.6	98.5	98.4	98.3	97.9	97.6	97.6	97.3	96.1	96.0	96.0	95.6	96.4	94.0	91.7	7.7	0.6	18,081
Urban	99.0	98.3	98.0	97.8	97.5	96.5	96.5	96.3	95.8	94.6	93.0	92.9	92.7	93.5	90.0	86.7	12.4	0.9	5,956
Wealth Quintiles																			
Poorest	97.0	96.5	96.3	96.5	96.4	95.7	95.3	95.6	95.3	94.2	93.8	93.8	93.4	94.1	91.4	89.0	8.5	2.5	1,034
Poor	98.6	97.7	97.8	97.6	97.6	97.0	96.4	96.3	96.0	94.8	93.9	93.7	92.9	94.0	91.8	88.4	10.7	1.0	2,479
Middle	98.7	98.2	98.2	97.7	97.6	97.1	97.0	96.8	96.3	94.8	95.4	94.9	94.4	95.4	92.2	90.0	9.1	0.9	4,224
Rich	99.1	98.6	98.5	98.2	98.0	97.3	97.3	97.1	96.8	95.3	95.3	95.0	94.9	95.7	93.1	91.4	7.9	0.7	6,880
Richest	99.4	98.9	98.5	98.6	98.3	97.7	97.5	97.5	97.2	96.3	94.8	95.1	94.8	95.6	92.6	89.4	10.2	0.5	9,420
Districts																			
ATTOCK	98.5	98.5	97.8	97.8	97.8	97.6	96.7	96.5	96.5	95.4	92.6	92.3	92.1	93.3	87.7	86.4	12.3	1.3	633
RAWALPINDI	98.6	98.1	97.7	96.8	96.5	96.2	95.8	95.9	95.6	94.2	93.0	92.9	91.7	93.1	88.5	87.2	11.4	1.4	637
JHELUM	99.2	99.2	99.1	99.1	99.1	99.1	98.9	98.8	98.9	98.6	98.9	98.5	98.9	98.9	98.5	98.1	1.1	0.8	653
CHAKWAL	98.0	97.8	97.8	96.5	96.5	96.4	96.2	94.5	94.9	94.3	94.6	93.5	93.5	94.2	90.7	89.1	8.8	2.0	629
SARGODHA	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.5	99.5	99.3	99.5	99.5	99.2	99.5	99.2	98.8	0.8	0.4	637
BHAKKAR	99.7	99.0	98.5	98.4	98.4	97.4	96.4	96.1	94.5	93.2	92.6	92.4	91.9	92.5	90.2	89.2	10.6	0.2	643

District																			
KHUSHAB	99.9	99.0	99.9	99.9	99.9	99.9	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7	98.9	0.9	0.1	641
MIANWALI	99.9	99.5	99.9	99.9	99.9	99.8	99.9	99.7	99.9	99.8	99.9	99.7	99.7	99.9	99.7	99.0	0.9	0.1	639
FAISALABAD	97.7	96.6	97.8	96.0	95.7	95.3	95.9	94.0	93.8	93.0	93.1	90.7	91.0	91.6	86.3	82.6	16.6	0.7	641
CHINIOT	99.3	98.4	97.9	97.8	98.0	97.2	95.6	94.9	95.2	94.2	93.1	92.6	92.5	93.3	89.2	86.7	12.9	0.5	635
JHANG	99.8	99.5	99.6	99.6	99.6	99.6	99.5	99.4	99.4	99.4	98.7	98.7	98.7	98.7	96.6	96.4	3.4	0.2	638
TOBA TEK SINGH	99.7	99.6	99.9	100.0	100.0	99.0	99.2	99.3	99.3	97.4	98.3	98.1	98.3	98.3	96.3	95.5	4.5	0.0	638
GUJRANWALA	99.6	99.0	98.6	99.2	99.2	99.1	97.5	98.5	98.3	97.6	95.0	97.6	97.4	97.8	94.1	90.3	9.4	0.4	657
HAFIZABAD	99.8	99.3	99.8	99.8	99.8	99.8	99.2	99.1	99.2	99.2	98.7	98.8	98.6	98.9	97.9	96.8	3.0	0.2	638
GUJRAT	99.0	99.0	99.0	99.0	99.0	99.0	98.8	98.8	98.8	98.4	98.0	98.0	98.0	98.0	97.9	97.8	1.4	0.9	652
MANDI BAHAUDDIN	100.0	99.8	99.8	100.0	100.0	100.0	99.7	99.7	99.7	99.5	99.7	99.7	99.5	99.7	99.6	99.0	1.0	0.0	646
SIALKOT	99.3	99.5	99.2	99.1	99.1	99.2	98.0	98.6	98.6	99.0	89.2	96.9	96.6	97.7	94.4	84.4	15.2	0.4	622
NAROWAL	99.5	99.9	99.9	99.5	99.5	99.5	99.9	99.5	99.5	99.5	99.7	99.2	99.3	99.3	97.7	97.7	2.2	0.1	653
LAHORE	98.0	96.3	95.0	94.8	94.0	91.5	92.3	91.9	90.7	88.6	85.4	84.4	84.2	86.0	81.5	76.4	21.7	2.0	815
KASUR	99.9	99.8	100.0	99.9	99.9	99.6	99.5	99.4	99.4	99.1	98.9	98.7	98.7	98.6	97.7	97.4	2.6	0.0	847
SHEIKHUPURA	97.9	97.1	95.5	94.9	93.6	93.7	92.1	92.4	91.2	91.5	85.2	83.5	82.9	85.4	77.4	71.8	26.3	1.9	641
NANKANA SAHIB	100.0	100.0	99.9	99.9	99.9	99.7	99.9	99.9	99.8	99.5	99.7	99.7	99.5	99.4	98.6	98.0	2.0	0.0	836
OKARA	99.9	99.3	99.5	99.9	99.9	99.9	99.5	99.9	99.4	92.1	99.4	99.7	97.7	99.6	98.0	95.5	4.4	0.1	637
SAHIWAL	100.0	100.0	99.8	99.8	99.8	99.8	99.7	99.7	99.7	96.7	99.7	99.4	99.7	99.7	99.4	98.8	1.2	0.0	644
PAKPATTAN	100.0	99.5	99.8	99.8	99.8	99.8	99.6	99.6	99.6	97.6	99.1	99.0	99.0	99.3	96.8	96.1	3.9	0.0	637
VEHARI	98.8	98.2	97.1	97.2	96.8	96.2	95.7	95.1	94.5	89.8	93.8	93.0	92.2	93.8	89.3	85.2	13.9	0.9	637
MULTAN	100.0	99.7	99.8	99.8	99.9	99.4	99.4	99.4	99.4	99.1	98.7	98.5	98.8	99.3	99.0	97.7	2.3	0.0	637
LODHRAN	99.1	99.1	99.2	99.1	99.1	97.6	98.5	98.2	98.0	97.3	97.8	97.6	97.4	96.6	95.4	94.0	5.2	0.8	648
KHANEWAL	99.9	99.6	99.6	99.2	99.5	98.8	99.1	99.0	98.7	97.4	97.5	97.5	97.2	97.8	97.3	96.4	3.5	0.1	642
DERA GHAZI KHAN	99.8	99.5	99.6	99.3	99.4	99.1	99.3	99.0	99.0	98.4	98.2	97.8	96.4	98.3	95.5	92.4	7.6	0.0	839
RAJANPUR	99.5	96.2	99.5	99.2	99.2	99.1	99.3	99.0	99.0	97.6	99.0	98.6	98.6	98.3	98.2	94.0	5.6	0.3	829
LAYYAH	99.1	99.2	98.4	98.1	97.8	98.1	98.1	98.0	97.5	97.7	96.9	96.5	96.6	97.1	95.9	94.7	4.7	0.6	642
MUZAFFARGARH	100.0	99.8	100.0	99.9	99.8	99.2	99.8	99.5	98.8	99.0	99.8	98.3	96.3	99.5	97.4	93.1	6.9	0.0	640
BAHAWALPUR	99.6	99.3	99.0	98.5	98.5	96.3	98.1	97.8	97.4	95.4	97.3	96.5	96.3	95.7	90.8	89.2	10.6	0.2	642
BAHAWALNAGAR	98.1	97.2	97.0	96.9	96.9	96.9	95.4	95.2	94.5	93.7	93.0	92.9	92.1	93.5	91.0	88.8	9.9	1.3	646
RAHIM YAR KHAN	96.6	96.6	94.3	97.2	97.2	94.3	92.0	95.4	95.6	92.6	89.1	92.9	93.2	93.3	89.4	83.9	13.9	2.3	646

[1] All vaccines from birth to 9 months (excluding RV)

Table 15. Demographic characteristics - Sindh

Level	Clusters Sampled	Households					Children 12-23 months			Wealth Quintiles			% literate[1]	
		Target	Randomized	Completed	Response rate	Household size, mean ± sd	N	Age in months (mean ± sd)	% male children	Too Poorest	Middle	Too Richest	Mothers	Fathers
SINDH	**1,856**	**24,128**	**24,086**	**23,006**	**95.5**	**6.1 ± 3.0**	**23,290**	**17.4 ± 3.5**	**52.6**	**36.8**	**12.6**	**50.6**	**41.5**	**55.3**
JACOBABAD	64	832	832	827	99.4	6.0 ± 2.5	831	17.1 ± 3.6	50.7	60.5	13.6	25.9	19.4	40.3
KASHMORE	64	832	832	814	97.8	6.3 ± 3.7	821	18.3 ± 3.5	55.3	73.8	9.0	17.2	7.8	21.4
SHIKARPUR	64	832	831	831	100.0	6.5 ± 2.6	837	17.8 ± 3.7	55.2	54.9	17.4	27.7	19.6	45.8
LARKANA	64	832	832	827	99.4	5.4 ± 2.1	835	17.6 ± 3.7	52.2	26.6	28.8	44.6	26.3	42.1
KAMBAR SHAHDAD KOT	64	832	832	832	100.0	7.9 ± 4.1	848	17.7 ± 3.5	51.3	62.0	20.6	17.4	15.6	29.9
SUKKUR	64	832	831	738	88.8	6.8 ± 3.3	747	17.6 ± 3.6	53.1	29.8	22.7	47.5	33.8	58.3
GHOTKI	64	832	832	832	100.0	5.7 ± 2.3	834	18.2 ± 3.5	52.3	49.9	23.3	26.8	14.1	52.1
KHAIRPUR	64	832	832	832	100.0	5.8 ± 2.4	836	17.6 ± 3.7	54.5	36.7	20.0	43.3	34.3	57.6
DADU	64	832	832	786	94.5	7.6 ± 4.2	802	16.2 ± 3.1	52.3	59.3	20.8	19.8	19.8	37.3
JAMSHORO	64	832	832	769	92.4	8.9 ± 5.1	830	17.1 ± 3.8	50.8	33.4	18.7	47.9	37.5	58.0
HYDERABAD	64	832	832	700	84.1	7.1 ± 3.5	722	17.7 ± 3.4	56.6	18.3	10.8	70.9	56.4	64.6
TANDO ALLAHYAR	64	832	832	734	88.2	5.3 ± 2.1	745	17.3 ± 3.4	50.1	67.1	12.3	20.6	20.4	35.7
TANDO MUHAMMAD KHAN	64	832	832	813	97.7	6.6 ± 3.3	825	17.2 ± 3.7	46.0	76.5	12.5	11.0	16.6	32.6
MATIARI	64	832	832	809	97.2	6.4 ± 3.5	820	17.4 ± 3.4	52.8	60.6	17.2	22.2	25.9	50.4
BADIN	64	832	832	829	99.6	5.9 ± 3.6	840	17.7 ± 3.8	53.8	75.0	11.9	13.1	13.6	28.5
THATTA	64	832	819	651	79.5	6.2 ± 3.0	666	17.1 ± 3.5	52.9	74.7	10.0	15.3	9.6	17.7
SUJAWAL	64	832	832	604	72.6	6.1 ± 2.8	613	17.1 ± 3.7	51.1	86.6	5.5	7.9	7.2	15.5
MIRPUR KHAS	64	832	832	805	96.8	6.1 ± 3.5	813	17.5 ± 3.6	52.7	61.1	11.6	27.3	29.9	44.9
UMER KOT	64	832	831	753	90.6	5.8 ± 2.5	753	17.1 ± 3.0	58.3	84.2	7.3	8.6	9.8	30.1
THARPARKAR	64	832	832	823	98.9	6.0 ± 3.2	824	17.9 ± 3.4	50.8	91.5	6.9	1.6	10.4	17.8
KARACHI WEST	64	832	832	829	99.6	5.5 ± 2.1	832	17.6 ± 3.2	49.0	3.8	10.9	85.3	62.0	66.3
MALIR	64	832	832	831	99.9	5.7 ± 2.6	837	17.4 ± 3.6	51.4	8.7	13.7	77.6	56.3	67.4
KARACHI SOUTH	64	832	810	808	99.8	5.4 ± 2.9	809	17.3 ± 3.4	49.0	0.0	2.3	97.7	72.9	78.3
KARACHI EAST	64	832	832	809	97.2	6.1 ± 2.5	819	17.4 ± 3.6	59.7	2.6	5.1	92.4	79.3	83.5
KARACHI CENTRAL	64	832	830	823	99.2	5.8 ± 2.6	830	17.4 ± 3.5	49.5	0.5	3.8	95.7	87.7	87.5
KORANGI	64	832	832	831	99.9	5.4 ± 1.4	839	17.4 ± 3.4	55.4	0.0	0.7	99.3	86.1	87.9
NAUSHAHRO FEROZE	64	832	832	830	99.8	6.0 ± 2.9	831	17.2 ± 3.5	53.0	54.5	24.5	21.0	25.2	52.0
SHAHEED BENAZIRABAD	64	832	830	825	99.4	5.4 ± 2.5	828	16.9 ± 3.3	51.7	56.2	19.3	24.5	24.6	56.3
SANGHAR	64	832	832	811	97.5	7.2 ± 3.8	823	17.2 ± 3.5	49.8	56.9	14.9	28.3	22.0	46.1

[1] 1 or more years of education

Table 16. Vaccination status – Sindh

	Birth		6 weeks				10 weeks				14 weeks				9 months	Fully vaccinated[1]	Partially vaccinated	Not vaccinated	Total children
	BCG	OPV0	OPV 1	Penta 1	PCV 1	RV 1	OPV 2	Penta 2	PCV 2	RV 2	OPV 3	Penta 3	PCV 3	IPV	MCV 1				
SINDH	**91.9**	**90.9**	**87.7**	**85.9**	**85.5**	**84.3**	**81.2**	**79.6**	**79.1**	**76.2**	**74.9**	**73.2**	**71.5**	**73.7**	**67.1**	**61.1**	**31.7**	**7.2**	**23,290**
Sex of Child																			
Male	92.3	91.2	88.3	86.7	86.2	84.8	81.8	80.5	80.0	77.0	75.2	73.8	72.2	74.2	67.4	61.6	31.5	6.9	12,138
Female	91.6	90.6	87.2	85.1	84.7	83.7	80.5	78.5	78.1	75.3	74.5	72.6	70.7	73.1	66.7	60.7	31.9	7.5	11,152
Source																			
Card	99.5	99.4	97.0	96.9	96.7	95.7	91.3	90.9	90.7	89.9	85.3	84.8	84.8	84.0	75.6	72.5	27.5	0.0	10,715
Recall	84.4	82.4	78.5	74.9	74.2	72.8	71.0	68.3	67.5	62.5	64.4	61.6	58.2	63.3	58.6	49.8	35.9	14.4	12,575
Maternal years of education																			
None	87.7	86.5	82.7	79.8	79.2	78.2	74.6	72.1	71.5	68.2	67.0	64.8	63.0	66.0	59.4	53.3	35.6	11.1	15,745
Primary (1-5)	95.8	94.4	90.9	89.9	89.6	89.2	84.6	83.5	83.3	81.7	77.7	76.1	75.0	75.9	68.2	63.2	33.3	3.4	1,939
Middle (6-8)	97.3	95.8	92.6	91.8	91.5	89.8	86.9	86.4	85.9	82.9	80.9	79.4	78.0	77.0	70.9	62.4	35.2	2.4	893
Secondary (9-10)	98.6	97.9	95.4	95.0	94.8	92.9	90.0	89.7	89.4	87.5	85.2	85.0	83.0	84.1	76.3	71.7	27.1	1.2	2,086
Higher (11 and above)	99.1	98.6	97.7	98.0	97.7	95.9	95.4	95.9	95.4	92.3	93.1	92.6	90.8	92.4	87.7	81.5	17.8	0.7	2,627
Residence																			
Rural	87.6	86.7	82.9	80.2	79.6	78.6	75.7	73.4	72.7	69.2	68.6	66.3	65.0	67.8	61.6	56.4	32.5	11.1	13,193
Urban	95.8	94.7	92.0	91.0	90.7	89.3	86.1	85.1	84.8	82.5	80.4	79.4	77.3	78.9	72.0	65.4	31.0	3.7	10,097
Wealth Quintiles																			
Poorest	84.3	83.5	78.9	75.7	75.0	73.6	71.4	68.7	68.1	65.1	64.3	61.3	60.1	63.1	57.7	52.3	33.8	13.9	6,251
Poor	86.1	85.2	81.9	78.6	77.9	77.4	73.9	71.2	70.3	66.8	66.2	63.9	62.1	65.3	58.7	53.0	34.4	12.6	4,463
Middle	92.3	90.9	87.6	86.0	85.7	84.5	80.3	78.6	78.1	74.6	73.6	72.1	70.5	72.6	65.5	59.9	33.2	7.0	3,297
Rich	95.0	93.5	90.2	88.1	87.7	87.3	82.3	80.7	80.5	78.0	74.7	73.8	72.5	73.9	67.2	59.2	36.4	4.4	3,518
Richest	97.8	96.8	94.9	94.6	94.3	92.5	90.4	90.1	89.7	87.1	86.0	85.1	82.9	84.4	77.4	71.8	26.2	2.0	5,761
Districts																			
JACOBABAD	82.0	80.8	80.4	71.7	71.1	69.8	63.7	55.6	55.3	47.9	52.9	45.5	44.7	46.4	40.1	34.9	49.3	15.7	831
KASHMORE	70.5	67.6	56.2	48.4	47.6	46.1	43.1	36.2	36.6	30.9	28.2	26.0	26.0	25.9	24.6	19.6	53.1	27.4	821
SHIKARPUR	95.5	95.7	92.4	88.2	88.1	87.3	81.6	77.7	77.5	67.6	72.4	68.4	63.8	71.3	66.3	58.6	37.7	3.8	837
LARKANA	91.6	89.7	85.4	84.8	84.4	84.2	76.9	77.9	78.1	77.2	70.1	72.4	73.2	73.3	65.0	56.8	34.8	8.4	835

KAMBAR SHAHDAD KOT	82.6	78.1	67.9	67.3	66.9	65.5	63.2	62.0	61.8	61.0	54.2	58.7	55.4	59.8	49.2	40.7	42.7	16.6	848
SUKKUR	88.3	89.9	75.0	77.9	77.3	74.2	70.6	71.4	68.0	62.2	66.5	63.8	58.9	64.3	63.0	46.1	45.1	8.9	747
GHOTKI	87.6	87.1	84.7	81.2	79.9	80.1	77.4	74.2	72.9	65.6	68.3	64.9	58.4	66.8	62.9	54.2	33.7	12.1	834
KHAIRPUR	97.6	97.2	96.1	93.8	93.4	93.3	90.2	88.4	87.9	79.9	86.1	84.5	81.0	83.7	78.5	75.5	22.2	2.3	836
DADU	92.4	91.3	88.7	89.1	88.9	87.7	84.7	85.0	81.7	69.5	81.9	81.7	77.0	85.0	77.7	70.3	22.2	7.5	802
JAMSHORO	92.8	86.4	87.8	87.8	87.8	84.9	81.1	81.0	81.0	79.2	75.7	75.2	75.2	75.3	68.1	62.9	30.8	6.2	830
HYDERABAD	92.9	92.6	88.8	90.0	89.9	88.9	80.3	82.1	81.6	81.5	76.2	77.0	73.5	79.3	68.9	63.5	30.6	5.9	722
TANDO ALLAHYAR	95.2	95.7	95.3	94.0	93.1	92.8	92.1	90.5	89.7	87.1	87.2	77.3	84.8	84.4	77.5	68.8	27.3	3.9	745
TANDO M. KHAN	89.4	87.1	85.0	84.9	84.5	82.4	76.9	80.0	79.9	78.1	74.5	77.7	77.5	77.8	72.0	65.8	24.1	10.1	825
MATIARI	90.2	89.3	81.6	85.0	84.6	84.8	72.7	77.6	77.2	77.6	64.2	70.6	69.8	71.3	65.7	55.8	35.5	8.7	820
BADIN	93.2	92.5	89.7	88.4	88.3	87.4	85.6	84.7	84.5	83.7	83.4	82.5	82.5	82.7	80.2	79.2	14.1	6.7	840
THATTA	78.7	77.7	74.5	66.6	66.0	64.5	69.0	62.0	61.3	59.1	62.8	54.6	54.5	57.2	47.5	44.4	39.0	16.6	666
SUJAWAL	67.3	67.7	63.9	49.3	47.5	47.5	57.1	42.6	41.2	41.1	52.6	36.9	36.2	36.5	32.2	30.3	40.0	29.7	613
MIRPUR KHAS	89.5	88.9	88.1	86.5	86.0	86.0	83.3	81.6	81.1	79.0	79.2	78.2	77.8	79.7	71.3	68.6	22.1	9.3	813
UMER KOT	95.4	95.2	92.8	93.8	93.7	88.8	87.9	88.0	89.0	85.1	73.2	74.2	74.2	78.0	72.6	67.4	29.3	3.3	753
THARPARKAR	93.6	92.7	90.9	90.6	90.0	89.9	88.4	88.0	87.3	87.0	85.3	84.8	83.7	86.0	83.1	78.9	15.7	5.4	824
KARACHI WEST	92.7	91.2	88.1	85.8	85.7	85.0	80.3	78.2	78.1	76.8	74.4	72.4	68.9	72.7	62.3	55.7	37.7	6.6	832
MALIR	93.3	91.7	89.2	85.4	85.3	84.4	82.0	79.1	78.9	77.7	72.6	71.0	70.9	70.4	62.7	60.2	33.7	6.1	837
KARACHI SOUTH	98.2	96.7	97.4	96.1	95.4	93.7	94.8	91.3	90.2	88.9	90.3	86.6	78.6	83.5	78.7	66.2	32.5	1.3	809
KARACHI EAST	97.9	95.7	92.0	91.6	91.0	84.3	85.3	85.4	84.4	78.5	80.5	78.6	77.1	75.0	74.1	61.0	37.3	1.7	819
KARACHI CENTRAL	98.5	98.1	96.9	95.0	94.8	93.6	91.9	89.5	89.5	86.7	87.3	84.1	83.6	83.6	75.4	71.7	27.3	1.1	830
KORANGI	97.8	96.2	95.2	94.8	94.5	93.9	91.3	90.8	90.7	90.0	84.8	84.0	84.0	84.1	74.3	72.5	25.3	2.2	839
N. FEROZE	93.8	92.8	90.0	89.5	89.0	89.0	82.3	80.3	80.4	78.5	72.9	72.2	71.8	73.2	64.8	61.7	32.5	5.8	831
S. BENAZIRABAD	91.5	91.2	88.0	87.3	86.9	87.7	81.0	79.8	79.8	80.2	74.6	73.7	73.8	74.8	68.1	66.3	25.4	8.2	828
SANGHAR	84.8	86.1	80.8	76.3	76.1	76.0	69.8	71.0	70.9	71.3	62.2	63.4	62.8	63.3	55.7	48.8	38.2	13.0	823

[1] All vaccines from birth to 9 months (excluding RV)

Table. 17. Demographic characteristics – Balochistan

Level	Clusters Sampled	Households					Children 12-23 months			Wealth Quintiles			% literate[1]	
		Target	Randomized	Completed	Response rate	Household size, mean ± sd	N	Age in months (mean ± sd)	% male children	Too Poorest	Middle	Too Richest	Mothers	Fathers
BALOCHISTAN	**2,112**	**27,456**	**26,591**	**25,431**	**95.6**	**8.4 ± 5.2**	**25,764**	**18.0 ± 3.1**	**57.7**	**59.9**	**21.6**	**18.5**	**16.6**	**21.7**
QUETTA	64	832	824	800	97.1	11.2 ± 5.6	821	17.6 ± 3.1	52.7	25.4	27.1	47.5	25.9	29.1
PISHIN	64	832	781	724	92.7	16.2 ± 6.5	745	17.5 ± 2.6	44.7	33.4	51.2	15.5	9.3	46.2
KILLA ABDULLAH	64	832	796	696	87.4	12.5 ± 7.9	728	18.3 ± 2.7	65.4	39.5	52.7	7.8	8.5	6.5
LORALAI	64	832	808	784	97.0	6.5 ± 3.2	786	18.0 ± 3.2	58.7	50.6	32.1	17.3	31.7	38.6
BARKHAN	64	832	769	746	97.0	7.0 ± 4.6	753	19.2 ± 2.9	64.0	48.6	28.7	22.7	38.6	15.6
MUSAKHEL	64	832	809	759	93.8	6.8 ± 3.3	763	18.6 ± 2.9	63.0	83.8	7.4	8.8	22.8	29.4
KILLA SAIFULLAH	64	832	799	725	90.7	7.1 ± 4.0	728	18.4 ± 3.1	54.7	74.3	17.6	8.2	8.8	16.8
ZHOB	64	832	826	704	85.2	11.8 ± 5.9	714	18.5 ± 3.0	58.6	71.4	11.7	16.9	25.2	24.2
SHERANI	64	832	776	761	98.1	7.9 ± 4.8	815	19.8 ± 2.8	61.2	99.0	0.6	0.3	43.3	43.3
DUKI	64	832	830	826	99.5	9.3 ± 4.1	849	17.5 ± 1.8	54.7	46.8	38.3	15.0	2.8	21.6
SIBI	64	832	814	812	99.8	8.6 ± 3.9	830	18.4 ± 3.1	59.0	65.7	13.2	21.1	18.2	29.2
HARNAI	64	832	829	829	100.0	10.7 ± 3.4	831	19.1 ± 2.4	56.6	36.7	47.2	16.1	0.0	0.0
ZIARAT	64	832	754	731	96.9	8.3 ± 6.1	758	17.5 ± 3.4	52.2	56.8	26.7	16.5	19.0	18.3
KOHLU	64	832	830	828	99.8	7.7 ± 3.3	839	19.6 ± 2.2	69.0	95.9	2.8	1.3	26.0	26.0
DERA BUGTI	64	832	818	818	100.0	11.7 ± 5.3	829	19.2 ± 2.8	76.6	48.6	4.2	47.2	0.2	1.8
KACHHI	64	832	811	773	95.3	7.4 ± 3.6	795	17.9 ± 2.6	63.4	82.8	12.3	4.9	14.1	19.2
JAFFARABAD	64	832	832	821	98.7	8.3 ± 5.2	831	17.2 ± 3.4	47.7	70.0	13.6	16.4	13.9	30.9
NASIRABAD	64	832	832	818	98.3	7.5 ± 3.3	823	17.8 ± 2.8	51.7	76.8	14.9	8.4	1.0	1.6
JHAL MAGSI	64	832	809	777	96.0	8.6 ± 5.0	778	17.6 ± 3.0	57.6	86.4	8.5	5.1	8.7	16.3
SOHBATPUR	64	832	832	813	97.7	6.7 ± 3.1	822	18.0 ± 3.1	51.6	72.4	17.3	10.2	3.2	10.2
KALAT	64	832	725	642	88.6	10.3 ± 5.8	659	18.4 ± 3.0	53.5	85.5	8.3	6.3	11.1	12.8
MASTUNG	64	832	786	635	80.8	10.8 ± 4.7	635	19.6 ± 2.5	70.1	29.6	38.2	32.2	4.6	5.1
KHUZDAR	64	832	806	714	88.6	7.3 ± 3.3	722	18.4 ± 3.2	54.3	89.3	8.1	2.6	26.0	28.4
AWARAN	64	832	828	826	99.8	4.9 ± 2.0	828	18.8 ± 3.0	60.8	99.1	0.4	0.5	39.5	39.6
LASBELA	64	832	779	622	79.8	6.1 ± 2.9	621	17.4 ± 3.7	51.3	68.1	17.6	14.3	14.2	25.2
SHAHEED SIKANDAR ABAD	64	832	765	754	98.6	7.3 ± 2.7	754	18.8 ± 2.4	53.5	77.9	9.2	12.8	0.0	0.0
KECH	64	832	824	822	99.8	5.5 ± 3.3	824	16.8 ± 3.1	69.2	53.8	24.8	21.4	8.7	9.3
GWADAR	64	832	821	820	99.9	5.2 ± 2.1	822	18.7 ± 3.3	58.5	44.2	31.6	24.2	14.2	16.9
PANJGUR	64	832	821	815	99.3	7.8 ± 3.5	818	18.8 ± 2.7	54.1	68.5	20.0	11.5	15.4	20.2
CHAGAI	64	832	825	825	100.0	6.1 ± 2.1	827	18.1 ± 2.2	63.2	91.6	5.8	2.5	6.8	9.3

KHARAN	64	832	775	755	97.4	6.3 ± 2.7	756	18.7 ± 3.8	55.0	90.0	7.8	2.2	43.6	45.5
NUSHKI	64	832	828	828	100.0	6.3 ± 3.1	828	19.8 ± 2.5	49.4	68.7	30.3	1.0	0.0	0.0
WASHUK	64	832	829	828	99.9	6.5 ± 3.7	832	19.2 ± 2.6	62.2	47.0	30.6	22.4	17.3	58.2

[1] 1 or more years of education

Table 18. Vaccination status – Balochistan

	Birth		6 weeks				10 weeks				14 weeks				9 months	Fully vaccinated[1]	Partially vaccinated	Not vaccinated	Total children
	BCG	OPV0	OPV 1	Penta 1	PCV 1	RV 1	OPV 2	Penta 2	PCV 2	RV 2	OPV 3	Penta 3	PCV 3	IPV	MCV 1				
BALOCHISTAN	**59.7**	**58.0**	**55.5**	**52.3**	**51.9**	**51.5**	**50.6**	**47.6**	**47.3**	**46.4**	**45.1**	**42.2**	**42.0**	**44.7**	**42.6**	**37.6**	**26.3**	**36.1**	**25,764**
Sex of Child																			
Male	59.6	57.1	54.4	51.2	50.8	50.6	49.8	46.8	46.5	45.7	44.4	41.6	41.3	44.2	42.2	37.2	26.2	36.6	15,072
Female	59.8	59.3	56.9	53.7	53.3	52.9	51.7	48.6	48.3	47.2	45.9	42.9	42.9	45.4	43.1	38.2	26.4	35.4	10,692
Source																			
Card	95.5	94.5	95.6	95.6	95.7	95.1	87.1	87.0	86.9	86.4	79.1	78.9	78.9	78.8	74.7	66.4	33.1	0.4	3,523
Recall	51.3	49.5	46.0	42.1	41.6	41.3	42.1	38.3	38.0	37.0	37.1	33.6	33.3	36.7	35.1	30.9	24.7	44.5	22,241
Maternal years of education																			
None	58.1	55.5	52.9	50.5	50.1	49.9	47.7	45.4	45.2	44.4	41.9	39.9	39.7	42.6	40.6	35.5	26.2	38.3	21,587
Primary (1-5)	42.1	48.9	50.4	38.2	38.5	38.4	46.6	35.8	35.7	34.7	43.2	32.0	32.0	33.9	32.5	27.5	30.9	41.6	882
Middle (6-8)	56.2	60.7	60.7	51.3	51.2	49.6	56.1	48.1	46.9	45.8	52.5	43.7	43.9	44.2	39.3	36.7	29.3	34.0	836
Secondary (9-10)	74.5	74.4	70.6	62.6	61.4	60.7	67.9	59.8	58.4	55.8	61.7	53.2	51.8	56.5	55.2	47.8	29.8	22.4	1,170
Higher (11 and above)	81.9	85.6	80.9	77.9	77.8	77.2	79.1	75.4	76.0	74.2	75.1	71.6	71.9	73.1	70.0	66.2	20.7	13.1	1,289
Residence																			
Rural	56.4	54.2	51.5	48.4	48.0	47.7	46.2	43.4	43.1	42.4	40.7	37.9	37.9	40.5	38.6	33.6	26.8	39.5	21,875
Urban	68.5	68.3	66.3	62.8	62.3	61.8	62.6	58.7	58.6	57.0	57.0	53.8	53.2	56.3	53.5	48.5	24.7	26.8	3,889
Wealth Quintiles																			
Poorest	45.8	45.2	42.1	37.9	37.5	37.4	36.7	33.3	33.1	32.8	33.2	29.8	30.0	32.0	30.0	26.7	24.2	49.1	10,610
Poor	60.6	60.7	58.1	53.9	53.5	53.4	52.6	48.4	48.2	47.2	46.1	42.2	41.9	44.9	43.2	37.4	28.2	34.4	6,706
Middle	69.0	67.3	66.2	63.8	63.4	62.7	61.3	58.5	58.3	56.6	53.7	51.6	50.9	54.9	52.7	45.7	27.1	27.2	4,928
Rich	69.5	67.1	64.7	63.3	63.0	62.3	62.2	60.7	60.2	58.5	56.6	54.7	54.5	57.0	54.0	49.4	22.3	28.3	2,290
Richest	79.0	67.5	63.4	62.8	62.6	62.2	60.2	59.4	58.5	58.1	54.2	53.4	53.3	55.5	52.4	48.3	32.6	19.1	1,230
Districts																			
QUETTA	60.2	58.5	56.8	56.7	56.7	56.2	50.5	50.4	49.9	49.5	43.1	43.1	43.1	45.6	42.0	35.9	26.6	37.5	821
PISHIN	75.1	63.2	62.6	62.6	62.3	62.8	60.2	60.0	59.7	49.2	55.4	55.4	51.1	57.9	58.8	48.4	27.9	23.6	745
KILLA ABDULLAH	65.7	59.9	67.2	60.4	59.8	60.6	66.3	59.7	58.8	59.6	64.4	57.6	56.9	59.1	60.8	46.4	24.7	29.0	728

LORALAI	47.3	49.3	43.9	35.4	33.1	32.6	36.1	29.0	28.2	27.9	32.8	26.9	26.1	34.1	27.4	21.4	33.4	45.2	786
BARKHAN	64.6	64.1	55.0	54.9	54.9	54.6	54.5	54.4	54.4	54.0	53.2	52.9	53.0	52.8	48.9	47.7	17.5	34.8	753
MUSAKHEL	23.6	20.8	20.2	18.5	17.8	17.6	17.3	15.7	15.4	15.4	15.1	13.5	13.8	14.8	17.2	12.5	13.5	74.0	763
KILLA SAIFULLAH	55.2	52.9	52.6	47.5	47.1	46.9	44.6	44.1	44.0	44.1	26.7	25.2	25.1	27.3	27.6	22.0	36.2	41.8	728
ZHOB	32.5	32.3	30.9	31.2	31.2	31.0	29.8	29.4	29.7	23.4	29.2	28.8	28.8	29.1	29.4	27.1	7.0	65.8	714
SHERANI	28.5	27.8	23.6	23.7	23.5	22.7	23.2	23.0	22.9	22.6	22.8	22.7	22.7	22.7	22.5	21.6	7.9	70.5	815
DUKI	41.7	81.9	38.0	37.2	36.7	37.2	34.4	33.6	33.1	33.6	31.3	29.9	29.7	31.0	28.5	25.3	59.7	15.0	849
SIBI	29.8	28.4	28.4	28.6	28.4	28.3	26.3	25.8	23.9	23.8	21.9	21.4	21.1	23.0	20.9	17.7	13.6	68.7	830
HARNAI	89.8	90.0	89.9	89.9	89.9	89.9	90.0	90.0	90.0	90.0	89.9	89.9	89.9	90.0	89.7	89.2	0.9	9.9	831
ZIARAT	43.7	43.5	41.8	40.9	42.1	41.1	38.7	37.5	38.9	34.3	34.7	33.3	34.2	35.3	35.2	29.7	15.7	54.6	758
KOHLU	60.4	58.3	56.9	57.1	57.2	57.2	56.8	57.0	57.0	57.1	56.8	56.9	56.9	57.2	57.5	56.5	4.5	39.0	839
DERA BUGTI	74.9	10.8	8.9	9.0	9.0	9.1	8.8	9.0	8.9	9.1	8.6	8.8	8.7	8.9	9.0	8.3	66.7	25.1	829
KACHHI	13.5	12.1	12.0	11.6	11.3	11.5	11.9	11.5	11.1	11.3	11.9	11.5	11.1	11.7	11.6	10.3	3.4	86.3	795
JAFFARABAD	80.8	79.4	75.1	73.9	72.3	71.3	66.5	65.3	64.3	62.7	54.5	52.6	52.0	54.8	44.3	40.4	42.6	17.1	831
NASIRABAD	55.6	57.8	56.4	54.1	54.1	53.0	40.6	38.0	37.4	37.8	30.3	28.3	27.8	35.3	27.3	23.6	36.3	40.1	823
JHAL MAGSI	35.4	37.7	24.7	20.5	19.5	20.2	22.9	19.5	18.3	19.2	19.4	15.8	14.2	19.1	16.2	12.2	31.4	56.4	778
SOHBATPUR	84.8	75.3	69.5	69.4	69.4	68.9	68.4	68.4	67.7	65.7	63.3	63.1	62.7	63.1	58.6	56.3	29.7	14.0	822
KALAT	40.8	43.7	37.4	35.4	34.9	35.1	35.9	34.3	34.4	34.3	34.7	33.1	33.0	34.4	34.8	30.3	17.1	52.6	659
MASTUNG	45.0	17.2	14.1	13.2	12.6	13.6	12.3	10.6	10.9	11.6	10.6	9.6	9.6	11.1	10.7	7.8	41.4	50.8	635
KHUZDAR	29.5	45.4	37.9	18.0	17.9	18.2	33.6	17.5	17.5	17.8	31.3	16.8	16.9	17.4	14.6	12.9	40.6	46.6	722
AWARAN	45.9	45.9	45.9	45.9	45.9	45.9	45.7	45.7	45.7	45.7	45.4	45.4	45.3	45.4	44.2	44.0	2.0	54.0	828
LASBELA	60.9	57.3	53.2	53.6	53.3	50.0	51.9	51.3	50.9	49.4	49.4	48.2	48.2	51.4	48.6	44.3	17.4	38.4	621
S. SIKANDAR ABAD	47.1	46.8	46.7	47.1	47.1	47.1	44.7	45.1	45.1	45.1	45.6	46.0	46.0	46.0	44.6	44.0	3.4	52.6	754
KECH	78.0	76.8	76.6	72.5	72.9	71.6	75.2	70.9	71.2	69.6	66.9	62.5	62.9	67.4	66.9	61.3	17.3	21.4	824
GWADAR	74.4	71.1	64.9	64.7	64.3	64.4	64.5	64.5	64.1	63.8	64.0	63.6	63.2	63.6	61.1	58.9	16.6	24.5	822
PANJGUR	70.8	70.2	69.7	69.3	69.3	69.9	69.7	69.3	69.3	69.7	69.1	68.8	68.8	69.2	68.3	66.9	4.3	28.8	818
CHAGAI	91.1	91.3	89.7	88.9	81.7	83.6	73.2	69.5	62.8	67.3	53.2	41.4	44.8	57.6	59.1	33.0	59.2	7.9	827
KHARAN	93.7	96.5	93.1	87.8	87.7	90.2	87.1	87.0	86.7	84.8	79.4	78.0	78.2	78.5	73.9	70.4	27.3	2.3	756
NUSHKI	99.2	98.0	98.7	99.2	98.2	97.5	38.5	21.1	28.1	19.4	11.4	9.8	9.9	15.3	14.9	8.1	91.9	0.0	828
WASHUK	90.5	87.7	86.7	86.6	86.7	86.7	86.6	86.6	86.7	86.7	86.7	86.6	86.7	86.7	86.7	86.5	4.1	9.3	832

[1] All vaccines from birth to 9 months (excluding RV)

Table 19. Demographic characteristics – KP

Level	Clusters Sampled	Households					Children 12-23 months			Wealth Quintiles			% literate[1]	
		Target	Randomized	Completed	Response rate	Household size, mean ± sd	N	Age in months (mean ± sd)	% male children	Too Poorest	Middle	Too Richest	Mothers	Fathers
KHYBER PAKHTUNKHWA	**1,386**	**18,018**	**17,878**	**16,967**	**94.9**	**8.6 ± 5.1**	**17,432**	**17.8 ± 3.4**	**52.7**	**19.2**	**25.9**	**54.9**	**42.4**	**62.4**
CHITRAL	64	832	832	801	96.3	9.6 ± 4.2	820	17.9 ± 3.3	53.6	40.4	35.7	23.9	79.3	88.7
UPPER DIR	49	637	630	625	99.2	7.5 ± 3.7	632	17.7 ± 3.3	55.8	34.2	52.0	13.8	5.9	20.7
LOWER DIR	49	637	637	547	85.9	12.4 ± 7.0	591	18.0 ± 3.6	48.9	35.7	26.0	38.3	47.6	60.7
SWAT	49	637	637	624	98.0	8.8 ± 4.5	634	17.7 ± 3.3	52.0	6.9	26.6	66.5	50.5	68.7
SHANGLA	64	832	832	817	98.2	9.8 ± 4.5	834	17.8 ± 3.1	59.1	31.0	37.3	31.7	19.5	51.5
BUNER	49	637	637	635	99.7	9.1 ± 5.6	663	17.8 ± 3.4	54.6	22.0	20.9	57.0	27.3	49.1
MALAKAND PROTECTED AREA	49	637	637	594	93.2	9.5 ± 5.8	594	17.8 ± 3.5	51.6	18.6	21.4	60.0	41.2	53.2
KOHISTAN	64	832	832	814	97.8	9.5 ± 5.5	904	18.3 ± 2.8	61.3	85.7	9.2	5.2	10.3	34.1
MANSEHRA	49	637	634	593	93.5	7.4 ± 3.6	602	17.8 ± 3.3	50.6	13.5	23.5	63.0	54.0	72.1
BATAGRAM	64	832	728	698	95.9	9.1 ± 4.7	700	18.0 ± 3.2	54.9	37.0	27.7	35.3	28.6	37.0
ABBOTTABAD	49	637	635	625	98.4	7.1 ± 3.2	635	18.2 ± 3.4	50.7	2.6	17.7	79.7	74.3	85.7
HARIPUR	49	637	637	611	95.9	6.9 ± 3.0	611	18.3 ± 3.3	53.7	9.0	16.4	74.6	76.4	86.2
TORGHAR	64	832	829	746	90.0	7.4 ± 3.1	751	18.2 ± 3.1	55.5	55.6	38.8	5.5	3.0	52.5
MARDAN	49	637	637	633	99.4	7.4 ± 4.1	633	17.9 ± 3.5	50.6	6.2	22.0	71.8	39.6	60.1
SWABI	49	637	637	522	81.9	7.7 ± 4.2	531	18.0 ± 3.6	52.3	11.3	23.5	65.2	51.7	70.5
CHARSADDA	64	832	832	819	98.4	5.6 ± 3.7	827	17.6 ± 3.4	52.8	12.6	36.8	50.6	42.9	70.4
PESHAWAR	49	637	633	612	96.7	10.2 ± 6.0	646	17.5 ± 3.3	52.2	7.3	17.7	75.0	36.0	59.2
NOWSHERA	49	637	633	600	94.8	9.9 ± 5.3	616	17.3 ± 3.3	50.9	5.6	16.2	78.2	47.5	63.0
KOHAT	43	559	559	555	99.3	7.8 ± 4.1	559	17.6 ± 3.7	53.3	29.5	24.2	46.3	31.1	55.3
HANGU	64	832	830	739	89.0	12.2 ± 7.5	773	17.7 ± 3.3	54.1	44.2	26.6	29.2	47.8	39.9
KARAK	64	832	828	675	81.5	10.2 ± 7.3	700	17.6 ± 3.4	55.6	38.8	39.6	21.6	55.2	65.6
BANNU	62	806	806	777	96.4	8.7 ± 4.6	794	17.5 ± 3.5	50.9	24.8	39.6	35.6	30.4	67.2
LAKKI MARWAT	62	806	806	785	97.4	9.9 ± 5.4	813	18.1 ± 3.9	51.9	34.0	37.5	28.6	24.3	73.2
DERA ISMAIL KHAN	61	793	792	786	99.2	7.5 ± 4.4	803	17.6 ± 3.4	52.6	19.4	30.0	50.6	40.4	59.4
TANK	58	754	748	734	98.1	9.2 ± 6.2	766	17.5 ± 3.4	54.3	46.0	27.8	26.2	25.4	53.0

[1] 1 or more years of education

Table 20. Vaccination status – KP

	Birth		6 weeks				10 weeks				14 weeks				9 months	Fully vaccinated[1]	Partially vaccinated	Not vaccinated	Total children
	BCG	OPV0	OPV 1	Penta 1	PCV 1	RV 1	OPV 2	Penta 2	PCV 2	RV 2	OPV 3	Penta 3	PCV 3	IPV	MCV 1				
KHYBER PAKHTUNKHWA	**87.1**	**85.9**	**84.8**	**83.8**	**83.3**	**82.5**	**80.2**	**79.6**	**79.1**	**77.7**	**75.2**	**74.3**	**73.7**	**75.9**	**73.1**	**68.4**	**20.3**	**11.4**	**17,432**
Sex of Child																			
Male	87.3	86.0	85.1	84.0	83.4	82.7	80.4	79.8	79.2	77.9	75.5	74.4	74.0	76.2	73.3	68.5	20.4	11.1	9,291
Female	86.8	85.8	84.6	83.5	83.1	82.4	79.9	79.4	78.9	77.5	74.9	74.2	73.5	75.6	72.8	68.2	20.1	11.7	8,141
Source																			
Card	98.4	98.3	97.7	97.7	97.7	97.6	92.8	92.7	92.7	92.6	88.3	88.3	88.2	88.5	85.3	82.2	17.8	0.1	9,012
Recall	71.8	69.2	67.5	65.1	63.9	62.4	63.3	61.9	60.7	57.7	57.7	55.6	54.3	59.1	56.6	49.9	23.6	26.5	8,420
Maternal years of education																			
None	82.3	81.0	79.5	78.1	77.3	76.3	74.0	73.1	72.4	70.8	68.1	66.8	66.2	68.6	66.0	60.5	24.0	15.6	10,731
Primary (1-5)	92.0	91.2	90.1	89.6	89.3	89.0	85.8	85.4	85.2	84.1	83.0	82.5	81.3	83.3	79.9	76.3	16.6	7.1	1,801
Middle (6-8)	91.8	90.8	91.3	91.2	91.3	90.6	88.0	88.0	87.8	86.7	83.1	83.0	82.9	84.3	81.9	78.5	14.9	6.6	1,094
Secondary (9-10)	94.4	93.6	92.4	91.8	91.6	91.4	89.4	89.3	89.0	88.0	85.1	85.0	84.4	87.1	82.9	79.3	15.5	5.2	1,850
Higher (11 and above)	95.3	94.0	94.4	93.7	93.7	93.2	91.2	90.8	90.6	89.9	87.8	87.2	87.1	88.4	86.0	82.4	13.7	3.9	1,956
Residence																			
Rural	85.9	84.6	83.5	82.4	81.8	80.9	78.9	78.3	77.7	76.2	73.9	72.8	72.2	74.3	71.7	66.8	20.8	12.4	15,473
Urban	91.8	91.4	90.6	89.8	89.7	89.6	85.5	85.1	84.9	84.1	81.0	80.6	80.2	82.9	78.8	75.1	17.9	6.9	1,959
Wealth Quintiles																			
Poorest	68.2	63.7	61.7	59.9	59.5	58.3	56.6	54.9	54.8	53.0	48.6	47.1	46.2	50.5	48.0	40.4	30.2	29.4	1,495
Poor	78.4	76.1	74.4	72.2	70.6	69.3	68.6	67.4	65.9	64.3	62.5	60.3	59.9	62.0	60.7	54.2	26.5	19.3	3,447
Middle	83.2	82.2	81.0	79.8	78.8	77.7	75.4	74.6	73.9	72.3	70.0	68.9	68.2	70.2	67.4	62.0	23.6	14.4	4,889
Rich	91.5	90.9	90.0	89.4	89.3	88.8	85.9	85.6	85.3	83.9	81.7	81.3	80.5	82.5	79.0	75.2	17.3	7.5	4,764
Richest	94.7	93.9	93.4	92.9	92.9	92.6	89.8	89.6	89.5	88.8	85.6	85.2	85.0	87.2	84.2	80.8	14.7	4.5	2,837
Districts																			
CHITRAL	98.7	97.6	98.3	98.3	98.3	97.9	97.9	98.0	98.0	97.8	96.9	96.5	96.9	97.0	95.3	92.9	5.8	1.3	820
UPPER DIR	83.7	80.3	82.4	77.6	69.5	70.1	73.4	69.4	61.7	62.5	65.3	56.3	56.4	58.2	58.2	52.1	35.0	12.9	632
LOWER DIR	95.3	94.4	90.1	89.8	89.1	88.3	85.2	85.4	84.8	83.2	80.5	80.4	79.5	79.7	73.9	71.5	24.3	4.2	591
SWAT	96.4	95.9	95.2	95.4	95.3	95.6	93.9	93.9	93.9	92.8	92.7	92.4	90.9	93.1	90.6	87.2	9.5	3.3	634

SHANGLA	90.0	89.1	90.5	87.9	87.4	87.4	87.6	85.3	84.8	84.5	84.9	81.8	79.9	82.4	82.3	75.4	16.2	8.4	834
BUNER	85.4	84.9	83.3	81.3	80.6	78.6	78.8	78.2	77.0	72.8	71.2	69.7	69.3	71.5	67.0	62.3	24.7	12.9	663
MALAKAND PROTECTED AREA	94.0	93.1	90.1	90.1	89.9	90.1	88.0	87.9	87.8	87.5	84.7	84.7	84.4	84.6	82.7	79.9	14.1	6.0	594
KOHISTAN	73.6	61.2	62.1	56.5	56.1	53.9	56.3	52.7	52.7	49.0	43.1	40.2	38.5	47.7	48.0	29.4	46.7	23.9	904
MANSEHRA	92.6	92.0	92.4	91.6	91.5	90.7	88.1	88.1	88.0	86.3	84.0	83.9	83.7	84.2	80.9	78.7	14.8	6.4	602
BATAGRAM	70.6	68.5	67.7	67.2	66.9	65.7	60.8	60.2	59.8	58.4	54.6	53.9	53.8	55.3	50.5	44.2	29.3	26.5	700
ABBOTTABAD	97.9	97.7	97.3	97.0	97.0	95.2	95.1	95.0	95.0	93.3	92.2	92.1	92.1	91.9	88.6	88.2	9.8	2.0	635
HARIPUR	97.1	96.6	96.0	95.8	95.8	95.8	95.2	95.2	95.1	94.5	94.2	94.2	93.6	93.8	92.3	90.3	7.0	2.7	611
TORGHAR	69.4	67.3	67.0	64.8	63.0	49.5	55.8	54.2	53.9	43.9	47.4	46.1	45.0	49.8	47.8	37.8	34.3	28.0	751
MARDAN	94.6	93.1	91.8	90.5	90.6	89.7	86.9	86.7	86.6	84.6	72.6	72.3	72.0	81.0	75.8	66.7	28.5	4.8	633
SWABI	91.5	91.2	88.7	88.1	88.1	88.1	84.5	84.5	84.5	81.3	81.0	81.0	80.5	81.0	78.8	76.6	15.3	8.1	531
CHARSADDA	88.8	87.0	83.4	83.2	82.9	82.8	80.6	80.5	80.2	77.9	77.3	76.7	75.2	77.2	75.2	69.6	20.7	9.6	827
PESHAWAR	90.4	89.7	89.7	88.9	88.9	88.2	81.5	81.2	81.2	80.8	77.2	77.3	76.9	78.6	73.8	70.5	22.4	7.1	646
NOWSHERA	92.5	92.5	92.0	91.4	91.7	91.1	89.1	88.9	88.9	88.7	86.2	86.2	86.2	86.8	82.8	81.9	12.1	6.0	616
KOHAT	85.0	84.4	82.3	81.4	81.1	81.0	80.4	79.6	79.3	78.9	76.8	76.0	76.0	77.0	72.5	70.9	14.7	14.5	559
HANGU	67.2	65.0	64.3	64.0	63.3	62.8	60.0	59.8	59.4	58.9	54.2	53.8	53.4	54.3	49.9	46.2	23.4	30.4	773
KARAK	68.8	64.3	66.0	65.9	65.8	64.2	61.8	61.8	61.8	61.1	55.2	55.1	54.9	55.1	57.3	49.6	20.9	29.4	700
BANNU	68.9	73.7	67.3	64.5	62.1	61.3	60.0	57.9	55.4	55.2	54.9	52.3	49.5	52.2	54.1	42.7	33.6	23.7	794
LAKKI MARWAT	44.9	42.8	42.6	41.6	40.9	40.2	36.7	36.4	35.4	34.3	33.0	32.3	31.7	34.5	35.2	28.7	19.9	51.4	813
DERA ISMAIL KHAN	76.6	75.6	74.5	73.9	74.0	73.3	66.7	65.8	66.2	65.7	62.4	61.0	61.6	64.3	61.5	55.8	22.1	22.0	803
TANK	70.3	71.1	69.9	66.6	66.0	66.1	67.9	64.9	63.4	60.4	65.1	61.6	60.3	63.0	59.6	56.0	17.0	27.0	766

[1] All vaccines from birth to 9 months (excluding RV)

Table 21. Demographic characteristics –KP-NMDS (FATA)

Level	Clusters Sampled	Households					Children 12-23 months			Wealth Quintiles			% literate[1]	
		Target	Randomized	Completed	Response rate	Household size, mean ± sd	N	Age in months (mean ± sd)	% male children	Too Poorest	Middle	Too Richest	Mothers	Fathers
KP-NMDs	**467**	**6,071**	**5,968**	**5,665**	**94.9**	**9.9 ± 6.2**	**5,779**	**18.2 ± 3.3**	**56.6**	**65.1**	**23.0**	**12.0**	**16.9**	**30.6**
BAJAUR	64	832	830	823	99.2	11.2 ± 6.7	850	18.4 ± 3.4	48.1	79.2	17.3	3.5	10.1	15.3
KHYBER	64	832	832	795	95.6	11.0 ± 6.9	814	17.8 ± 3.1	53.9	44.6	34.8	20.6	9.2	42.4
MOHMAND	64	832	827	813	98.3	8.8 ± 6.1	821	17.7 ± 3.6	58.8	42.9	22.0	35.1	5.1	5.7
KURRAM	64	832	832	819	98.4	11.1 ± 7.2	838	17.6 ± 3.1	55.9	59.6	21.3	19.1	22.8	28.5
ORAKZAI	64	832	828	744	89.9	9.6 ± 5.9	768	18.7 ± 3.4	58.3	88.9	10.3	0.8	17.9	12.7
NORTH WAZIRISTAN	64	832	826	792	95.9	8.0 ± 5.5	792	19.4 ± 3.2	61.6	57.7	33.1	9.2	23.5	53.4
SOUTH WAZIRISTAN	64	832	751	638	85.0	8.6 ± 3.8	652	18.1 ± 2.5	68.8	91.1	8.4	0.5	39.9	39.9
FR Areas	19	247	242	241	99.6	9.4 ± 4.8	244	18.2 ± 3.8	53.9	62.2	28.2	9.6	10.7	34.4

[1] 1 or more years of education

Table 22. Vaccination status - KP-NMDs (FATA)

	Birth		6 weeks				10 weeks				14 weeks				9 months	Fully vaccinated[1]	Partially vaccinated	Not vaccinated	Total children
	BCG	OPV0	OPV 1	Penta 1	PCV 1	RV 1	OPV 2	Penta 2	PCV 2	RV 2	OPV 3	Penta 3	PCV 3	IPV	MCV 1				
KP-NMDs	**59.5**	**58.3**	**59.5**	**58.9**	**58.3**	**58.4**	**54.9**	**53.7**	**53.5**	**53.4**	**51.0**	**49.6**	**49.5**	**51.3**	**49.4**	**42.8**	**20.1**	**37.1**	**5,779**
Sex of Child																			
Male	57.3	55.6	56.9	56.2	55.2	55.8	53.0	51.3	51.2	51.0	49.3	47.3	47.3	49.6	48.3	41.6	18.5	39.9	3,325
Female	62.4	61.8	62.8	62.5	62.2	61.7	57.3	56.9	56.6	56.5	53.1	52.5	52.3	53.5	50.9	44.3	22.2	33.4	2,454
Source																			
Card	95.1	94.6	97.4	97.5	97.5	97.2	88.8	88.6	88.6	88.4	80.7	80.7	80.4	80.5	74.8	68.5	31.4	0.2	2,678
Recall	35.4	33.6	33.7	32.8	31.7	32.1	31.9	30.0	29.8	29.7	30.8	28.4	28.5	31.5	32.2	25.3	12.5	62.2	3,101
Maternal years of education																			
None	61.5	60.4	61.3	60.7	60.1	60.1	56.7	55.6	55.3	55.2	52.8	51.5	51.3	53.1	51.2	44.6	20.3	35.1	4,732
Primary (1-5)	48.9	46.9	49.0	48.7	47.3	48.0	43.8	40.3	42.0	41.2	37.4	33.7	35.1	37.5	39.4	29.2	24.3	46.6	266
Middle (6-8)	49.4	46.4	49.3	49.6	49.3	49.2	45.1	45.1	44.8	44.6	42.5	42.5	42.1	43.4	38.4	33.8	18.1	48.1	330
Secondary (9-10)	43.4	42.3	45.2	43.8	42.6	44.7	41.8	39.2	39.2	41.4	39.3	36.7	36.5	39.6	35.8	32.0	13.7	54.3	248

Higher (11 and above)	59.9	57.4	60.6	61.8	60.3	60.7	56.6	56.5	55.6	54.5	52.9	52.1	52.0	52.9	51.4	43.3	20.6	36.0	203
Residence																			
Rural	59.0	57.7	59.0	58.4	57.7	57.9	54.3	53.1	52.9	52.8	50.3	48.9	48.8	50.7	49.1	42.3	20.1	37.5	5,716
Urban	75.5	75.5	75.5	75.5	75.5	75.5	73.8	73.8	73.8	73.8	73.3	72.5	72.5	69.1	59.1	56.5	19.0	24.5	63
Wealth Quintiles																			
Poorest	49.1	48.1	49.6	49.6	48.5	48.5	45.4	45.4	44.2	44.4	42.4	41.6	41.3	42.6	42.7	35.6	18.3	46.1	1,578
Poor	57.4	56.2	58.5	57.6	57.2	56.9	53.3	51.3	51.8	51.1	49.3	47.3	47.4	50.1	48.7	40.8	20.5	38.7	2,093
Middle	67.0	64.9	65.3	64.5	63.8	64.8	61.4	59.5	59.6	60.0	57.5	55.7	55.6	57.5	54.1	48.1	20.6	31.4	1,301
Rich	73.2	72.8	72.0	72.3	71.9	71.7	66.6	66.8	66.6	66.7	60.1	60.3	60.1	60.4	53.8	51.2	23.8	25.0	668
Richest	90.2	90.2	86.0	86.0	84.9	86.0	83.2	83.2	82.1	82.1	80.7	79.4	79.0	79.4	81.0	76.3	15.8	7.9	139
Districts																			
BAJAUR	79.1	73.4	74.6	74.7	72.5	73.0	69.3	69.0	66.5	64.7	65.1	64.3	62.0	65.5	67.0	56.3	24.9	18.8	850
KHYBER	84.2	83.4	83.6	83.1	83.0	82.9	79.3	79.3	79.3	79.2	73.8	73.0	73.3	73.3	68.9	65.2	20.1	14.7	814
MOHMAND	70.7	70.3	70.3	70.3	70.2	70.2	63.3	63.3	63.3	63.3	55.3	55.3	55.3	55.3	51.9	46.2	28.4	25.4	821
KURRAM	76.3	74.2	77.9	77.6	77.9	77.4	70.8	70.6	70.8	70.2	65.3	65.0	65.2	65.0	54.5	52.4	26.4	21.2	838
ORAKZAI	68.1	66.3	70.8	69.7	69.7	69.7	65.1	64.0	64.0	64.1	60.2	59.1	59.0	59.0	53.3	48.6	27.6	23.7	768
NORTH WAZIRISTAN	31.8	32.0	36.0	33.4	31.7	33.5	33.8	29.6	29.1	29.7	30.6	26.3	25.8	30.5	32.3	22.8	17.1	60.1	792
SOUTH WAZIRISTAN	5.5	4.3	5.1	5.6	5.5	5.5	4.3	4.8	4.6	5.3	4.3	4.8	4.6	4.8	4.6	3.3	2.4	94.3	652
FR Areas	46.7	51.4	47.6	47.0	46.9	45.8	41.6	36.8	40.4	41.9	41.6	36.8	40.4	45.3	47.5	33.8	17.7	48.4	244

[1] All vaccines from birth to 9 months (excluding RV)

Table 23. Demographic characteristics – GB

Level	Clusters Sampled	Households					Children 12-23 months			Wealth Quintiles			% literate[1]	
		Target	Randomized	Completed	Response rate	Household size, mean ± sd	N	Age in months (mean ± sd)	% male children	Too Poorest	Middle	Too Richest	Mothers	Fathers
GILGIT-BALTISTAN	**433**	**5,629**	**5,628**	**5,390**	**95.8**	**9.9 ± 5.2**	**5,483**	**17.6 ± 3.5**	**52.7**	**44.7**	**28.3**	**27.0**	**55.5**	**70.9**
GILGIT	64	832	832	739	88.8	9.0 ± 4.2	769	17.6 ± 3.4	51.3	17.6	27.2	55.3	73.2	78.8
GHIZER	64	832	832	822	98.8	9.7 ± 4.5	838	17.7 ± 3.5	51.9	31.6	45.0	23.4	68.0	79.6
HUNZA	32	416	415	399	96.1	7.8 ± 3.1	404	17.6 ± 3.5	51.9	7.7	37.1	55.2	91.6	92.7
NAGAR	32	416	416	412	99.0	9.7 ± 4.9	420	17.8 ± 3.3	47.8	18.8	48.2	33.0	78.6	78.7
GHANCHE	49	637	637	614	96.4	9.7 ± 4.7	622	17.4 ± 3.2	51.2	78.1	19.0	2.8	49.2	73.8
BALTISTAN	64	832	832	801	96.3	10.3 ± 5.6	809	17.8 ± 3.5	52.1	53.3	23.7	23.0	48.7	71.6
SHIGAR	32	416	416	401	96.4	11.0 ± 6.0	403	17.3 ± 3.5	54.6	88.6	11.2	0.3	25.2	49.2
KHARMANG	32	416	416	403	96.9	8.9 ± 5.3	410	17.5 ± 3.5	53.7	70.8	24.2	5.0	57.3	76.0
DIAMIR	43	559	559	541	96.8	12.0 ± 6.8	545	17.8 ± 3.6	59.1	66.2	22.9	10.9	16.8	41.2
ASTORE	21	273	273	258	94.5	9.6 ± 4.7	263	17.1 ± 3.4	52.4	52.8	29.7	17.6	49.5	72.2

[1] 1 or more years of education

Table 24. Vaccination status – GB

	Birth		6 weeks				10 weeks				14 weeks				9 months	Fully vaccinated[1]	Partially vaccinated	Not vaccinated	Total children
	BCG	OPV0	OPV 1	Penta 1	PCV 1	RV 1	OPV 2	Penta 2	PCV 2	RV 2	OPV 3	Penta 3	PCV 3	IPV	MCV 1				
GILGIT - BALTISTAN	**93.1**	**93.8**	**94.0**	**89.7**	**89.2**	**85.7**	**89.9**	**86.8**	**86.3**	**81.7**	**84.6**	**82.2**	**81.1**	**83.7**	**81.2**	**73.3**	**22.4**	**4.3**	**5,483**
Sex of Child																			
Male	92.9	93.8	94.4	89.8	89.5	85.4	90.0	86.7	86.3	81.3	85.1	82.4	81.5	83.9	81.3	73.9	21.7	4.4	2,865
Female	93.3	93.9	93.4	89.5	88.9	86.0	89.7	86.8	86.3	82.2	84.1	81.9	80.6	83.5	81.1	72.5	23.2	4.2	2,618
Source																			
Card	99.7	99.6	99.5	99.4	99.4	98.4	97.3	97.2	97.2	96.2	94.9	94.7	94.7	94.4	90.3	88.7	11.3	0.0	2,987
Recall	85.9	87.4	87.8	78.9	77.8	71.6	81.7	75.2	74.3	65.7	73.3	68.3	66.1	72.0	71.1	56.2	34.7	9.1	2,496
Maternal years of education																			
None	87.2	89.1	89.1	80.9	80.4	76.6	83.5	77.0	76.5	72.3	77.6	72.5	71.6	73.5	70.5	63.9	28.1	8.0	2,462
Primary (1-5)	94.1	93.9	95.9	91.6	90.2	87.2	90.8	88.1	88.1	84.8	85.1	82.3	82.0	85.6	81.0	71.4	25.7	2.9	349

Middle (6-8)	94.9	95.7	95.8	92.8	92.0	89.6	93.7	90.8	90.6	85.6	88.6	84.2	83.0	86.4	85.6	76.0	20.9	3.1	495
Secondary (9-10)	98.6	98.1	98.0	97.9	97.6	93.9	94.8	95.0	95.1	89.3	89.4	91.2	89.9	92.1	89.9	82.8	15.9	1.4	963
Higher (11 and above)	99.5	99.1	99.2	98.7	98.5	95.3	96.8	97.5	96.6	92.0	93.0	93.4	92.0	95.6	93.6	83.8	15.8	0.4	1,214
Residence																			
Rural	92.8	94.0	93.8	89.3	88.9	85.3	89.7	86.5	86.2	81.5	85.2	82.1	81.3	83.4	81.4	74.3	21.4	4.3	4,821
Urban	94.4	93.2	94.8	91.3	90.3	87.5	90.8	88.0	86.7	82.6	82.3	82.6	80.1	85.1	80.4	68.4	26.9	4.7	662
Wealth Quintiles																			
Poorest	86.7	89.3	90.7	80.4	80.1	77.9	85.2	76.5	75.9	73.1	78.5	70.8	69.6	72.8	70.9	62.9	29.6	7.4	730
Poor	90.5	91.8	91.9	86.6	86.2	82.0	87.3	83.3	83.0	78.1	82.2	78.9	78.3	80.4	76.3	70.4	23.8	5.8	1,892
Middle	94.6	95.4	94.7	91.6	90.7	87.8	90.6	88.6	88.6	83.5	86.9	85.4	83.0	86.6	84.2	76.2	20.3	3.5	1,600
Rich	97.6	97.0	97.5	95.7	95.6	91.3	94.3	94.1	93.3	87.9	88.5	87.9	87.6	89.2	88.5	78.8	19.3	1.9	897
Richest	97.5	95.6	96.2	95.1	94.2	91.4	94.1	92.4	91.1	88.3	86.8	87.4	87.7	90.5	88.3	77.3	20.3	2.4	364
Districts																			
GILGIT	93.1	92.6	92.0	90.2	89.0	87.2	90.1	86.3	85.8	82.4	81.4	79.1	76.8	82.0	78.9	65.3	28.8	5.9	769
GHIZER	98.7	99.3	98.9	98.9	98.9	94.9	93.3	98.5	98.5	93.5	92.2	96.0	96.0	95.5	94.0	88.7	10.6	0.7	838
HUNZA	100.0	100.0	98.9	99.5	99.4	92.9	96.5	99.6	99.1	90.4	95.9	98.1	97.8	97.1	98.3	92.9	7.1	0.0	404
NAGAR	99.0	99.3	98.0	98.2	98.2	94.7	94.8	97.3	97.3	93.5	93.7	96.9	95.7	96.7	94.7	90.2	9.0	0.7	420
GHANCHE	99.9	99.7	99.9	99.8	99.6	99.7	99.5	99.4	99.0	96.7	98.4	98.3	98.0	98.3	94.2	92.8	7.2	0.1	622
BALTISTAN	96.9	95.6	96.5	96.0	95.5	93.4	94.3	94.0	93.9	91.5	91.7	90.8	90.6	93.3	86.2	81.1	16.3	2.5	809
SHIGAR	100.0	100.0	99.7	99.7	99.7	97.5	99.7	99.7	99.7	97.5	99.7	99.2	99.5	100.0	98.6	97.2	2.8	0.0	403
KHARMANG	99.5	98.8	98.4	96.3	95.5	78.4	97.3	96.2	95.8	76.9	96.4	95.0	93.8	96.1	93.2	88.9	11.1	0.0	410
DIAMIR	71.6	77.9	79.3	55.7	55.8	51.9	64.7	47.8	46.7	43.2	54.1	39.5	39.3	41.6	42.8	35.1	49.4	15.5	545
ASTORE	90.8	92.2	94.0	87.1	85.4	77.8	90.5	79.9	78.9	68.2	76.0	69.6	64.5	73.4	72.0	51.2	44.3	4.4	263

[1] All vaccines from birth to 9 months (excluding RV)

Table 25. Demographic characteristics - AJK

Level	Clusters Sampled	Households					Children 12-23 months			Wealth Quintiles			% literate[1]	
		Target	Randomized	Completed	Response rate	Household size, mean ± sd	N	Age in months (mean ± sd)	% male children	Too Poorest	Middle	Too Richest	Mothers	Fathers
AZAD JAMMU & KASHMIR	**580**	**7,540**	**7,540**	**7,462**	**99.0**	**7.4 ± 3.5**	**7,547**	**17.8 ± 3.3**	**52.6**	**14.3**	**22.7**	**63.0**	**79.9**	**88.6**
MUZAFFARABAD	64	832	832	797	95.8	7.6 ± 3.6	813	17.7 ± 3.3	50.1	16.0	19.9	64.1	71.9	87.0
NEELUM	49	637	637	637	100.0	6.7 ± 3.4	648	17.5 ± 3.1	51.5	30.8	48.9	20.4	37.5	67.7
HATTIAN BALA	49	637	637	635	99.7	7.3 ± 3.2	639	17.5 ± 3.2	53.2	38.0	24.9	37.0	59.9	82.4
BAGH	64	832	832	825	99.2	7.1 ± 3.7	844	17.7 ± 3.3	51.9	6.2	34.4	59.4	90.8	94.4
SUDHNOTI	49	637	637	634	99.5	7.1 ± 2.9	634	17.9 ± 3.3	50.4	14.7	26.6	58.7	90.1	96.9
POONCH	64	832	832	830	99.8	7.1 ± 3.5	840	17.8 ± 3.2	51.2	12.7	28.7	58.6	89.0	90.6
HAVELI	49	637	637	636	99.8	7.1 ± 3.2	638	18.2 ± 3.0	51.2	62.2	25.2	12.5	62.1	82.8
BHIMBER	64	832	832	826	99.3	8.0 ± 3.9	830	17.7 ± 3.5	52.0	2.6	9.7	87.8	91.1	94.5
MIRPUR	64	832	832	814	97.8	7.2 ± 3.3	820	17.8 ± 3.5	52.4	8.7	8.0	83.3	83.6	85.2
KOTLI	64	832	832	828	99.5	7.8 ± 3.6	841	18.0 ± 3.5	57.6	7.1	20.2	72.7	82.0	88.8
[1] 1 or more years of education														

Table 26. Vaccination status – AJK

	Birth		6 weeks				10 weeks				14 weeks				9 months	Fully vaccinated[1]	Partially vaccinated	Not vaccinated	Total children
	BCG	OPV0	OPV 1	Penta 1	PCV 1	RV 1	OPV 2	Penta 2	PCV 2	RV 2	OPV 3	Penta 3	PCV 3	IPV	MCV 1				
AJK	**98.9**	**98.8**	**98.7**	**98.6**	**98.6**	**98.1**	**97.6**	**97.9**	**97.9**	**97.4**	**93.0**	**95.4**	**95.6**	**95.9**	**93.2**	**88.8**	**10.2**	**1.0**	**7,547**
Sex of Child																			
Male	99.2	99.2	99.0	98.9	98.9	98.5	98.0	98.4	98.4	98.0	93.5	96.1	96.1	96.4	93.4	89.3	10.0	0.7	3,944
Female	98.6	98.4	98.4	98.2	98.2	97.7	97.1	97.4	97.4	96.8	92.5	94.7	95.1	95.4	92.9	88.3	10.4	1.3	3,603
Source																			
Card	99.9	99.9	99.8	99.8	99.8	99.3	99.1	99.1	99.1	98.5	97.8	97.7	97.7	97.5	94.7	94.0	6.0	0.0	5,802
Recall	95.7	95.3	95.1	94.5	94.5	94.4	92.6	94.2	94.2	93.8	77.8	88.0	88.8	90.7	88.3	72.3	23.5	4.2	1,745
Maternal years of education																			
None	97.0	96.8	96.5	96.2	96.1	95.8	93.2	94.7	94.6	94.2	86.3	89.9	89.7	90.2	85.4	79.6	17.6	2.9	1,755
Primary (1-5)	99.5	99.5	99.4	99.4	99.3	99.0	98.6	98.8	98.8	98.4	93.3	96.1	96.5	97.0	94.8	89.2	10.3	0.5	1,385
Middle (6-8)	99.2	99.1	98.8	98.4	98.5	98.0	98.4	98.1	98.2	97.3	94.4	95.4	95.9	96.2	92.7	89.2	10.2	0.6	1,254
Secondary (9-10)	99.4	99.3	99.3	99.2	99.2	98.6	98.5	98.7	98.7	98.0	95.5	97.2	97.3	97.4	95.5	92.5	6.9	0.6	1,514
Higher (11 and above)	99.4	99.3	99.5	99.5	99.5	99.2	99.0	99.3	99.3	99.0	95.5	98.3	98.2	98.5	96.8	93.0	6.6	0.4	1,639
Residence																			
Rural	99.0	98.8	98.8	98.7	98.7	98.3	97.7	98.2	98.2	97.7	93.5	95.6	95.8	96.1	93.8	89.6	9.5	0.9	6,626
Urban	98.6	98.6	98.3	98.0	98.0	97.6	97.1	96.9	96.9	96.2	90.8	94.7	95.0	95.0	90.4	85.3	13.3	1.4	921
Wealth Quintiles																			
Poorest	93.4	92.5	92.5	91.6	91.5	90.9	88.9	89.7	89.5	88.5	78.3	84.6	84.6	85.8	79.6	69.2	24.4	6.4	365
Poor	97.8	97.4	97.5	97.2	97.2	96.2	94.4	96.3	96.2	95.2	88.6	91.0	90.9	91.1	87.0	82.4	15.7	1.9	995
Middle	98.8	98.7	98.7	98.6	98.7	97.9	97.3	97.7	97.8	97.0	93.7	95.1	95.2	95.6	92.0	88.3	10.6	1.1	1,848
Rich	99.5	99.4	99.2	99.0	99.0	98.8	98.6	98.6	98.7	98.3	94.0	96.4	96.8	97.0	94.8	90.5	8.9	0.5	2,941
Richest	99.4	99.4	99.5	99.5	99.5	99.3	98.8	98.9	98.9	98.8	95.1	97.8	97.9	98.2	96.4	92.5	7.1	0.4	1,398
Districts																			
MUZAFFARABAD	98.1	98.0	98.0	97.5	97.6	97.0	97.3	96.9	96.9	96.2	77.2	93.1	92.4	94.0	89.4	71.0	27.4	1.6	813
NEELUM	99.5	99.5	99.0	98.9	98.9	98.1	88.0	98.3	98.3	97.6	85.3	87.2	87.5	88.1	83.5	80.1	19.4	0.5	648
HATTIAN BALA	96.6	96.3	95.7	95.1	95.2	94.0	93.7	93.8	93.8	92.8	91.0	91.0	91.7	92.4	85.5	81.7	14.9	3.4	639
BAGH	99.1	99.1	98.9	98.9	98.9	98.9	98.2	98.2	98.2	98.2	96.8	96.3	96.7	96.9	93.7	92.7	6.3	0.9	844
SUDHNOTI	99.6	99.6	99.5	99.5	99.5	99.3	99.0	99.0	99.0	98.9	98.0	98.0	98.0	97.9	94.9	94.7	4.9	0.4	634
POONCH	98.6	98.0	98.5	98.5	98.5	96.8	97.4	97.4	97.4	95.2	95.7	95.5	95.7	94.9	93.1	90.4	8.2	1.3	840
HAVELI	98.1	97.4	98.1	97.5	97.3	97.3	97.2	97.2	97.1	97.1	92.2	92.2	90.5	92.3	87.4	84.9	13.4	1.7	638
BHIMBER	99.5	99.5	99.5	99.5	99.5	99.5	98.9	98.9	98.9	98.9	98.6	98.3	98.6	98.6	97.2	97.0	2.5	0.5	830
MIRPUR	99.8	99.8	99.5	99.5	99.5	99.3	98.7	98.7	98.7	98.5	97.8	97.8	97.8	97.6	97.5	96.7	3.2	0.2	820
KOTLI	99.4	99.4	99.3	99.3	99.3	99.3	99.1	99.1	99.1	99.1	98.2	97.2	98.2	98.2	96.9	95.5	4.1	0.5	841

[1] All vaccines from birth to 9 months (excluding RV)

Table 27. Demographic characteristics - Islamabad

Level	Clusters Sampled	Households					Children 12-23 months			Wealth Quintiles			% literate[1]	
		Target	Randomized	Completed	Response rate	Household size, mean ± sd	N	Age in months (mean ± sd)	% male children	Too Poorest	Middle	Too Richest	Mothers	Fathers
ISLAMABAD	113	1,469	1,468	1,439	98.0	6.8 ± 3.0	1,458	17.8 ± 3.4	48.9	5.1	5.9	89.0	74.8	82.7

[1] 1 or more years of education

Table 28. Vaccination status – Islamabad

	Birth		6 weeks				10 weeks				14 weeks				9 months	Fully vaccinated[1]	Partially vaccinated	Not vaccinated	Total children
	BCG	OPV0	OPV 1	Penta 1	PCV 1	RV 1	OPV 2	Penta 2	PCV 2	RV 2	OPV 3	Penta 3	PCV 3	IPV	MCV 1				
ISLAMABAD	96.9	96.0	94.5	94.0	93.8	92.6	85.5	92.2	91.8	90.8	80.4	86.3	86.2	88.1	81.7	70.8	26.3	2.9	1458
Sex of Child																			
Male	95.1	94.2	93.4	92.4	92.4	91.0	84.7	91.0	90.5	89.6	78.5	85.0	83.3	85.8	79.0	69.4	25.8	4.8	766
Female	98.5	97.7	95.7	95.5	95.1	94.2	86.3	93.4	93.2	92.0	82.1	87.5	89.0	90.3	84.2	72.0	26.7	1.2	692
Source																			
Card	99.8	99.6	98.2	98.2	98.2	97.5	95.9	95.9	95.9	95.4	92.1	92.2	92.2	91.7	82.3	81.2	18.8	0.0	908
Recall	92.2	90.1	88.6	87.2	86.6	84.8	68.7	86.3	85.3	83.4	61.4	76.8	76.5	82.2	80.5	53.9	38.4	7.7	550
Maternal years of education																			
None	91.7	88.8	86.3	84.7	84.8	82.3	77.0	79.9	80.0	77.6	69.5	67.9	71.9	73.9	66.1	57.1	35.1	7.8	312
Primary (1-5)	97.2	96.4	94.3	94.1	92.9	91.8	82.2	88.9	87.1	87.3	77.4	83.6	81.9	83.7	73.4	66.0	32.0	2.1	133
Middle (6-8)	95.8	94.9	94.9	94.6	92.8	92.5	89.7	93.4	92.2	92.0	84.7	88.3	87.2	87.8	83.2	75.2	20.6	4.2	109
Secondary (9-10)	98.1	97.9	96.9	96.9	96.9	96.3	90.2	96.9	96.5	95.4	83.7	90.9	88.4	91.7	83.3	74.6	23.5	1.9	241
Higher (11 and above)	99.6	99.6	98.4	98.2	98.2	97.5	88.5	98.1	97.8	97.3	85.2	95.6	94.4	95.9	91.5	77.3	22.2	0.4	663
Residence																			
Rural	95.3	94.5	93.3	92.6	92.1	90.4	83.7	91.0	90.5	88.8	80.4	86.2	87.0	88.0	84.8	71.8	23.7	4.5	631
Urban	98.6	97.5	95.8	95.5	95.6	95.0	87.4	93.6	93.3	93.0	80.3	86.4	85.3	88.1	78.3	69.6	29.1	1.3	827
Wealth Quintiles																			
Poorest	100.0	95.1	81.1	81.1	81.1	81.1	57.5	57.5	57.5	57.5	48.0	48.0	48.0	50.9	26.9	26.9	73.1	0.0	25
Poor	96.2	94.7	88.9	87.4	87.4	84.4	80.8	82.5	82.5	78.3	64.2	65.9	63.8	67.3	60.8	55.6	41.4	3.1	46
Middle	95.8	92.0	89.0	89.0	89.0	87.2	79.9	83.8	83.8	83.1	64.7	68.6	68.6	70.3	63.6	59.7	36.1	4.2	100
Rich	97.4	95.2	93.2	93.3	93.5	90.8	86.6	91.2	90.9	89.0	82.3	81.4	86.4	88.2	79.5	68.5	29.2	2.3	243
Richest	96.8	96.6	95.9	95.2	94.8	94.2	86.5	94.4	94.0	93.3	82.7	90.9	89.5	91.3	85.9	74.0	23.0	3.1	1044

[1] All vaccines from birth to 9 months (excluding RV)

Figure 12. Vaccination coverage and timeliness: National
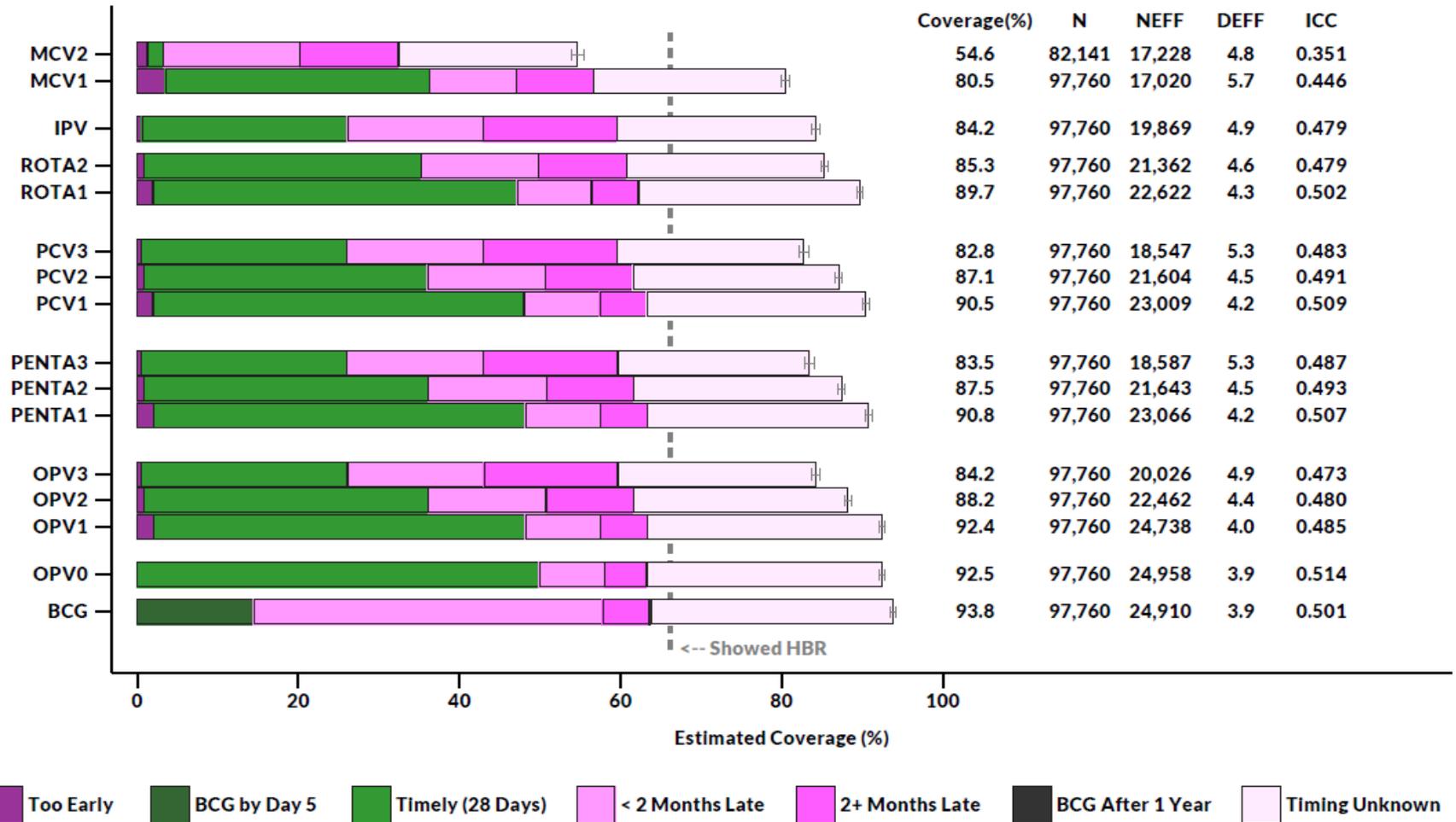
Figure 13. Vaccination coverage and timeliness: Punjab

	Coverage(%)	N	NEFF	DEFF	ICC
MCV2	67.4	19,750	6,834	2.9	0.100
MCV1	92.6	24,037	4,368	5.5	0.135
IPV	95.4	24,037	6,274	3.8	0.126
ROTA2	95.6	24,037	7,581	3.2	0.099
ROTA1	97.6	24,037	7,744	3.1	0.076
PCV3	94.5	24,037	4,990	4.8	0.133
PCV2	96.8	24,037	7,080	3.4	0.089
PCV1	98.2	24,037	6,994	3.4	0.076
PENTA3	94.9	24,037	4,957	4.8	0.130
PENTA2	97.1	24,037	7,556	3.2	0.089
PENTA1	98.3	24,037	7,215	3.3	0.073
OPV3	95.0	24,037	5,817	4.1	0.134
OPV2	97.3	24,037	7,399	3.2	0.089
OPV1	98.6	24,037	6,882	3.5	0.074
OPV0	98.5	24,037	7,282	3.3	0.064
BCG	99.2	24,037	6,513	3.7	0.056

<-- Showed HBR

Legend: Too Early · BCG by Day 5 · Timely (28 Days) · < 2 Months Late · 2+ Months Late · BCG After 1 Year · Timing Unknown

Abbreviations: HBR: Home-based record NEFF: Effective sample size DEFF: Design effect ICC: Intracluster correlation coefficient

Figure 14. Vaccination coverage and timeliness: Sindh

	Coverage(%)	N	NEFF	DEFF	ICC
MCV2	40.4	18,593	6,169	3.0	0.161
MCV1	67.2	23,290	4,714	4.9	0.249
IPV	73.7	23,290	5,068	4.6	0.278
ROTA2	76.2	23,290	5,291	4.4	0.269
ROTA1	84.6	23,290	5,186	4.5	0.263
PCV3	71.5	23,290	4,901	4.7	0.278
PCV2	79.2	23,290	5,009	4.6	0.273
PCV1	85.8	23,290	4,985	4.7	0.268
PENTA3	73.2	23,290	5,204	4.5	0.280
PENTA2	79.7	23,290	4,995	4.7	0.273
PENTA1	86.3	23,290	4,987	4.7	0.261
OPV3	75.0	23,290	5,403	4.3	0.268
OPV2	81.4	23,290	5,234	4.4	0.261
OPV1	89.1	23,290	5,334	4.4	0.250
OPV0	90.9	23,290	4,871	4.8	0.234
BCG	92.5	23,290	4,820	4.8	0.232

<-- Showed HBR

Estimated Coverage (%)

Legend: Too Early | BCG by Day 5 | Timely (28 Days) | < 2 Months Late | 2+ Months Late | BCG After 1 Year | Timing Unknown

Abbreviations: HBR: Home-based record NEFF: Effective sample size DEFF: Design effect ICC: Intracluster correlation coefficient

Figure 15. Vaccination coverage and timeliness: Balochistan

	Coverage(%)	N	NEFF	DEFF	ICC
MCV2	13.0	23,131	2,810	8.2	0.373
MCV1	42.7	25,764	1,762	14.6	0.478
IPV	44.7	25,764	1,852	13.9	0.481
ROTA2	46.4	25,764	1,836	14.0	0.482
ROTA1	53.0	25,764	1,981	13.0	0.519
PCV3	42.0	25,764	1,800	14.3	0.489
PCV2	47.4	25,764	1,874	13.7	0.483
PCV1	53.5	25,764	2,000	12.9	0.517
PENTA3	42.2	25,764	1,782	14.4	0.489
PENTA2	47.7	25,764	1,854	13.9	0.485
PENTA1	54.2	25,764	1,988	12.9	0.516
OPV3	45.3	25,764	1,956	13.2	0.476
OPV2	51.0	25,764	2,101	12.2	0.472
OPV1	63.1	25,764	2,031	12.7	0.503
OPV0	58.0	25,764	2,281	11.3	0.513
BCG	63.1	25,764	2,122	12.1	0.490

Legend: Too Early | BCG by Day 5 | Timely (28 Days) | < 2 Months Late | 2+ Months Late | BCG After 1 Year | Timing Unknown

Abbreviations: HBR: Home-based record NEFF: Effective sample size DEFF: Design effect ICC: Intracluster correlation coefficient

Figure 16. Vaccination coverage and timeliness: KP

Vaccine	Coverage(%)	N	NEFF	DEFF	ICC
MCV2	48.6	14,800	3,575	4.1	0.231
MCV1	73.1	17,432	3,652	4.8	0.291
IPV	75.9	17,432	3,609	4.8	0.315
ROTA2	77.7	17,432	3,547	4.9	0.329
ROTA1	83.2	17,432	3,971	4.4	0.328
PCV3	73.7	17,432	3,482	5.0	0.328
PCV2	79.3	17,432	3,514	5.0	0.331
PCV1	83.9	17,432	4,283	4.1	0.320
PENTA3	74.3	17,432	3,457	5.0	0.328
PENTA2	79.8	17,432	3,451	5.0	0.329
PENTA1	84.6	17,432	4,184	4.2	0.316
OPV3	75.3	17,432	3,393	5.1	0.323
OPV2	80.5	17,432	3,536	4.9	0.323
OPV1	86.7	17,432	4,603	3.8	0.306
OPV0	85.9	17,432	4,744	3.7	0.326
BCG	88.0	17,432	4,626	3.8	0.312

<-- Showed HBR

Estimated Coverage (%)

Legend: Too Early | BCG by Day 5 | Timely (28 Days) | < 2 Months Late | 2+ Months Late | BCG After 1 Year | Timing Unknown

Abbreviations: HBR: Home-based record NEFF: Effective sample size DEFF: Design effect ICC: Intracluster correlation coefficient

Figure 17. Vaccination coverage and timeliness: KP-NMD

	Coverage(%)	N	NEFF	DEFF	ICC
MCV2	28.8	4,673	683	6.8	0.239
MCV1	49.5	5,779	620	9.3	0.367
IPV	51.3	5,779	605	9.5	0.420
ROTA2	53.4	5,779	614	9.4	0.446
ROTA1	59.2	5,779	553	10.4	0.503
PCV3	49.5	5,779	609	9.4	0.427
PCV2	53.7	5,779	619	9.3	0.454
PCV1	59.0	5,779	580	9.9	0.506
PENTA3	49.6	5,779	598	9.6	0.425
PENTA2	54.0	5,779	608	9.4	0.451
PENTA1	59.8	5,779	578	9.9	0.505
OPV3	51.2	5,779	611	9.4	0.422
OPV2	55.1	5,779	615	9.3	0.451
OPV1	61.6	5,779	522	11.0	0.517
OPV0	58.3	5,779	535	10.7	0.514
BCG	63.5	5,779	569	10.1	0.577

<-- Showed HBR

Estimated Coverage (%)

Legend: Too Early | BCG by Day 5 | Timely (28 Days) | < 2 Months Late | 2+ Months Late | BCG After 1 Year | Timing Unknown

Abbreviations: HBR: Home-based record NEFF: Effective sample size DEFF: Design effect ICC: Intracluster correlation coefficient

Figure 18. Vaccination coverage and timeliness: Islamabad

	Coverage(%)	N	NEFF	DEFF	ICC
MCV2	48.4	1,194	220	5.3	0.091
MCV1	81.8	1,458	336	4.2	0.126
IPV	88.1	1,458	534	2.7	0.162
ROTA2	90.8	1,458	762	1.9	0.124
ROTA1	93.1	1,458	856	1.7	0.090
PCV3	86.2	1,458	447	3.2	0.158
PCV2	92.1	1,458	950	1.5	0.093
PCV1	94.1	1,458	906	1.6	0.077
PENTA3	86.3	1,458	635	2.2	0.163
PENTA2	92.5	1,458	959	1.5	0.090
PENTA1	94.5	1,458	910	1.6	0.067
OPV3	80.4	1,458	263	5.4	0.134
OPV2	85.9	1,458	341	4.2	0.113
OPV1	95.1	1,458	817	1.7	0.065
OPV0	96.0	1,458	683	2.1	0.054
BCG	96.9	1,458	499	2.9	0.033

<-- Showed HBR

Estimated Coverage (%)

Legend: Too Early | BCG by Day 5 | Timely (28 Days) | < 2 Months Late | 2+ Months Late | BCG After 1 Year | Timing Unknown
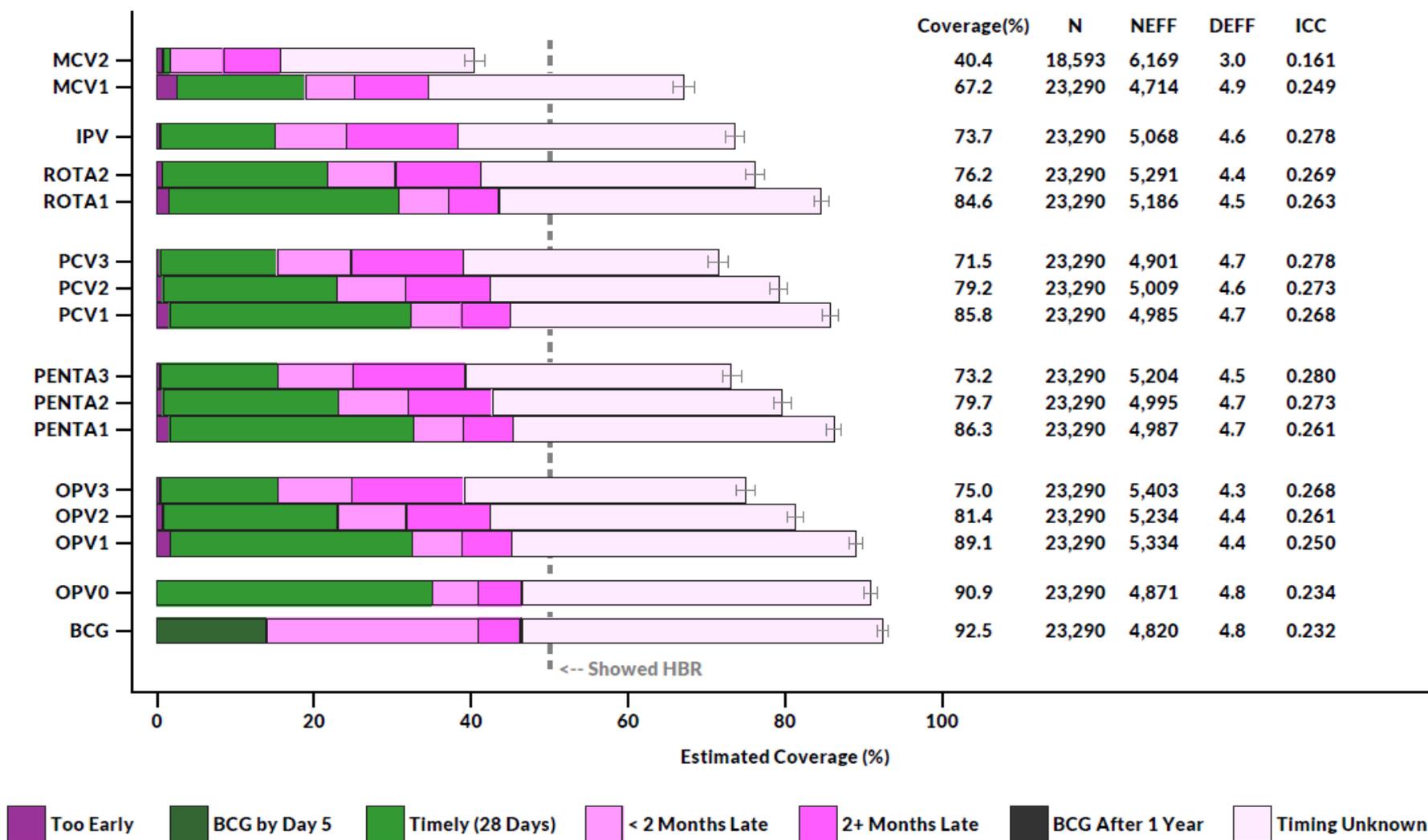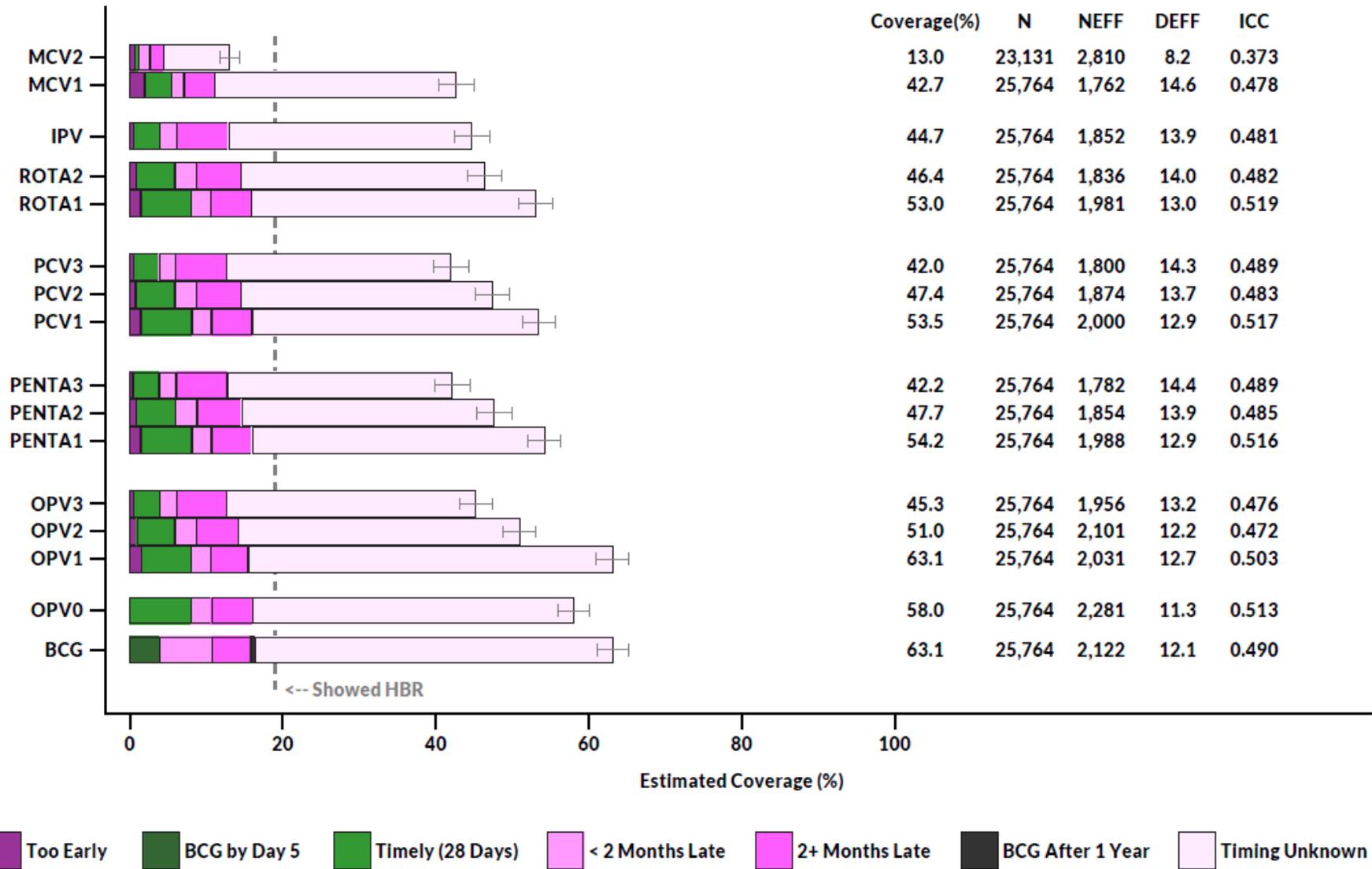
Abbreviations: HBR: Home-based record NEFF: Effective sample size DEFF: Design effect ICC: Intracluster correlation coefficient

Figure 19. Vaccination coverage and timeliness: AJK

	Coverage(%)	N	NEFF	DEFF	ICC
MCV2	69.6	6,443	3,255	2.0	0.071
MCV1	93.2	7,547	3,331	2.3	0.117
IPV	95.9	7,547	3,341	2.2	0.120
ROTA2	97.4	7,547	3,828	2.0	0.072
ROTA1	98.2	7,547	3,225	2.3	0.091
PCV3	95.6	7,547	3,399	2.2	0.125
PCV2	97.9	7,547	3,549	2.1	0.074
PCV1	98.6	7,547	2,884	2.6	0.104
PENTA3	95.4	7,547	3,353	2.2	0.124
PENTA2	97.9	7,547	3,550	2.1	0.075
PENTA1	98.6	7,547	2,920	2.6	0.098
OPV3	93.0	7,547	1,862	4.0	0.174
OPV2	97.6	7,547	3,664	2.1	0.171
OPV1	98.9	7,547	3,453	2.2	0.087
OPV0	98.8	7,547	2,941	2.6	0.111
BCG	98.9	7,547	3,185	2.4	0.080

<-- Showed HBR

Estimated Coverage (%)

Legend: Too Early | BCG by Day 5 | Timely (28 Days) | < 2 Months Late | 2+ Months Late | BCG After 1 Year | Timing Unknown

Abbreviations: HBR: Home-based record NEFF: Effective sample size DEFF: Design effect ICC: Intracluster correlation coefficient
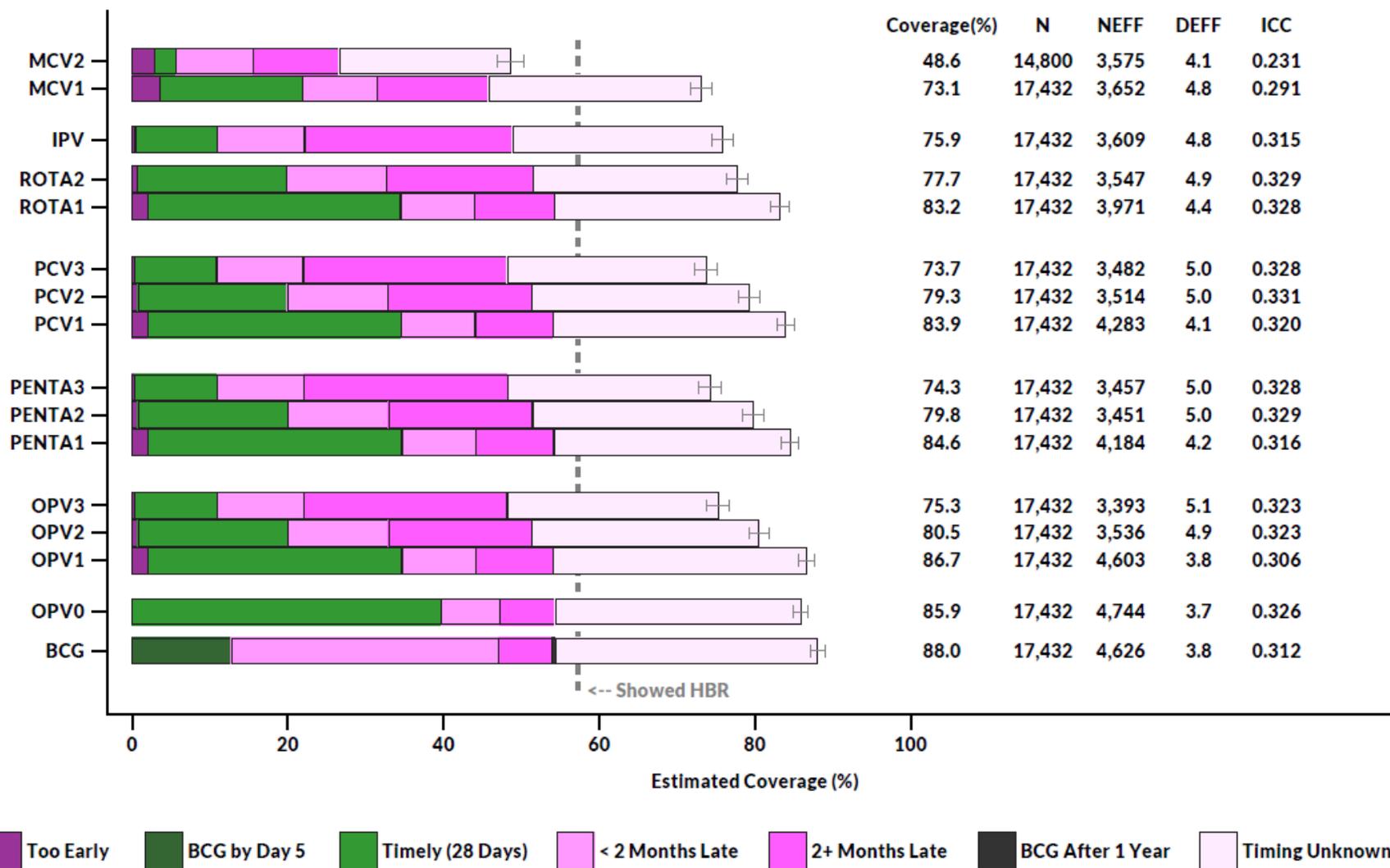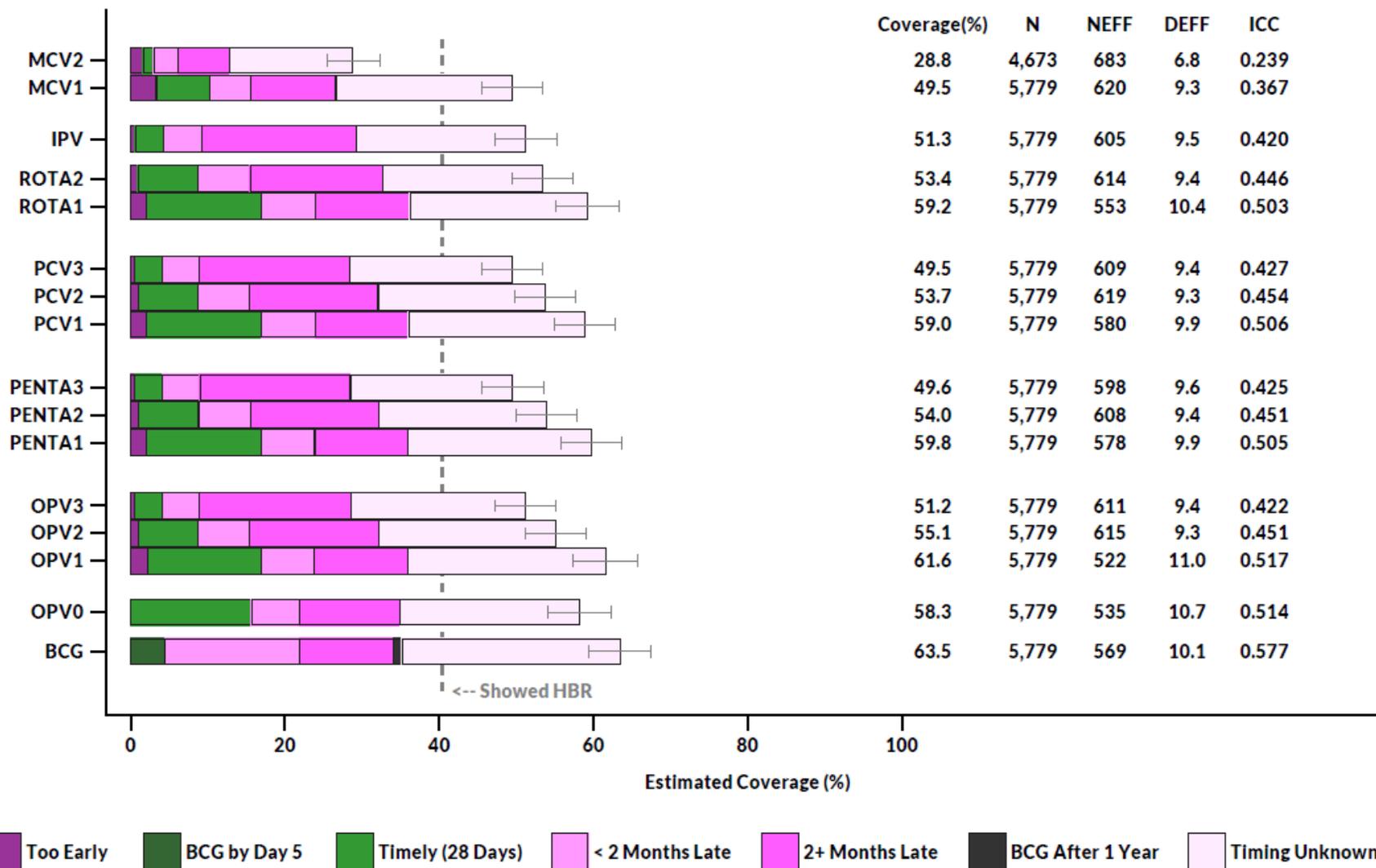
Figure 20. Vaccination coverage and timeliness: GB
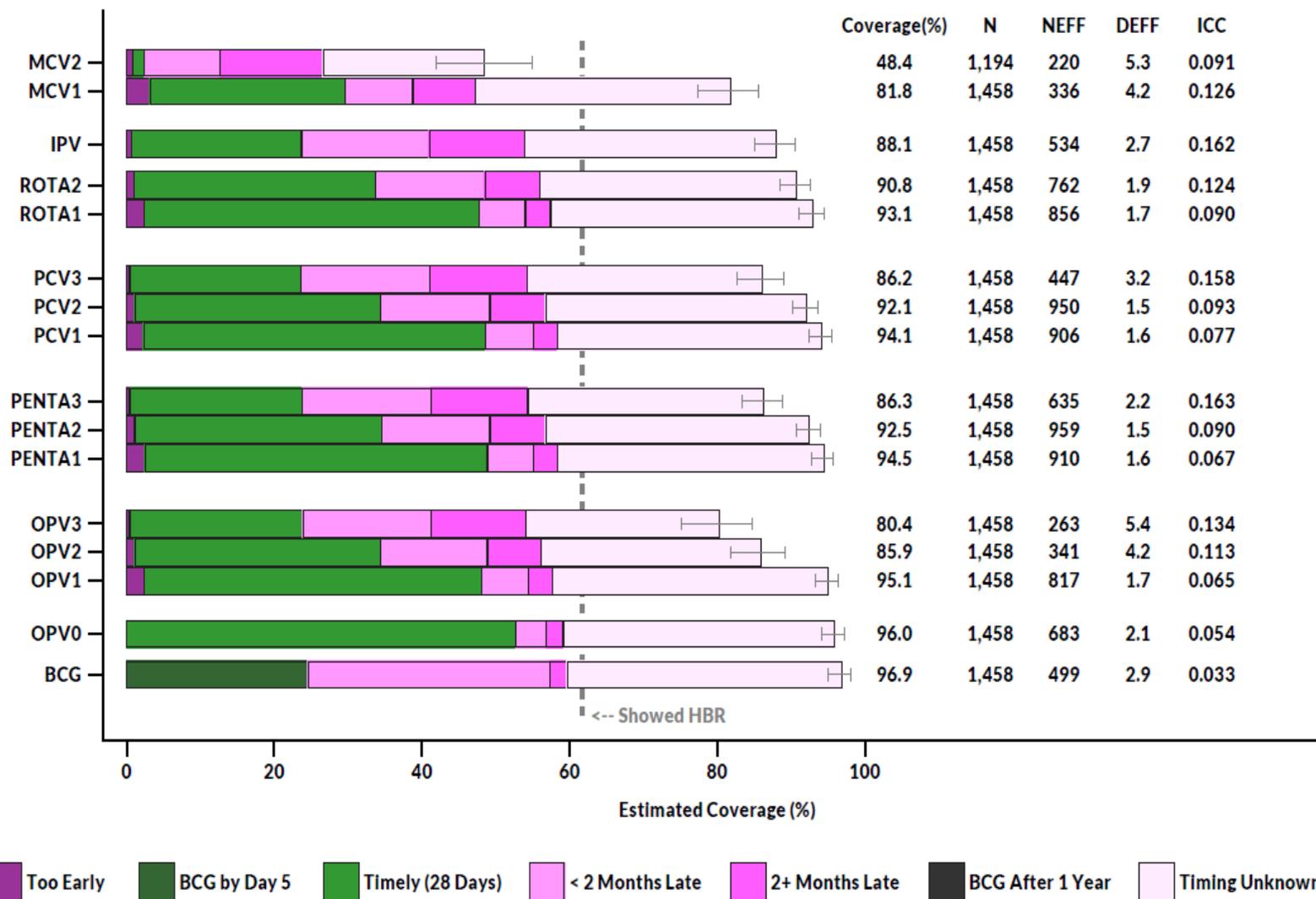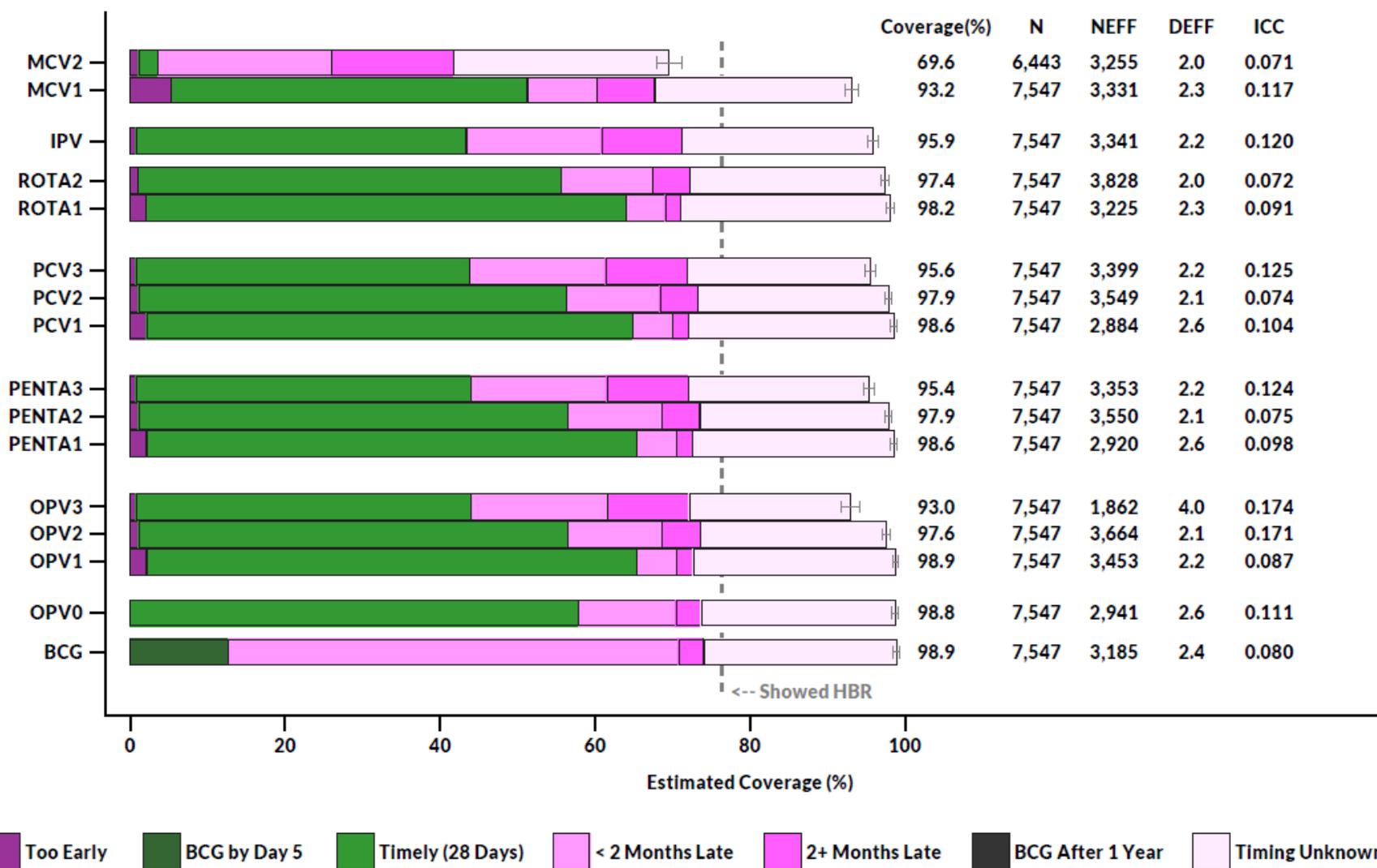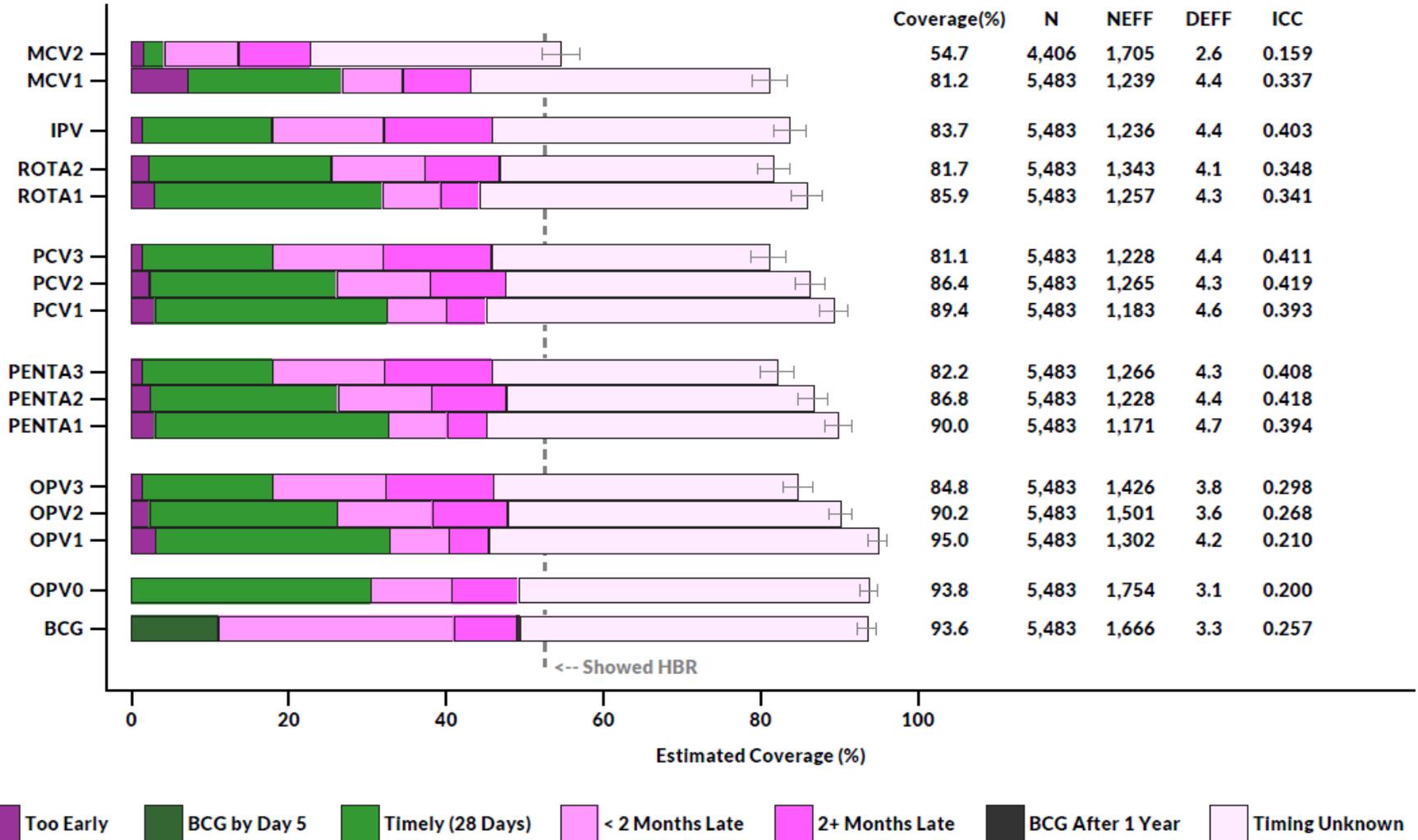

	Coverage(%)	N	NEFF	DEFF	ICC
MCV2	54.7	4,406	1,705	2.6	0.159
MCV1	81.2	5,483	1,239	4.4	0.337
IPV	83.7	5,483	1,236	4.4	0.403
ROTA2	81.7	5,483	1,343	4.1	0.348
ROTA1	85.9	5,483	1,257	4.3	0.341
PCV3	81.1	5,483	1,228	4.4	0.411
PCV2	86.4	5,483	1,265	4.3	0.419
PCV1	89.4	5,483	1,183	4.6	0.393
PENTA3	82.2	5,483	1,266	4.3	0.408
PENTA2	86.8	5,483	1,228	4.4	0.418
PENTA1	90.0	5,483	1,171	4.7	0.394
OPV3	84.8	5,483	1,426	3.8	0.298
OPV2	90.2	5,483	1,501	3.6	0.268
OPV1	95.0	5,483	1,302	4.2	0.210
OPV0	93.8	5,483	1,754	3.1	0.200
BCG	93.6	5,483	1,666	3.3	0.257

Legend: Too Early, BCG by Day 5, Timely (28 Days), < 2 Months Late, 2+ Months Late, BCG After 1 Year, Timing Unknown

Abbreviations: HBR: Home-based record NEFF: Effective sample size DEFF: Design effect ICC: Intracluster correlation coefficient